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Automation

2017 / 2018

PHOENIX CONTACT
INSPIRING INNOVATIONS

Automation

Terminal blocks

- Terminal blocks

Sensor/actuator cabling and connectors

- Sensor/actuator cabling
- Cables and lines
- Connectors

Marking systems, tools and mounting material

- Marking and labeling
- Tools
- Installation and mounting material

Power supplies, surge protection and device circuit breakers

- Surge protection and interference suppression filters
- Power supplies and UPS
- Protective devices

Interface technology and switching devices

- Electronic switching devices and motor control
- Measurement and control technology
- Monitoring
- Relay modules
- System cabling for controllers

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PROFI
CLOUD

Industrial cloud computing

Industrial cloud computing represents digital and Internet-based processes, and connects systems, people, and companies.

With Proficloud, Phoenix Contact is offering a uniform cloud solution tailored to your requirements for state-of-the-art automation. Simply use our cloud devices, the corresponding platform, and the desired cloud services.

As an open IoT platform, Proficloud can be used to set up flexible, optimized processes and integrate third-party applications. You can therefore benefit from needs-based scalability and pay-per-use payment. This lets you utilize all the advantages and freedom during your transition into the digital age.

Make the right decisions today for your future and join us in the world of Proficloud.

Professional cloud solutions for industry

Cloud device controller **7**
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Cloud software development kit **8**
Cloud runtime **9**
Cloud services **9**

Cloud system for PROFINET

Proficloud expands the PROFINET communication standard with the unlimited possibilities of the Internet, thereby simplifying distributed communication significantly.

Network devices – whether they are distributed on a local, regional or global scale – and even information from the Internet can be added easily and securely from Proficloud to the local PROFINET network. This opens up numerous new possibilities for automation solutions based on PROFINET.

Integrate information from cloud services into your application or intelligently outsource tasks that require considerable processor power to central processing units in Proficloud. Using the software development kit (SDK), you can develop your own applications with ease.

The TLS (Transport Layer Security) encryption protocol ensures that your data remains secure.

The cloud system for PROFINET for worldwide industrial communication consists of a cloud coupler, cloud controller, cloud runtime, and cloud services.

Proficloud is quick and easy to install: at distributed locations you can install cloud controllers that connect to Proficloud via the Internet. At local sites, the cloud coupler extends the PROFINET network with Proficloud functionalities. The distributed cloud controllers then appear as local PROFINET devices. Everything is completely transparent and requires no further configuration or programming.

Your advantages:

- The PROFINET network can be extended to include cloud services, without requiring any further specialist knowledge
- Maximum flexibility, thanks to unlimited automation via the Internet
- Easy engineering, as distributed devices and cloud services appear in the local PROFINET network
- Efficient automation thanks to preconfigured and preprogrammed Proficloud products
- Secure communication, thanks to TLS encryption

Cloud device controller

The cloud controller is based on the modular Axiocontrol controller. It is connected to the Internet and links to Proficloud.

Features:

- Cloud controller for decentralized use of I/Os
- Numerous protocols supported such as: http, https, FTP, SNTP, SNMP, SMTP, SQL, MySQL, DCP, etc.
- Free engineering with PC Worx Express (IEC 61131-3)
- Up to 63 AXIO I/O modules can be mounted side by side
- Integrated UPS for targeted shutdown of the application
- Configuration via USB
- Web server HTML5 and Java
- SD card up to 2 GB as optional plug-in parameterization memory
- 2 x Ethernet interfaces (integrated switch)
- Increased resistance to EMI

Cloud controller

Technical data

Interfaces		
Axioline F local bus		Bus base module
Ethernet		1 x RJ45 socket
USB 2.0		1 x Micro USB type B
AXIOBUS master		
Number of supported devices		63
IEC-61131 runtime system		
Programming tool		PC WORX
Processor		Altera Nios II 100 MHz
Processing speed		1.3 ms (1 K mix instructions) 90 µs (1 K bit instructions)
Program memory		1 Mbyte
Mass storage		1 Mbyte
Retentive mass storage		48 kbyte (NVRAM)
Number of control tasks		8
Realtime clock		Yes
Power supply		
Supply voltage		24 V DC
Supply voltage range		19.2 V DC ... 30 V DC
Typical current consumption		125 mA
General data		
Dimensions	W / H / D	45 mm / 125.9 mm / 74 mm
Degree of protection		IP20
Ambient temperature (operation)		-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axiocontrol for communication with Proficloud, for direct control of Axioline I/Os, with 2 Ethernet interfaces, programming options according to IEC 61131-3, complete with connector and marking field	**AXC CLOUD-PRO**	2402985	1

Accessories

Parameterization memory, flash card without license			
- 2 GB	**SD FLASH 2GB**	2988162	1
- 512 MB	**SD FLASH 512MB**	2988146	1
- 2 GB	**SD FLASH 2GB APPLIC A**	2701190	1
- 512 MB	**SD FLASH 512MB APPLIC A**	2701799	1
Programming cable			
	CAB-USB A/MICRO USB B/2,0M	2701626	1

Function modules — **See page 91**

Cloud device coupler

The cloud coupler securely connects the local PROFINET network to Proficloud over the Internet, thereby also enabling the use of cloud services in PROFINET. Furthermore, the cloud coupler protects the local PROFINET network against unauthorized access from the Internet by means of two independent network interfaces.

Features:

– Web-based management
– Emulates up to 15 Proficloud devices
– PROFINET network can be extended to include Cloud services, without requiring any further specialist knowledge
– Secure communication, thanks to TLS encryption

Cloud coupler

Technical data

Computer data		
Operating systems		Linux
Interfaces		1x USB 2.0
Network		2x Ethernet (10/100/1000 Mbps), RJ45
Power supply		24 V DC ±20 %
General data		
Dimensions	W / H / D	155 mm / 145 mm / 49 mm
Degree of protection		IP20
Ambient temperature (operation)		0 °C ... 50 °C
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Cloud coupler, for connecting the local PROFINET network to Proficloud	CLOUD COUPLER-PRO	2402990	1

Cloud software development kit

With Proficloud you can network your production systems across locations. The software development kit (SDK) allows you to freely program individual cloud services.

Your advantages:

– Extension of the PROFINET network to include individual cloud services
– Free programming possible with the SDK in Java

Software development kit

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Software development kit, for free programming of individual cloud services	CLOUD SDK4J	2404475	1

Cloud runtime

Various cloud runtimes are available for using devices in Proficloud. The credit is activated in the cloud application. Billing is in units. Runtimes of up to ten years are possible.

Credit for runtime in Proficloud

	Ordering data		
Description	Type	Order No.	Pcs./Pkt.
Credit, for using devices in Proficloud			
- Runtime 1 year; credit: 8760 units	CLOUD CREDIT-1	2402989	1
- Runtime 2 years; credit: 17,520 units	CLOUD CREDIT-2	2402988	1
- Runtime 5 years; credit: 43,800 units	CLOUD CREDIT-5	2402987	1
- Runtime 10 years; credit: 87,600 units	CLOUD CREDIT-10	2402986	1

Cloud services

With cloud services, practically all information provided by the cloud can be communicated directly to the field level. You can transmit, for example, ERP task data directly from Proficloud to your production system via the PROFINET protocol. Taking the indirect route, via other levels in the automation pyramid, is no longer required.

The cloud service system coupler connects two PROFINET networks via Proficloud.

Thanks to the cloud service calculations, you can move complex calculations to the cloud. This takes the load off local hardware and reduces costs.

The cloud weather service provides weather data from the cloud. This means that a physical weather station is no longer necessary.

Cloud services for communication

	Ordering data		
Description	Type	Order No.	Pcs./Pkt.
License, for performing calculations in Proficloud	CLOUD SERVICE/CALC	2403326	1
License, for using meteorological information in Proficloud	CLOUD SERVICE/WEATHER	2403325	1
License, for using a system coupler in Proficloud	CLOUD SERVICE/SYSTEMCOUPLER	2404449	1

Prozessgrafik
Spritzdruck
Innendruck
Nachdruck
Staudruck
Zoom 1:5
PV1
PV2
PV3
PHOENIX CONTACT

HMIs and industrial PCs

HMIs and industrial PCs are the key to the efficient operation and monitoring of your systems and machines. You can work with a fully enclosed IP65 panel PC directly on site – or design detailed user interfaces as the interface to your system using a powerful HMI device.

Industrial PCs and HMIs from Phoenix Contact are so versatile and flexible that they do not present any restrictions for your operation and monitoring concepts. Visu+ and WebVisit are the corresponding visualization software tools.

HMIs

Human-machine interfaces, or HMIs for short, represent cost-effective automation based on efficient input and monitoring. Depending on your requirements, you can select devices for WebVisit or Visu+ software, or for HTML5 applications. Whether directly on site, centrally in the control center, high performance or multifunctional: it is you who determines the features of the HMIs.

Industrial PCs

Industrial PCs, or IPCs for short, combine the computing capacity of modern processors with the robustness and reliability of industrial components. Together with the right software, IPCs are efficient and versatile solutions for controlling, operating, and monitoring systems and machines.

HMIs and industrial PCs for outdoor applications

Outdoor HMIs and industrial PCs are designed for permanent exposure to weather influences. Thanks to the IP67-protected front, a display that can be read under direct sunlight, and an extended temperature range, you can use these devices, for example, in charging stations and in other outdoor applications such as wastewater treatment plants.

HMIs and industrial PCs for maritime applications

For demanding use on ships, Phoenix Contact offers robust operator and display panels. HMIs and industrial PCs for maritime applications are specially tested and approved for shipbuilding.

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HMIs for HTML5 applications

Web panels with open browser

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HMIs for WebVisit software

Minitouch

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Box PCs

Box PCs

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Box PCs

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Box PCs

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Panel PCs

Embeddedline panel PCs

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Panel PCs with IP65

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Software

WebVisit – development software for web-based visualizations

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Visu+ – SCADA visualization, development and runtime licenses

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HMIs for Visu+ software

Touch panels

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Touch panels

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Rackmount PCs

Rackmount PC – 4U

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Rackmount PC – 2U

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Software PLC

PC WORX RT BASIC – software PLC with realtime extension

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PC WORX SRT – software PLC without realtime extension

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Tablet PCs

Tablet PCs

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Monitors with touch function

Monitors with touch function

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HMIs and IPCs for outdoor applications

Web panels and panel PCs

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HMIs and IPCs for maritime applications

Touch panels and panel PCs

Page 48

Web panels with open browser

These touch panels are operator panels with a WebKit-based browser as the user software. This means that all web-based visualizations that support the current HTML5 web standard can be displayed.

Your advantages:

– Used exclusively for operation, the browser is the only interactive interface
– Flexible, thanks to open web standard and free choice of web server and visualization software
– Independent visualization with self-programmed JavaScript applications
– Secure communication, thanks to SSL-encrypted data transmission
– No security updates for Java or Flash plug-ins, thanks to HTML5
– Display formats in 4:3 or 16:9

14.5 cm (5.7") TFT color display

Ex:

Technical data

Display data		
Display		14.5 cm/5.7" TFT active
Screen resolution		640 x 480 pixels (VGA)
Display lighting type		LED
Brightness		400 cd/m², typical (adjustable)
Display backlight MTBF		40000 h
Color spectrum		262144 colors
Touch technology		Analog resistive (polyester)
Computer data		
Operating systems		Debian GNU/Linux
Processor		ARM® Cortex®-A8, 800 MHz
RAM		512 MB RAM
Mass storage		1 GB NAND-Flash
Interfaces		2x USB Host 2.0
Network		1 x Ethernet (10/100 Mbps), RJ45
Power supply		24 V DC ±20 %
Dimensions		
External dimensions (front plate)	W / H / D	168 mm / 126 mm / 5 mm
Installation cutout	W / H / D	160 mm / 118 mm / 42 mm
General data		
Degree of protection		IP65 (front), IP20 (back)
Ambient temperature (operation)		0 °C ... 50 °C
Mounting type		Front installation
Vibration (operation)		DIN EN 60068-2-6
Shock		DIN EN 60068-2-27
EMC note		

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Touch panel with graphics-capable TFT display, 1 x Ethernet, 2 x USB, and integrated Midori browser	**WP 3057V**	2400251	1

Accessories

Mounting kit, including hardware for installation - panel installation	**HMI SCB MOUNTING KIT 6**	2701385	1

17.8 cm (7") TFT color display

26.4 cm (10.4") TFT color display

30.7 cm (12.1") TFT color display

Ex:

Ex:

Ex:

Technical data

Display	17.8 cm/7" TFT
	800 x 480 pixels (WVGA)
	LED
	350 cd/m², typical (adjustable)
	40000 h
	262144 colors
	Analog resistive (polyester)
System	Debian GNU/Linux
	ARM® Cortex®-A8, 800 MHz
	512 MB RAM
	1 GB NAND-Flash
	2x USB Host 2.0
	1 x Ethernet (10/100 Mbps), RJ45
	24 V DC ±20 %
Dimensions	203 mm / 147 mm / 5 mm
	195 mm / 139 mm / 42 mm
Ambient conditions	IP65 (front), IP20 (back)
	0 °C ... 50 °C
	Front installation
	DIN EN 60068-2-6
	DIN EN 60068-2-27

Ordering data

Type	Order No.	Pcs./Pkt.
WP 3070W	2400253	1

Accessories

HMI SCB MOUNTING KIT 6	2701385	1

Technical data

Display	26.4 cm/10.4" TFT
	800 x 600 pixels (SVGA)
	LED
	340 cd/m² typical (adjustable)
	50000 h
	262144 colors
	Analog resistive (polyester)
System	Debian GNU/Linux
	ARM® Cortex®-A8, 800 MHz
	512 MB RAM
	1 GB NAND-Flash
	2x USB Host 2.0
	1 x Ethernet (10/100 Mbps), RJ45
	24 V DC ±20 %
Dimensions	295 mm / 220 mm / 5 mm
	287 mm / 212 mm / 54 mm
Ambient conditions	IP65 (front), IP20 (back)
	0 °C ... 50 °C
	Front installation
	DIN EN 60068-2-6
	DIN EN 60068-2-27
	Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
WP 3105S	2400254	1

Accessories

HMI SCB MOUNTING KIT 6	2701385	1

Technical data

Display	30.7 cm / 12.1" TFT
	1280 x 800 pixels (WXGA)
	LED
	320 cd/m² typical (adjustable)
	50000 h
	16.7 million colors
	Analog resistive (polyester)
System	Debian GNU/Linux
	ARM® Cortex®-A8, 800 MHz
	512 MB RAM
	1 GB NAND-Flash
	2x USB Host 2.0
	1 x Ethernet (10/100 Mbps), RJ45
	24 V DC ±20 %
Dimensions	330 mm / 225 mm / 5 mm
	322 mm / 217 mm / 48 mm
Ambient conditions	IP65 (front), IP20 (back)
	0 °C ... 50 °C
	Front installation
	DIN EN 60068-2-6
	DIN EN 60068-2-27
	Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
WP 3120W	2400255	1

Accessories

HMI SCB MOUNTING KIT 8	2701387	1

Web panel and minitouch devices are inexpensive operator panels for basic operation and monitoring tasks.

Features:

– Tailor-made for class 100 modular small-scale controllers
– Fast startup, thanks to Plug and Play
– **Minitouch:** alphanumeric 4-color display
– **Web panel:** full graphic color display for clear representation
– Quick and user-friendly representation of your control variables using PC Worx Express and WebVisit software tools
– Multi-user operation thanks to server/client structure
– Easy device replacement, as the project is saved on the PLC
– Display formats in 4:3 or 16:9

Minitouch
7.1 cm (2.8") TFT color display

Technical data

Display data		
Display		7.1 cm/2.8" TFT
Screen resolution		320 x 240 pixels (QVGA)
Display lighting type		LED
Brightness		280 cd/m², typical (adjustable)
Display backlight MTBF		40000 h
Color spectrum		4 colors
Touch technology		Analog resistive (polyester)
Computer data		
Operating systems		Keil RTX (RTOS)
Processor		Cortex™-M3 120 MHz
RAM		96 kB SRAM
Mass storage		512 kB Flash
Interfaces		without
Network		1 x Ethernet (10/100 Mbps), RJ45
Power supply		24 V DC ±20 %
Dimensions		
External dimensions (front plate)	W / H / D	96 mm / 72 mm / 60 mm
Installation cutout	W / H / D	92.8 mm / 68.7 mm / 53.5 mm
General data		
Degree of protection		IP54 (front), IP20 (back)
Ambient temperature (operation)		0 °C ... 50 °C
Mounting type		Front installation
Vibration (operation)		DIN EN 60068-2-6
Shock		DIN EN 60068-2-27
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Minitouch			
- 7.1 cm (2.8") display	**TD 1030T**	2701257	1
Web panel			
- 8.9 cm (3.5") display			
- 14.5 cm (5.7") display			
- 26.4 cm (10.5") display			
- 38.1 cm (15") display			
Widescreen web panel			
- 17.8 cm (7") display			
- 22.9 cm (9") display			

Accessories

Mounting kit, including hardware for installation			
- panel installation			

Web panel
8.9 cm (3.5")/14.5 cm (5.7")
TFT color display

Web panel
26.4 cm (10.4")/38.1 cm (15")
TFT color display

Widescreen web panel
17.8 cm (7")/22.9 cm (9")
TFT color display

Technical data

WP 04T	WP 06T
8,9 cm / 3,5"-TFT	14.5 cm/5.7" TFT active
320 x 240 pixels (QVGA)	
LED	
350 cd/m², typical (adjustable)	400 cd/m², typical (adjustable)
40000 h	
65536 colors	
Analog resistive (polyester)	
Windows® CE 5.0	
ARM9™, 200 MHz	
64 MB SDRAM	
32 MByte flash memory	
2x USB Host 2.0	
1 x Ethernet (10/100 Mbps), RJ45	
24 V DC ±20 %	
120 mm / 90 mm / 5 mm	168 mm / 126 mm / 5 mm
112 mm / 82 mm / 35 mm	160 mm / 118 mm / 42 mm
IP65 (front), IP20 (back)	
0 °C ... 50 °C	
Front installation	
DIN EN 60068-2-6	
DIN EN 60068-2-27	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
WP 04T	2913632	1
WP 06T	2913645	1

Accessories

HMI SCB MOUNTING KIT 6	2701385	1

Technical data

WP 10T	WP 15T
26.4 cm/10.4" TFT	38.1 cm/15" TFT
800 x 600 pixels (SVGA)	1024 x 768 pixels (XGA)
LED	
340 cd/m² typical (adjustable)	480 cd/m² typical (adjustable)
50000 h	
65536 colors	
Analog resistive (polyester)	
Windows® CE 5.0	
ARM9™, 200 MHz	
64 MB SDRAM	
32 MByte flash memory	
2x USB Host 2.0	
1 x Ethernet (10/100 Mbps), RJ45	
24 V DC ±20 %	
295 mm / 220 mm / 5 mm	400 mm / 329 mm / 5 mm
287 mm / 212 mm / 55 mm	374 mm / 303 mm / 60 mm
IP65 (front), IP20 (back)	
0 °C ... 50 °C	
Front installation	
DIN EN 60068-2-6	
DIN EN 60068-2-27	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
WP 10T	2700934	1
WP 15T	2700935	1

Accessories

HMI SCB MOUNTING KIT 6	2701385	1

Technical data

WP 07T/WS	WP 09T/WS
17.8 cm/7" TFT	22.9 cm/9" TFT
800 x 480 pixels (WVGA)	
LED	
350 cd/m², typical (adjustable)	400 cd/m², typical (adjustable)
> 50000 h	
65536 colors	
Analog resistive (polyester)	
Windows® CE 5.0	
ARM9™, 200 MHz	
64 MB SDRAM	
32 MByte flash memory	
2x USB Host 2.0	
1 x Ethernet (10/100 Mbps), RJ45	
24 V DC ±20 %	
203 mm / 147 mm / 5 mm	260 mm / 172 mm / 5 mm
195 mm / 139 mm / 54 mm	252 mm / 164 mm / 54 mm
IP65 (front), IP20 (back)	
0 °C ... 50 °C	
Front installation	
DIN EN 60068-2-6	
DIN EN 60068-2-27	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
WP 07T/WS	2700307	1
WP 09T/WS	2700309	1

Accessories

HMI SCB MOUNTING KIT 8	2701387	1

Touch panels

new

Powerful touch panels for visualizing demanding applications. With the integrated Visu+ software, you can design complex operating and monitoring interfaces and benefit from flexible connection to a wide range of third-party systems.

Your advantages:

– Powerful and versatile, thanks to the new processor generation and integrated Visu+ visualization software
– Flexible connection, thanks to various drivers, even for third-party systems
– Optional mobile system access with the Visu+ mobile app
– Robust and durable, thanks to the aluminum front
– Various display sizes and image formats

10.92 cm (4.3") TFT color display

Ex:

14.5 cm (5.7") TFT color display

Ex:

		Technical data	Technical data
Display data			
Display		10,92 cm / 4,3"-TFT	14.5 cm/5.7" TFT active
Screen resolution		480 x 272 pixels (WQVGA)	320 x 240 pixels (QVGA)
Display lighting type		LED	LED
Brightness		385 cd/m² typical (adjustable)	400 cd/m², typical (adjustable)
Display backlight MTBF		40000 h	40000 h
Color spectrum		262144 colors	65536 colors
Touch technology		Analog resistive (polyester)	Analog resistive (polyester)
Computer data			
Operating systems		Windows® Embedded Compact 7	Windows® Embedded Compact 7
Processor		ARM® Cortex®-A8, 800 MHz	ARM® Cortex®-A8, 800 MHz
RAM		512 MB RAM	512 MB RAM
Mass storage		1 GB Flash	1 GB Flash
Interfaces		2x USB Host 2.0	2x USB host 2.0
Network		1 x Ethernet (10/100 Mbps), RJ45	1 x Ethernet (10/100 Mbps), RJ45
Power supply		24 V DC ±20 %	24 V DC ±20 %
Dimensions			
External dimensions (front plate)	W / H / D	140 mm / 100 mm / 5 mm	203 mm / 147 mm / 5 mm
Installation cutout	W / H / D	132 mm / 92 mm / 42 mm	195 mm / 139 mm / 42 mm
General data			
Degree of protection		IP65 (front), IP20 (back)	IP65 (front), IP20 (back)
Ambient temperature (operation)		0 °C ... 50 °C	0 °C ... 50 °C
Mounting type		Front installation	Front installation
Vibration (operation)		DIN EN 60068-2-6	DIN EN 60068-2-6
Shock		DIN EN 60068-2-27	DIN EN 60068-2-27

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Touch panel with graphics-capable TFT display, 1 x Ethernet, 2 x USB, integrated AX OPC server and integrated runtime of the Visu+ visualization software	**TP 3043W**	2402629	1	**TP 3057Q**	2400452	1
	Accessories			**Accessories**		
Mounting kit, including hardware for installation - panel installation	**HMI SCB MOUNTING KIT 6**	2701385	1	**HMI SCB MOUNTING KIT 6**	2701385	1

new

14.5 cm (5.7") TFT color display

Ex:

17.8 cm (7") TFT color display

Ex:

22.9 cm (9") TFT color display

Ex:

Technical data

14.5 cm/5.7" TFT active
640 x 480 pixels (VGA)
LED
400 cd/m², typical (adjustable)
40000 h
262144 colors
Analog resistive (polyester)
Windows® Embedded Compact 7
ARM® Cortex®-A8, 800 MHz
512 MB RAM
1 GB Flash
2x USB Host 2.0
1 x Ethernet (10/100 Mbps), RJ45
24 V DC ±20 %
168 mm / 126 mm / 5 mm
160 mm / 118 mm / 42 mm
IP65 (front), IP20 (back)
0 °C ... 50 °C
Front installation
DIN EN 60068-2-6
DIN EN 60068-2-27

Ordering data

Type	Order No.	Pcs./Pkt.
TP 3057V	2400453	1

Accessories

HMI SCB MOUNTING KIT 6	2701385	1

Technical data

17.8 cm/7" TFT
800 x 480 pixels (WVGA)
LED
350 cd/m², typical (adjustable)
40000 h
262144 colors
Analog resistive (polyester)
Windows® Embedded Compact 7
ARM® Cortex®-A8, 800 MHz
512 MB RAM
1 GB Flash
2x USB Host 2.0
1 x Ethernet (10/100 Mbps), RJ45
24 V DC ±20 %
203 mm / 147 mm / 5 mm
195 mm / 139 mm / 42 mm
IP65 (front), IP20 (back)
0 °C ... 50 °C
Front installation
DIN EN 60068-2-6
DIN EN 60068-2-27

Ordering data

Type	Order No.	Pcs./Pkt.
TP 3070W	2400454	1

Accessories

HMI SCB MOUNTING KIT 8	2701387	1

Technical data

22.9 cm/9" TFT
800 x 480 pixels (WVGA)
LED
800 cd/m², typical (adjustable)
40000 h
262144 colors
Analog resistive (polyester)
Windows® Embedded Compact 7
ARM® Cortex®-A8, 800 MHz
512 MB RAM
1 GB Flash
2x USB Host 2.0
1 x Ethernet (10/100 Mbps), RJ45
24 V DC ±20 %
260 mm / 172 mm / 5 mm
252 mm / 164 mm / 54 mm
IP65 (front), IP20 (back)
0 °C ... 50 °C
Front installation
DIN EN 60068-2-6
DIN EN 60068-2-27

Ordering data

Type	Order No.	Pcs./Pkt.
TP 3090W	2402630	1

Accessories

HMI SCB MOUNTING KIT 8	2701387	1

Touch panels

Powerful touch panels for visualizing demanding applications. With the integrated Visu+ software, you can design complex operating and monitoring interfaces and benefit from flexible connection to a wide range of third-party systems.

Your advantages:

– Powerful and versatile, thanks to the new processor generation and integrated Visu+ visualization software
– Flexible connection, thanks to various drivers, even for third-party systems
– Optional mobile system access with the Visu+ mobile app
– Robust and durable, thanks to the aluminum front
– Various display sizes and image formats

26.4 cm (10.4") TFT color display

Ex:

30.7 cm (12.1") TFT color display

Ex:

		Technical data	Technical data
Display data			
Display		26.4 cm/10.4" TFT	30.7 cm / 12.1" TFT
Screen resolution		800 x 600 pixels (SVGA)	1280 x 800 pixels (WXGA)
Display lighting type		LED	LED
Brightness		340 cd/m² typical (adjustable)	320 cd/m² typical (adjustable)
Display backlight MTBF		50000 h	50000 h
Color spectrum		262144 colors	65536 colors
Touch technology		Analog resistive (polyester)	Analog resistive (polyester)
Computer data			
Operating systems		Windows® Embedded Compact 7	Windows® Embedded Compact 7
Processor		ARM® Cortex®-A8, 800 MHz	ARM® Cortex®-A8, 800 MHz
RAM		512 MB RAM	512 MB RAM
Mass storage		1 GB Flash	1 GB Flash
Interfaces		2x USB Host 2.0	2x USB Host 2.0
Network		1 x Ethernet (10/100 Mbps), RJ45	1 x Ethernet (10/100 Mbps), RJ45
Power supply		24 V DC ±20 %	24 V DC ±20 %
Dimensions			
External dimensions (front plate)	W / H / D	295 mm / 220 mm / 5 mm	330 mm / 225 mm / 5 mm
Installation cutout	W / H / D	287 mm / 212 mm / 54 mm	322 mm / 217 mm / 48 mm
General data			
Degree of protection		IP65 (front), IP20 (back)	IP65 (front), IP20 (back)
Ambient temperature (operation)		0 °C ... 50 °C	0 °C ... 50 °C
Mounting type		Front installation	Front installation
Vibration (operation)		DIN EN 60068-2-6	DIN EN 60068-2-6
Shock		DIN EN 60068-2-27	DIN EN 60068-2-27
EMC note		Class A product, see page 525	Class A product, see page 525

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Touch panel with graphics-capable TFT display, 1 x Ethernet, 2 x USB, integrated AX OPC server and integrated runtime of the Visu+ visualization software	**TP 3105S**	2400455	1	**TP 3120W**	2400457	1
	Accessories			**Accessories**		
Mounting kit, including hardware for installation - panel installation	**HMI SCB MOUNTING KIT 6**	2701385	1	**HMI SCB MOUNTING KIT 6**	2701385	1

new

30.7 cm (12.1") TFT color display

Ex:

38.1 cm (15") color TFT display

Ex:

39.12 cm (15.4") TFT color display

Ex:

Technical data

30.7 cm / 12.1" TFT	
800 x 600 pixels (SVGA)	
LED	
360 cd/m² typical (adjustable)	
50000 h	
262144 colors	
Analog resistive (polyester)	
Windows® Embedded Compact 7	
ARM® Cortex®-A8, 800 MHz	
512 MB RAM	
1 GB Flash	
2x USB Host 2.0	
1 x Ethernet (10/100 Mbps), RJ45	
24 V DC ±20 %	
340 mm / 270 mm / 5 mm	
313 mm / 243 mm / 55 mm	
IP65 (front), IP20 (back)	
0 °C ... 50 °C	
Front installation	
DIN EN 60068-2-6	
DIN EN 60068-2-27	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
TP 3121S	2400456	1

Accessories

HMI SCB MOUNTING KIT 6	2701385	1

Technical data

38.1 cm/15" TFT	
1024 x 768 pixels (XGA)	
LED	
480 cd/m² typical (adjustable)	
50000 h	
65536 colors	
Analog resistive (polyester)	
Windows® Embedded Compact 7	
ARM® Cortex®-A8, 800 MHz	
512 MB RAM	
1 GB Flash	
2x USB Host 2.0	
1 x Ethernet (10/100 Mbps), RJ45	
24 V DC ±20 %	
400 mm / 329 mm / 5 mm	
372 mm / 301 mm / 55 mm	
IP65 (front), IP20 (back)	
0 °C ... 50 °C	
Front installation	
DIN EN 60068-2-6	
DIN EN 60068-2-27	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
TP 3150S	2400458	1

Accessories

HMI SCB MOUNTING KIT 8	2701387	1

Technical data

39.12 cm / 15.4"-TFT	
1280 x 800 pixels (WXGA)	
LED	
360 cd/m² typical (adjustable)	
50000 h	
16.7 million colors	
Analog resistive (polyester)	
Windows® Embedded Compact 7	
ARM® Cortex®-A8, 800 MHz	
512 MB RAM	
1 GB Flash	
2x USB Host 2.0	
1 x Ethernet (10/100 Mbps), RJ45	
24 V DC ±20 %	
420 mm / 297 mm / 5 mm	
396 mm / 273 mm / 64 mm	
IP65 (front), IP20 (back)	
0 °C ... 50 °C	
Front installation	
1g, according to EN 60068-2-6	
15g, according to IEC 60068-2-27	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
TP 3154W	2402631	1

Accessories

HMI SCB MOUNTING KIT 8	2701387	1

Touch panels

new

new

Using the HMIs for the Visu+ visualization software, you can optimally reproduce your systems and processes. The devices have a new design and projected-capacitive (PCAP) touch displays with multi-touch function. The robust interface and various display sizes give you even more flexibility when it comes to system planning.

Your advantages:

– Robust and sturdy, thanks to glass front suitable for industrial use
– Integrated Visu+ visualization software
– Flexible connection, thanks to various drivers, even for third-party systems
– Fast response and display refresh, thanks to powerful processor
– Optional mobile system access with the Visu+ mobile app

17.8 cm (7") TFT color display

Ex:

22.9 cm (9") TFT color display

Ex:

		Technical data	Technical data
Display data			
Display		17.8 cm/7" TFT	22.9 cm/9" TFT
Screen resolution		800 x 480 pixels (WVGA)	800 x 480 pixels (WVGA)
Display lighting type		LED	LED
Brightness		400 cd/m², typical (adjustable)	800 cd/m², typical (adjustable)
Display backlight MTBF		50000 h	70000 h
Color spectrum		16.7 million colors	16.7 million colors
Touch technology		Projective-capacitive (PCAP)	Projective-capacitive (PCAP)
Computer data			
Operating systems		Windows® Embedded Compact 7	Windows® Embedded Compact 7
Processor		ARM® Cortex®-A8, 1000 MHz	ARM® Cortex®-A8, 1000 MHz
RAM		512 MB LPDDR RAM	512 MB LPDDR RAM
Mass storage		1 GB NAND-Flash	1 GB NAND-Flash
Interfaces		2x USB Host 2.0	2x USB Host 2.0
Network		1 x Ethernet (10/100 Mbps), RJ45	1 x Ethernet (10/100 Mbps), RJ45
Power supply		24 V DC ±20 %	24 V DC ±20 %
Dimensions			
External dimensions (front plate)	W / H / D	208 mm / 148.5 mm / 6 mm	271 mm / 179 mm / 6 mm
Installation cutout	W / H / D	198 mm / 138 mm / 53 mm	261 mm / 169 mm / 53 mm
General data			
Degree of protection		IP65 (front), IP20 (back)	IP65 (front), IP20 (back)
Ambient temperature (operation)		0 °C ... 50 °C	0 °C ... 50 °C
Mounting type		Front installation	Front installation
Vibration (operation)		DIN EN 60068-2-6	DIN EN 60068-2-6
Shock		DIN EN 60068-2-27	DIN EN 60068-2-27
EMC note		Class A product, see page 525	Class A product, see page 525

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Touch panel with graphics-capable TFT display, 1 x Ethernet, 2 x USB, and integrated runtime of the Visu+ visualization software	TP 3070W/P	2403459	1	TP 3090W/P	2403460	1
	Accessories			**Accessories**		
Mounting kit, including hardware for installation - panel installation	HMI SCB MOUNTING KIT 6	2701385	1	HMI SCB MOUNTING KIT 6	2701385	1

new

30.7 cm (12.1") TFT color display

Ex:

Technical data	
30.7 cm / 12.1" TFT	
1280 x 800 pixels (WXGA)	
LED	
320 cd/m² typical (adjustable)	
50000 h	
65536 colors	
Projective-capacitive (PCAP)	
Windows® Embedded Compact 7	
ARM® Cortex®-A8, 1000 MHz	
512 MB LPDDR RAM	
1 GB NAND-Flash	
2x USB Host 2.0	
1 x Ethernet (10/100 Mbps), RJ45	
24 V DC ±20 %	
336 mm / 234 mm / 3 mm	
326 mm / 224 mm / 53 mm	
IP65 (front), IP20 (back)	
0 °C ... 50 °C	
Front installation	
DIN EN 60068-2-6	
DIN EN 60068-2-27	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
TP 3120W/P	2403461	1

Accessories

HMI SCB MOUNTING KIT 6	2701385	1

new

39.6 cm (15.6") TFT color display

Ex:

Technical data	
39.6 cm/15.6" TFT	
1366 x 768 pixels (WXGA)	
LED	
320 cd/m² typical (adjustable)	
70000 h	
65536 colors	
Projective-capacitive (PCAP)	
Windows® Embedded Compact 7	
ARM® Cortex®-A8, 1000 MHz	
512 MB LPDDR RAM	
1 GB NAND-Flash	
2x USB Host 2.0	
1 x Ethernet (10/100 Mbps), RJ45	
24 V DC ±20 %	
436 mm / 278 mm / 6 mm	
425 mm / 260 mm / 53 mm	
IP65 (front), IP20 (back)	
0 °C ... 50 °C	
Front installation	
DIN EN 60068-2-6	
DIN EN 60068-2-27	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
TP 3156W/P	2403462	1

Accessories

HMI SCB MOUNTING KIT 8	2701387	1

new

47 cm (18.5") TFT color display

Technical data	
47.0 cm / 18.5" TFT	
1366 x 768 pixels (WXGA)	
LED	
240 cd/m², typical (adjustable)	
50000 h	
65536 colors	
Projective-capacitive (PCAP)	
Windows® Embedded Compact 7	
ARM® Cortex®-A8, 1000 MHz	
512 MB LPDDR RAM	
1 GB NAND-Flash	
2x USB Host 2.0	
1 x Ethernet (10/100 Mbps), RJ45	
24 V DC ±20 %	
485 mm / 329 mm / 6 mm	
475 mm / 311 mm / 53 mm	
IP65 (front), IP20 (back)	
0 °C ... 50 °C	
Front installation	
DIN EN 60068-2-6	
DIN EN 60068-2-27	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
TP 3185W/P	2403862	1

Accessories

HMI SCB MOUNTING KIT 8	2701387	1

Box PCs

new

Box PCs are compact, easy to maintain, and powerful. They are particularly impressive when it comes to demanding applications. These include measuring, controlling, and testing process and machine data or distributed visualizations in conjunction with remote monitors. Various mounting options and scalable performance make box PCs the ideal platform for machine building and systems manufacturing.

Your advantages:

– High system availability, thanks to a fanless design which is suitable for industrial applications and the absence of moving parts
– Versatile use, thanks to various mounting options, e.g., on the DIN rail
– Energy-efficient Intel® Atom™ and Celeron® processors
– Large-scale compatibility, thanks to open IT standards, numerous interfaces and operating systems
– Particularly easy to maintain, thanks to easily accessible components in the IPC housing

Additional features:

– Configurable based upon customer requirements
– System protection through the use of embedded operating systems

Notes:

You can find additional information about industrial PCs and the corresponding accessories in the product area of our website at phoenixcontact.net/products.

Box PC with Intel® Atom™ E3845 technology

Technical data

Computer data		
Operating system (configuration option)		without operating system Windows® 7 Professional SP1 (64-bit), German Windows® 7 Professional SP1 (64-bit), English Windows® 7 Ultimate SP1 (64 bit), Multi-language Windows® 7 Ultimate SP1 (32-bit), Multi-language Windows® 7 Professional SP1 (32-bit), English Windows® 7 Professional SP1 (32-bit), German Windows® Embedded Standard 7 SP1 (32-bit), Multi-language Windows® Embedded Standard 7 SP1 (64-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language
Processor (configuration option)		Intel® Atom™ E3845 1.91 GHz
RAM (configuration option)		4 GB DDR3
Mass storage (configuration option)		without mass storage 4 GB SSD (SLC) 8 GB SSD (SLC) 16 GB SSD (SLC) 32 GB SSD (SLC) 2.5" SSD (MLC), 80 GB 2.5" SSD (MLC),160 GB 2.5" SSD (MLC), 240 Gbyte 2.5" SSD (MLC), 480 Gbyte 320 GB HDD 2.5" SATA
Interfaces		1x COM (RS-232/422/485) 2x USB 2.0 1x USB 3.0
Optional interfaces (configuration option)		Without optional interface 1x COM (RS-232), 1x COM (RS-485), 2x CAN 1x COM (RS-232), 1x COM (RS-485)
Slots		SD card
Monitor output		1x DisplayPort
Network		2x Ethernet (10/100/1000 Mbps), RJ45
Power supply		24 V DC ±20 %
General data		
Dimensions	W / H / D	271 mm / 211 mm / 65 mm
Degree of protection		IP30
Ambient temperature (operation)		0 °C ... 45 °C (with HDD) 0 °C ... 50 °C (with SSD)
Permissible humidity (operation)		20 % ... 85 % (non-condensing)
Mounting type (configuration option)		Bookshelf mounting Wall mounting
Vibration (operation)		1g with SSD, 0.5g with HDD, according to EN 60068-2-6
Shock		DIN EN 60068-2-27
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Industrial PC - Configurable	**VL2 BPC 1000**	2403046	1

Box PC with Intel® Celeron® N2930 technology

Box PC with Intel® Celeron® N2930 technology and PCI/e slot

Ex:

Box PC with Intel® Celeron® N2930 technology and PCI slots

Ex:

Technical data

without operating system
Windows® 7 Professional SP1 (64-bit), English
Windows® 7 Professional SP1 (64-bit), German
Windows® 7 Ultimate SP1 (32-bit), Multi-language
Windows® 7 Ultimate SP1 (64 bit), Multi-language
Windows® 7 Professional SP1 (32-bit), English
Windows® 7 Professional SP1 (32-bit), German
Windows® Embedded Standard 7 SP1 (32-bit), Multi-language
Windows® 8.1 Professional (64-bit), German
Windows® 8.1 Professional (64 bit), English

Intel® Celeron® N2930 1.83 GHz/2.16 GHz
2 GB DDR3 SODIMM
4 GB DDR3 SODIMM
8 GB DDR3 SODIMM
without mass storage
4 GB CFast® card
8 GB CFast® card
16 GB CFast® card
32 GB CFast® card
16 GB SSD (SLC)
32 GB SSD (SLC)
2.5" SSD (MLC), 80 GB
2.5" SSD (MLC),160 GB
320 GB HDD 2.5" SATA
1x COM (RS-232/422/485)
2x COM (RS-232)
3x USB 2.0
1x USB 3.0
-

without slots

2x DisplayPort

2x Ethernet (10/100/1000 Mbps), RJ45
24 V DC ±20 %

162 mm / 146.2 mm / 49 mm
IP20
0 °C ... 50 °C

5 % ... 95 % (non-condensing)
Wall mounting
DIN rail mounting
DIN EN 60068-2-6
15g, 11 ms in accordance with IEC 60068-2-27
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
BL BPC 2000	2701712	1

Technical data

without operating system
Windows® 7 Professional SP1 (64-bit), German
Windows® 7 Professional SP1 (64-bit), English
Windows® 7 Ultimate SP1 (64 bit), Multi-language
Windows® 7 Ultimate SP1 (32-bit), Multi-language
Windows® 7 Professional SP1 (32-bit), English
Windows® 7 Professional SP1 (32-bit), German
Windows® Embedded Standard 7 SP1 (32-bit), Multi-language
Windows® Embedded Standard 7 SP1 (64-bit), Multi-language
Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language
Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language
Intel® Celeron® N2930 1.83 GHz/2.16 GHz
4 GB DDR3 SODIMM
8 GB DDR3 SODIMM

without mass storage
4 GB SSD (SLC)
8 GB SSD (SLC)
16 GB SSD (SLC)
32 GB SSD (SLC)
2.5" SSD (MLC), 80 GB
2.5" SSD (MLC),160 GB
320 GB HDD 2.5" SATA

1x COM (RS-232/422/485)
4x USB 2.0

Without optional interface
2x COM (RS-232), 1x COM (RS-232/422/485)

PCI/PCIe optional

2x DisplayPort

2x Ethernet (10/100/1000 Mbps), RJ45
24 V DC ±20 %

264 mm / 215 mm / 95 mm
IP30
0 °C ... 45 °C (with HDD)
-20 °C ... 50 °C (with SSD)

5 % ... 95 % (non-condensing)
Bookshelf mounting
Wall mounting
DIN EN 60068-2-6
15g, 11 ms in accordance with IEC 60068-2-27
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
VL2 BPC 2000	2400332	1

Technical data

without operating system
Windows® 7 Professional, German
Windows® 7 Professional SP1 (32-bit), English
Windows® 7 Professional SP1 (32-bit), German
Windows® 7 Professional SP1 (64-bit), English
Windows® 7 Professional SP1 (64-bit), German
Windows® 7 Ultimate SP1 (64 bit), Multi-language
Windows® 7 Ultimate SP1 (32-bit), Multi-language
Windows® Embedded Standard 7 SP1 (32-bit), Multi-language
Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language
Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language
Intel® Celeron® N2930 1.83 GHz/2.16 GHz
4 GB DDR3 SODIMM
8 GB DDR3 SODIMM

without mass storage
16 GB SSD (SLC)
32 GB SSD (SLC)
2.5" SSD (MLC), 80 GB
2.5" SSD (MLC),160 GB
4 GB CFast® card
8 GB CFast® card
16 GB CFast® card
32 GB CFast® card
320 GB HDD 2.5" SATA
1x COM (RS-232/422/485)
3x USB 2.0
1x USB 3.0

-

without slots
2x PCI
1x DisplayPort
1x VGA
2x Ethernet (10/100/1000 Mbps), RJ45
24 V DC ±20 %

265 mm / 207 mm / 87 mm
IP20
-20 °C ... 55 °C (Configuration options can affect the operating temperature. See user manual for details)

5 % ... 95 % (non-condensing)
Bookshelf mounting
Wall mounting
IEC 60068-2-27
15g, 11 ms impulse in accordance with IEC 60068-2-27
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
VL BPC 2000	2402759	1

Box PCs

Box PCs are compact, easy to maintain, and powerful. They are particularly impressive when it comes to demanding applications. These include measuring, controlling, and testing process and machine data or distributed visualizations in conjunction with remote monitors. Various mounting options and scalable performance make box PCs the ideal platform for machine building and systems manufacturing.

Your advantages:

- High system availability, thanks to a fanless design which is suitable for industrial applications and the absence of moving parts
- Powerful Intel® Core™ i processors for the most stringent requirements
- Large-scale compatibility, thanks to open IT standards, numerous interfaces and operating systems
- High system availability and data security, thanks to RAID support (0/1)
- Can be extended via PCI/PCIe slot
- Particularly easy to maintain, thanks to easily accessible components in the IPC housing
- Configurable based upon customer requirements

Notes:

You can find additional information about industrial PCs and the corresponding accessories in the product area of our website at phoenixcontact.net/products.

Box PC with Intel® Core™ i3-4010U technology and PCI/e slot

Ex:

Technical data

Computer data		
Operating system (configuration option)		without operating system Windows® 7 Professional SP1 (64-bit), German Windows® 7 Professional SP1 (64-bit), English Windows® 7 Ultimate SP1 (64 bit), Multi-language Windows® 7 Ultimate SP1 (32-bit), Multi-language Windows® 7 Professional SP1 (32-bit), English Windows® 7 Professional SP1 (32-bit), German Windows® Embedded Standard 7 SP1 (32-bit), Multi-language Windows® Embedded Standard 7 SP1 (64-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language
Processor		Intel® Core™ i3-4010U 1.70 GHz
RAM (configuration option)		4 GB DDR3 SODIMM 8 GB DDR3 SODIMM 16 GB DDR3 SODIMM
Mass storage (configuration option)		without mass storage 4 GB SSD (SLC) 8 GB SSD (SLC) 16 GB SSD (SLC) 32 GB SSD (SLC) 2.5" SSD (MLC), 80 GB 2.5" SSD (MLC),160 GB 320 GB HDD 2.5" SATA
Raid system		without Raid system
Interfaces		1x COM (RS-232/422/485) 2x USB 2.0 2x USB 3.0
Slots		PCI/PCIe optional
Monitor output		2x DisplayPort
Network		2x Ethernet (10/100/1000 Mbps), RJ45
Power supply		24 V DC ±20 %
General data		
Dimensions	W / H / D	264 mm / 215 mm / 95 mm
Degree of protection		IP30
Ambient temperature (operation)		0 °C ... 45 °C (with HDD)
Permissible humidity (operation)		5 % ... 95 % (non-condensing)
Mounting type (configuration option)		Bookshelf mounting Wall mounting
Vibration (operation)		DIN EN 60068-2-6
Shock		15g, 11 ms in accordance with IEC 60068-2-27
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Industrial PC			
	VL2 BPC 3000	2400492	1

new

Box PC with Intel® Core™ i3-4010U technology and PCI slots

Ex:

Technical data
without operating system Windows® 7 Professional SP1 (32-bit), German Windows® 7 Professional SP1 (32-bit), English Windows® 7 Professional SP1 (64-bit), English Windows® 7 Professional SP1 (64-bit), German Windows® Embedded Standard 7 SP1 (32-bit), Multi-language Windows® 7 Ultimate SP1 (64 bit), Multi-language Windows® 7 Ultimate SP1 (32-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language
Intel® Core™ i3-4010U 1.70 GHz
4 GB DDR3 SODIMM 8 GB DDR3 SODIMM 16 GB DDR3 SODIMM
without mass storage 16 GB SSD (SLC) 32 GB SSD (SLC) 2.5" SSD (MLC), 80 GB 2.5" SSD (MLC),160 GB 4 GB CFast® card 8 GB CFast® card 16 GB CFast® card 32 GB CFast® card 320 GB HDD 2.5" SATA
-
1x COM (RS-232/422/485) 3x USB 2.0 1x USB 3.0
without slots 2x PCI
1x DisplayPort 1x DVI-D
2x Ethernet (10/100/1000 Mbps), RJ45
24 V DC ±20 %
265 mm / 207 mm / 87 mm
IP20
-20 °C ... 50 °C (Configuration options can affect the operating temperature. See user manual for details)
5 % ... 95 % (non-condensing)
Bookshelf mounting Wall mounting
IEC 60068-2-27
15g, 11 ms impulse in accordance with IEC 60068-2-27
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
VL BPC 3000	2400183	1

Box PC with Intel® Core™ i5-4300U technology and PCI/e slot

Ex:

Technical data
without operating system Windows® 7 Professional SP1 (64-bit), German Windows® 7 Professional SP1 (64-bit), English Windows® 7 Ultimate SP1 (64 bit), Multi-language Windows® 7 Ultimate SP1 (32-bit), Multi-language Windows® 7 Professional SP1 (32-bit), English Windows® 7 Professional SP1 (32-bit), German Windows® Embedded Standard 7 SP1 (32-bit), Multi-language Windows® Embedded Standard 7 SP1 (64-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language
Intel® Core™ i5-4300U 1.9 GHz/2.9 GHz
4 GB DDR3 SODIMM 8 GB DDR3 SODIMM 16 GB DDR3 SODIMM
without mass storage 4 GB SSD (SLC) 8 GB SSD (SLC) 16 GB SSD (SLC) 32 GB SSD (SLC) 2.5" SSD (MLC), 80 GB 2.5" SSD (MLC),160 GB 320 GB HDD 2.5" SATA
0, 1
1x COM (RS-232/422/485) 2x USB 2.0 2x USB 3.0
PCI/PCIe optional
2x DisplayPort
2x Ethernet (10/100/1000 Mbps), RJ45
24 V DC ±20 %
264 mm / 215 mm / 95 mm
IP30
0 °C ... 45 °C (with HDD)
5 % ... 95 % (non-condensing)
Bookshelf mounting Wall mounting
DIN EN 60068-2-6
15g, 11 ms in accordance with IEC 60068-2-27
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
VL2 BPC 7000	2400333	1

Box PC with Intel® Core™ i7-6822EQ technology and PCI/e slot

Technical data
without operating system Windows® 7 Professional SP1 (64-bit), German Windows® 7 Professional SP1 (64-bit), English Windows® 7 Ultimate SP1 (64 bit), Multi-language Windows® 7 Ultimate SP1 (32-bit), Multi-language Windows® 7 Professional SP1 (32-bit), English Windows® 7 Professional SP1 (32-bit), German Windows® Embedded Standard 7 SP1 (32-bit), Multi-language Windows® Embedded Standard 7 SP1 (64-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language
Intel® Core™ i7-6822EQ 2 GHz/2.8 GHz
4 GB DDR4 SODIMM 8 GB DDR4 SODIMM 16 GB DDR4 SODIMM
without mass storage 4 GB SSD (SLC) 8 GB SSD (SLC) 16 GB SSD (SLC) 32 GB SSD (SLC) 2.5" SSD (MLC), 80 GB 2.5" SSD (MLC),160 GB 320 GB HDD 2.5" SATA
0, 1
1x COM (RS-232/422/485) 2x USB 2.0 2x USB 3.0
PCI/PCIe optional
2x DisplayPort
2x Ethernet (10/100/1000 Mbps), RJ45
24 V DC ±20 %
264 mm / 215 mm / 95 mm
IP30
0 °C ... 45 °C (with HDD)
5 % ... 95 % (non-condensing)
Bookshelf mounting Wall mounting
DIN EN 60068-2-6
15g, 11 ms in accordance with IEC 60068-2-27
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
VL2 BPC 9000	2400499	1

Rackmount PCs

Data acquisition and management, measurement, visualization or processing of large volumes of data in industrial image processing: the new powerful Rackmount PCs in standardized 19" format provide the right solution for sophisticated applications in your industry.

Your advantages:

– Tailored to the 19" rack format with 2 RU or 4 RU (Rack Units)
– Suitable for every application, thanks to scalable, powerful, and energy-efficient 4th Generation Intel® processors
– Can be extended via PCI/PCIe slots
– High system availability and data security, thanks to RAID support (0/1/5)
– Easy maintenance, thanks to 2 or 3 hot swappable drives
– Increased security, thanks to lockable front flap
– Easy access to air filters

Rackmount PC with 2 RU

Rackmount PC with 4 RU

Technical data

Computer data	
Processor (configuration option)	Intel® Core™ i7-4770S 3.90 GHz Intel® Core™ i3-4330TE 2.40 GHz
RAM (configuration option)	16 GB DDR3 SODIMM 8 GB DDR3-1066 SODIMM
Mass storage (configuration option)	without mass storage 1 TB HDD 3.5" SATA 2 TB HDD 3.5" SATA 4 TB HDD 3.5" SATA
Raid system	0, 1
Interfaces	1x COM (RS-232/422/485) 1x RS-232 4x USB 2.0 2x USB 3.0
Slots	optional
Extended functions	3x PCI 1x PCIe x8 1x PCIe x16
Monitor output	1x DVI-D
Network	2x Ethernet (10/100/1000 Mbps), RJ45
Power supply	110/220 V AC
General data	
Degree of protection	IP20
Ambient temperature (operation)	0 °C ... 55 °C (Configuration options can affect the operating temperature. See user manual for details)
Permissible humidity (operation)	5 % ... 95 % (non-condensing)
Mounting type	Installation in the control cabinet (19")
Vibration (operation)	DIN EN 60068-2-6
Shock	15g in all directions in acc. with IEC 60068-2-27

Technical data

Computer data	
Processor (configuration option)	Intel® Core™ i7-4770S 3.90 GHz Intel® Core™ i3-4330TE 2.40 GHz
RAM (configuration option)	16 GB DDR3 SODIMM 8 GB DDR3-1066 SODIMM
Mass storage (configuration option)	without mass storage 1 TB HDD 3.5" SATA 2 TB HDD 3.5" SATA 4 TB HDD 3.5" SATA
Raid system	0, 1, 5
Interfaces	1x COM (RS-232/422/485) 1x RS-232 6x USB 2.0 2x USB 3.0
Slots	optional
Extended functions	8x PCI 1x PCIe x8 1x PCIe x16
Monitor output	1x DVI-D
Network	2x Ethernet (10/100/1000 Mbps), RJ45
Power supply	110/220 V AC
General data	
Degree of protection	IP20
Ambient temperature (operation)	0 °C ... 55 °C (Configuration options can affect the operating temperature. See user manual for details)
Permissible humidity (operation)	5 % ... 95 % (non-condensing)
Mounting type	Installation in the control cabinet (19")
Vibration (operation)	DIN EN 60068-2-6
Shock	15g in all directions in acc. with IEC 60068-2-27

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Rackmount PC			
- 19-inch, 2U	**BL RACKMOUNT 2U**	2400063	1
- 19-inch, 4U	**BL RACKMOUNT 4U**	2400064	1

Accessories

Mass storage			
- 1 TB HDD 3.5"	**IPC 3.5 1TB HDD**	2403835	1
- 2 TB HDD 3.5"	**IPC 3.5 2TB HDD**	2403836	1
- 4 TB HDD 3.5"	**IPC 3.5 4TB HDD**	2403837	1
Redundant power supply for the BL RACKMOUNT 2U			
	BL RM 2U REDUNDANT 350W PS	2404379	4

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Rackmount PC			
- 19-inch, 2U	**BL RACKMOUNT 2U**	2400063	1
- 19-inch, 4U	**BL RACKMOUNT 4U**	2400064	1

Accessories

Mass storage			
- 1 TB HDD 3.5"	**IPC 3.5 1TB HDD**	2403835	1
- 2 TB HDD 3.5"	**IPC 3.5 2TB HDD**	2403836	1
- 4 TB HDD 3.5"	**IPC 3.5 4TB HDD**	2403837	1
Redundant power supply for the BL RACKMOUNT 2U			
	BL RM 2U REDUNDANT 350W PS	2404379	4

Software PLC for installation on IPCs

Industrial PCs for visualizing and operating processes are often only utilized to a limited extent. Make use of these available resources and also transform your industrial PC into a full-fledged PLC.

Depending on the performance requirements, choose between **PC WORX SRT** with statistically guaranteed response times for small to medium tasks and **PC WORX RT BASIC** for complex automation with realtime requirements.

Your advantages:

– Stable and reliable, thanks to operating system expansion with PC WORX RT BASIC
– Easy and inexpensive visualization, thanks to integrated web server
– Maximum Ethernet openness, as all common protocols are supported

Software PLC
With realtime extension

Software PLC
Without realtime extension

	Technical data	Technical data
Hardware requirements		
Processor	min. Intel® Core™2 Duo	min. Intel® Atom™
Main memory (RAM)	min. 2 Gbyte	min. 512 Mbyte
Hard disk memory	min. 1 Gbyte	min. 1 Gbyte
Interfaces	Ethernet port, USB port	Ethernet Port
Operating equipment	Keyboard, mouse recommended	Keyboard, mouse recommended
Monitor resolution	XGA (1024 x 768)	XGA (1024 x 768)
Software requirements		
Operating systems	Windows® 7 (32-bit/64-bit) Windows® Embedded Standard 7 Windows® Embedded 2009 Windows® 10 (32-bit/64-bit) Windows® 8.1 (32-bit/64-bit)	Windows® 7 (32-bit/64-bit) Windows® Embedded Standard 7 Windows® Embedded 2009 Windows® 10 (32-bit/64-bit) Windows® 8.1 (32-bit/64-bit)
Supported browsers	Internet Explorer Version 8 or later	Internet Explorer Version 8 or later
Basic functions		
	Complete PLC PROFINET controller and device functionality only in conjunction with a Valueline PC INTERBUS functionality only in conjunction with an INTERBUS master controller board Integration of Modbus/TCP in the firmware	Complete PLC Non-realtime-capable software PLC for installation on a standard PC with integrated Modbus TCP, plus PROFINET controller and device functionality
IEC-61131 runtime system		
Programmable under	PC Worx in IEC 61131	PC Worx in IEC 61131
Processing speed	0.001 ms (1 K mixed instructions, Intel® Core™2 Duo 1.5 GHz) 0.7 µs (1 K bit instructions, Intel® Core™2 Duo 1.5 GHz)	5.5 µs (1 K mixed instructions, Intel® Atom™ Z510PT) 4 µs (1 K bit instructions, Intel® Atom™ Z510PT)
Program memory	8 Mbyte	1 Mbyte
Mass storage	16 Mbyte	1 Mbyte
Retentive mass storage	240 kbyte	48 kbyte
Number of data blocks	depends on mass storage	depends on mass storage
Number of timers, counters	Depends on mass storage	Depends on mass storage
Number of control tasks	16	8

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Software PLC	**PC WORX RT BASIC**	2700291	1	**PC WORX SRT**	2701680	1
	Accessories			**Accessories**		
PC controller board	**IBS PCI SC/I-T**	2725260	1			
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers	**AX OPC SERVER**	2985945	1	**AX OPC SERVER**	2985945	1
Industrial PC	**See page 24 onwards**			**See page 24 onwards**		

Embeddedline panel PCs

new

Notes:

You can find additional information about industrial PCs and the corresponding accessories in the product area of our website at phoenixcontact.net/products.

The Embeddedline range consists of configurable embedded panel PCs with analog-resistive touch technology and appealing designs.

When it comes to automating simple applications in restricted spaces, the devices are the ideal solution: narrow, fanless, and with comprehensive functions.

Depending on your requirements, you can use AMD®-G or Intel® Atom™-E3845 series processors.

Additional features:

– Front plate made from anodized aluminum
– Can be configured according to customer requirements
– Widescreen displays from 7" to 15.4"
– Standard displays from 5.7" to 15"

14.5 cm (5.7") / 17.8 cm (7") display

Technical data

	EL PPC5.7 1000	EL PPC7 1000
Display data		
Display	14.5 cm/5.7" TFT active	17.8 cm/7" TFT
Screen resolution	640 x 480 pixels (VGA)	800 x 480 pixels (WVGA)
Display lighting type	LED	
Brightness	350 cd/m², typical (adjustable)	
Display backlight MTBF	> 40000 h	
Touch technology	Analog resistive (polyester)	
Computer data		
Operating system (configuration option)	without operating system Windows® Embedded Standard 7 Windows® Embedded Standard 7 SP1 (64-bit), Multi-language Windows® 7 Professional SP1 (32-bit), English Windows® 7 Professional SP1 (64-bit), English Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language	
Processor (configuration option)	AMD Embedded G-Series (T40R), 1.0 GHz AMD Embedded G-Series (T40E), 2x 1.0 GHz Intel® Atom™ E3845 1.91 GHz	
RAM (configuration option)	2 GB DDR3 4 GB DDR3	
Mass storage (configuration option)	SATA DOM SSD (SLC), 8 GB SATA DOM SSD (SLC),16 GB SATA DOM SSD (SLC), 32 GB SATA DOM SSD (MLC), 64 GB	
Interfaces	4 x USB host 2.0	
Optional interfaces (configuration option)	Without optional interface	Without optional interface 1x COM (RS-232), 1x COM (RS-485) 1x COM (RS-232), 1x COM (RS-485), 2x CAN
Slots	SD card	
Monitor output	without	
Network	2x Ethernet (10/100/1000 Mbps), RJ45	
Power supply	24 V DC ±20 %	
General data		
Degree of protection	IP65 (front), IP20 (back)	
Ambient temperature (operation)	0 °C ... 50 °C	
Permissible humidity (operation)	20 % ... 85 %	20 % ... 85 % (non-condensing)
Mounting type	Front installation	
Vibration (operation)	1g, according to EN 60068-2-6	DIN EN 60068-2-6
Shock	15g, according to IEC 60068-2-27	DIN EN 60068-2-27
EMC note	Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Panel PC			
	EL PPC5.7 1000	2404318	1
	EL PPC7 1000	2701481	1

22.9 cm (9") / 26.4 cm (10.4") display

30.7 cm (12.1") display

39.12 cm (15.4") / 38.1 cm (15") display

Technical data

EL PPC9 1000	EL PPC10S 1000
22.9 cm/9" TFT 800 x 480 pixels (WVGA)	26.4 cm/10.4" TFT 800 x 600 pixels (SVGA)
LED	
400 cd/m², typical (adjustable)	350 cd/m², typical (adjustable)
> 70000 h	> 50000 h
Analog resistive (polyester)	
without operating system Windows® Embedded Standard 7 Windows® Embedded Standard 7 SP1 (64-bit), Multi-language Windows® 7 Professional SP1 (32-bit), English Windows® 7 Professional SP1 (64-bit), English Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language AMD Embedded G-Series (T40R), 1.0 GHz AMD Embedded G-Series (T40E), 2x 1.0 GHz Intel® Atom™ E3845 1.91 GHz	
2 GB DDR3 4 GB DDR3	
without mass storage SATA DOM SSD (SLC), 8 GB SATA DOM SSD (SLC),16 GB SATA DOM SSD (SLC), 32 GB SATA DOM SSD (MLC), 64 GB	without mass storage SATA DOM SSD (SLC), 8 GB SATA DOM SSD (SLC),16 GB SATA DOM SSD (SLC), 32 GB SATA DOM SSD (MLC), 64 GB 2.5" SSD (MLC), 240 Gbyte
4 x USB host 2.0	
Without optional interface 1x COM (RS-232), 1x COM (RS-485) 1x COM (RS-232), 1x COM (RS-485), 2x CAN	
SD card without 2x Ethernet (10/100/1000 Mbps), RJ45 24 V DC ±20 %	
IP65 (front), IP20 (back) 0 °C ... 50 °C 20 % ... 85 % (non-condensing) Front installation DIN EN 60068-2-6 DIN EN 60068-2-27 Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
EL PPC9 1000	**2701482**	1
EL PPC10S 1000	**2400232**	1

Technical data

EL PPC12 1000	EL PPC12S 1000
30.73 cm / 12.1"-TFT 1280 x 800 pixels (WXGA)	30.7 cm / 12.1" TFT 800 x 600 pixels (SVGA)
LED	
320 cd/m² typical (adjustable)	350 cd/m², typical (adjustable)
> 50000 h	
Analog resistive (polyester)	
without operating system Windows® Embedded Standard 7 Windows® Embedded Standard 7 SP1 (64-bit), Multi-language Windows® 7 Professional SP1 (32-bit), English Windows® 7 Professional SP1 (64-bit), English Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language AMD Embedded G-Series (T40R), 1.0 GHz AMD Embedded G-Series (T40E), 2x 1.0 GHz Intel® Atom™ E3845 1.91 GHz	
2 GB DDR3 4 GB DDR3	
without mass storage SATA DOM SSD (SLC), 8 GB SATA DOM SSD (SLC),16 GB SATA DOM SSD (SLC), 32 GB SATA DOM SSD (MLC), 64 GB 2.5" SSD (MLC), 240 Gbyte	
4 x USB host 2.0	
Without optional interface 1x COM (RS-232), 1x COM (RS-485) 1x COM (RS-232), 1x COM (RS-485), 2x CAN	
SD card without 2x Ethernet (10/100/1000 Mbps), RJ45 24 V DC ±20 %	
IP65 (front), IP20 (back) 0 °C ... 50 °C 20 % ... 85 % (non-condensing) Front installation DIN EN 60068-2-6 DIN EN 60068-2-27 Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
EL PPC12 1000	**2701484**	1
EL PPC12S 1000	**2400233**	1

Technical data

EL PPC15 1000	EL PPC15S 1000
39.12 cm / 15.4"-TFT 1280 x 800 pixels (WXGA)	38.1 cm/15" TFT 1024 x 768 pixels (XGA)
LED	
360 cd/m² typical (adjustable)	320 cd/m² typical (adjustable)
> 50000 h	
Analog resistive (polyester)	
without operating system Windows® Embedded Standard 7 Windows® Embedded Standard 7 SP1 (64-bit), Multi-language Windows® 7 Professional SP1 (32-bit), English Windows® 7 Professional SP1 (64-bit), English Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language AMD Embedded G-Series (T40R), 1.0 GHz AMD Embedded G-Series (T40E), 2x 1.0 GHz Intel® Atom™ E3845 1.91 GHz	
2 GB DDR3 4 GB DDR3	
without mass storage SATA DOM SSD (SLC), 8 GB SATA DOM SSD (SLC),16 GB SATA DOM SSD (SLC), 32 GB SATA DOM SSD (MLC), 64 GB 2.5" SSD (MLC), 240 Gbyte	
4 x USB host 2.0	
Without optional interface 1x COM (RS-232), 1x COM (RS-485) 1x COM (RS-232), 1x COM (RS-485), 2x CAN	
SD card without 2x Ethernet (10/100/1000 Mbps), RJ45 24 V DC ±20 %	
IP65 (front), IP20 (back) 0 °C ... 50 °C 20 % ... 85 % (non-condensing) Front installation DIN EN 60068-2-6 DIN EN 60068-2-27 Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
EL PPC15 1000	**2701485**	1
EL PPC15S 1000	**2400234**	1

Valueline and Basicline panel PCs

Panel PCs with analog-resistive touch technology combine the advantages of a modern industrial PC with the operation and monitoring functions of a touch monitor. Typically installed in the front of the control cabinet, they provide monitoring and control directly on site.

Features:

– High system availability thanks to a fanless design or convection booster, suitable for industrial applications and absence of moving parts
– Powerful Intel® Celeron® and Core™ i processors
– Large-scale compatibility with open IT standards, numerous interfaces and operating system options
– Display sizes from 12" (SVGA) to 24" (Full HD)
– High graphic performance with Intel HD graphics 4000

Notes:

You can find additional information about industrial PCs and the corresponding accessories in the product area of our website at phoenixcontact.net/products.

Configurable panel PC with Intel® Celeron® N2930 technology

Ex:

Technical data

Display data	
Display (configuration option)	30.7 cm / 12.1" TFT 30.7 cm / 12.1"-TFT FRONT USB 38.1 cm / 15" TFT 38.1 cm / 15" TFT FRONT USB 38.1 cm / 15" TFT STAINLESS 38.1 cm / 15" TFT USB BK 43.0 cm / 17" TFT 43.0 cm / 17" TFT FRONT USB 47.0 cm / 18.5" TFT 48.3 cm / 19" TFT 48.3 cm / 19" TFT FRONT USB 54.6 cm / 21.5" TFT 60.9 cm / 24" TFT FRONT USB
Screen resolution	800 x 600 pixels (SVGA) 1024 x 768 pixels (XGA) 1280 x 1024 pixels (SXGA) 1366 x 768 pixels (WXGA) 1920 x 1080 pixels (Full HD)
Brightness	Dependent on configuration
Display backlight MTBF	Dependent on configuration
Touch technology	Analog resistive (polyester)
Computer data	
Processor	Intel® Celeron® N2930 1.83 GHz/2.16 GHz
RAM (configuration option)	4 GB DDR3 SODIMM 8 GB DDR3 SODIMM
Mass storage (configuration option)	without mass storage 16 GB SSD (SLC) 32 GB SSD (SLC) 2.5" SSD (MLC), 80 GB 2.5" SSD (MLC),160 GB 4 GB CFast® card 8 GB CFast® card 16 GB CFast® card 32 GB CFast® card 320 GB HDD 2.5" SATA
Interfaces	1x COM (RS-232/422/485) 3x USB 2.0 1x USB 3.0
Network	2x Ethernet (10/100/1000 Mbps), RJ45
Power supply	24 V DC ±20 %
General data	
Degree of protection	IP65 (front), IP20 (back)
Ambient temperature (operation)	-20 °C ... 55 °C (Configuration options can affect the operating temperature. See user manual for details)
Permissible humidity (operation)	5 % ... 95 % (non-condensing)
Mounting type	Front installation
Vibration (operation)	IEC 60068-2-27
Shock	15g, 11 ms impulse in accordance with IEC 60068-2-27
EMC note	Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Industrial panel PC (PPC) with resistive touch screen. Configurable options for display size, memory and mass storage.	**VL PPC 2000**	2402760	1
Industrial panel PC (PPC) with resistive touch screen. Preconfigured with display, 4 GB RAM, no mass storage or operating system - 38.1 cm (15") display - 43.2 cm (17") display			

Configurable panel PC with Intel® Core™ i3-4010U technology

Panel PC with Intel® Celeron® 1020E technology

Panel PC with Intel® Core™ i7-3555LE technology

Ex:

Technical data

30.7 cm / 12.1" TFT 30.7 cm / 12.1"-TFT FRONT USB 38.1 cm / 15" TFT 38.1 cm / 15" TFT FRONT USB 38.1 cm / 15" TFT STAINLESS 38.1 cm / 15" TFT USB BK 43.0 cm / 17" TFT 43.0 cm / 17" TFT FRONT USB 47.0 cm / 18.5" TFT 48.3 cm / 19" TFT 48.3 cm / 19" TFT FRONT USB 54.6 cm / 21.5" TFT 60.9 cm / 24" TFT FRONT USB	38.1 cm/15" TFT 43,2 cm / 17"-TFT	38.1 cm/15" TFT 43,2 cm / 17"-TFT
800 x 600 pixels (SVGA) 1024 x 768 pixels (XGA) 1280 x 1024 pixels (SXGA) 1366 x 768 pixels (WXGA) 1920 x 1080 pixels (Full HD)	1024 x 768 pixels (XGA) 1280 x 1024 pixels (SXGA)	1024 x 768 pixels (XGA) 1280 x 1024 pixels (SXGA)
Dependent on configuration	350 cd/m², typical (adjustable)	350 cd/m², typical (adjustable)
Dependent on configuration	> 50000 h	> 50000 h
Analog resistive (polyester)	Analog resistive (polyester)	Analog resistive (polyester)
Intel® Core™ i3-4010U 1.70 GHz	Intel® Celeron® 1020E 2.2 GHz	Intel® Core™ i7-3555LE 2.5/3.2 GHz
4 GB DDR3 SODIMM 8 GB DDR3 SODIMM 16 GB DDR3 SODIMM	4 GB DDR3 SODIMM 8 GB DDR3 SODIMM 16 GB DDR3 SODIMM	4 GB DDR3 SODIMM 8 GB DDR3 SODIMM 16 GB DDR3 SODIMM
without mass storage 16 GB SSD (SLC) 32 GB SSD (SLC) 2.5" SSD (MLC), 80 GB 2.5" SSD (MLC),160 GB 4 GB CFast® card 8 GB CFast® card 16 GB CFast® card 32 GB CFast® card 320 GB HDD 2.5" SATA	without mass storage 1GB CF Card 2 GB CF Card 4 GB CF Card 8 GB CF Card 16 GB CF Card 32 GB CF Card 16 GB SSD (SLC) 32 GB SSD (SLC) 320 GB HDD 2.5" SATA 2.5" SSD (MLC), 80 GB 2.5" SSD (MLC),160 GB	without mass storage 1GB CF Card 2 GB CF Card 4 GB CF Card 8 GB CF Card 16 GB CF Card 32 GB CF Card 16 GB SSD (SLC) 32 GB SSD (SLC) 320 GB HDD 2.5" SATA 2.5" SSD (MLC), 80 GB 2.5" SSD (MLC),160 GB
1x COM (RS-232/422/485) 3x USB 2.0 1x USB 3.0 2x Ethernet (10/100/1000 Mbps), RJ45	1x COM (RS-232/422/485) 2x COM (RS-232) 4x USB 2.0 2x Ethernet (10/100/1000 Mbps), RJ45	1x COM (RS-232/422/485) 2x COM (RS-232) 4x USB 2.0 2x Ethernet (10/100/1000 Mbps), RJ45
24 V DC ±20 %	24 V DC ±20 %	24 V DC ±20 %
IP65 (front), IP20 (back)	IP65 (front), IP20 (back)	IP65 (front), IP20 (back)
-20 °C ... 50 °C (Configuration options can affect the operating temperature. See user manual for details)	0 °C ... 45 °C	0 °C ... 45 °C
5 % ... 95 % (non-condensing) Front installation IEC 60068-2-27 15g, 11 ms impulse in accordance with IEC 60068-2-27 Class A product, see page 525	5 % ... 95 % (non-condensing) Front installation DIN EN 60068-2-6 15g, 11 ms in accordance with IEC 60068-2-27 Class A product, see page 525	5 % ... 95 % (non-condensing) Front installation DIN EN 60068-2-6 15g, 11 ms in accordance with IEC 60068-2-27 Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
VL PPC 3000	2400184	1

Type	Order No.	Pcs./Pkt.
BL PPC 3000	2701397	1
BL PPC15 3000	2701393	1
BL PPC17 3000	2701394	1

Type	Order No.	Pcs./Pkt.
BL PPC 7000	2701398	1
BL PPC15 7000	2701395	1
BL PPC17 7000	2701396	1

Valueline panel PCs

The new generation of Valueline panel PCs combines the latest technology and robust industrial design to create a powerful operation and monitoring device. With various display sizes and numerous configuration options, the new Valueline panel PC is the tailor-made IPC solution.

Your advantages:

– Multitouch capability with projected capacitive touchscreen technology
– Extremely robust, thanks to the industrial, fanless design
– Maintenance friendly with access to all important components

Notes:

You can find additional information about industrial PCs and the corresponding accessories in the product area of our website at phoenixcontact.net/products.

new

Configurable panel PC with 17.8 cm (7") display, with Intel® Atom™ E3845 technology

Technical data

Display data	
Display (configuration option)	17.8 cm/7" TFT
Screen resolution	800 x 480 pixels (WVGA)
Display lighting type	LED
Brightness	400 cd/m², typical (adjustable)
Display backlight MTBF	> 50000 h
Touch technology	Projective-capacitive, four-touch control
Computer data	
Operating system (configuration option)	without operating system Windows® 7 Professional SP1 (64-bit), German Windows® 7 Professional SP1 (64-bit), English Windows® 7 Ultimate SP1 (64 bit), Multi-language Windows® 7 Ultimate SP1 (32-bit), Multi-language Windows® 7 Professional SP1 (32-bit), English Windows® 7 Professional SP1 (32-bit), German Windows® Embedded Standard 7 SP1 (32-bit), Multi-language Windows® Embedded Standard 7 SP1 (64-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language
Processor	Intel® Atom™ E3845 1.91 GHz
RAM	4 GB DDR3
Mass storage (configuration option)	SATA DOM SSD (SLC), 8 GB SATA DOM SSD (SLC),16 GB SATA DOM SSD (SLC), 32 GB SATA DOM SSD (MLC), 64 GB
Interfaces	1x COM (RS-232/422/485) 2x USB 2.0 1x USB 3.0
Optional interfaces (configuration option)	Without optional interface 1x COM (RS-232), 1x COM (RS-485), 2x CAN 1x COM (RS-232), 1x COM (RS-485)
Slots	SD card
Monitor output	1x DisplayPort
Network	2x Ethernet (10/100/1000 Mbps), RJ45
Power supply	24 V DC ±20 %
General data	
Degree of protection	IP65 (front), IP30 (back)
Ambient temperature (operation)	0 °C ... 50 °C
Permissible humidity (operation)	20 % ... 85 % (non-condensing)
Mounting type	Front installation
Vibration (operation)	1g, according to EN 60068-2-6
Shock	DIN EN 60068-2-27
EMC note	Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Industrial panel PC (PPC) with projected-capacitive touch screen. Configurable options for display size and mass storage.	**VL2 PPC7 1000**	2403708	1

new

Configurable panel PC with 22.9 cm (9") display, with Intel® Atom™ E3845 technology

Technical data	
22.9 cm/9" TFT	
800 x 480 pixels (WVGA)	
LED	
400 cd/m², typical (adjustable)	
> 70000 h	
Projective-capacitive, four-touch control	
without operating system	
Windows® 7 Professional SP1 (64-bit), German	
Windows® 7 Professional SP1 (64-bit), English	
Windows® 7 Ultimate SP1 (64 bit), Multi-language	
Windows® 7 Ultimate SP1 (32-bit), Multi-language	
Windows® 7 Professional SP1 (32-bit), English	
Windows® 7 Professional SP1 (32-bit), German	
Windows® Embedded Standard 7 SP1 (32-bit), Multi-language	
Windows® Embedded Standard 7 SP1 (64-bit), Multi-language	
Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language	
Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language	
Intel® Atom™ E3845 1.91 GHz	
4 GB DDR3	
SATA DOM SSD (SLC), 8 GB	
SATA DOM SSD (SLC),16 GB	
SATA DOM SSD (SLC), 32 GB	
SATA DOM SSD (MLC), 64 GB	
1x COM (RS-232/422/485)	
2x USB 2.0	
1x USB 3.0	
Without optional interface	
1x COM (RS-232), 1x COM (RS-485), 2x CAN	
1x COM (RS-232), 1x COM (RS-485)	
SD card	
1x DisplayPort	
2x Ethernet (10/100/1000 Mbps), RJ45	
24 V DC ±20 %	
IP65 (front), IP30 (back)	
0 °C ... 50 °C	
20 % ... 85 % (non-condensing)	
Front installation	
1g, according to EN 60068-2-6	
DIN EN 60068-2-27	
Class A product, see page 525	

Ordering data		
Type	**Order No.**	Pcs./Pkt.
VL2 PPC9 1000	2403709	1

new

Configurable panel PC with 30.7 cm (12.1") display, with Intel® Atom™ E3845 technology

Technical data	
30.7 cm / 12.1" TFT	
1280 x 800 pixels (WXGA)	
LED	
320 cd/m² typical (adjustable)	
> 50000 h	
Projective-capacitive, four-touch control	
without operating system	
Windows® 7 Professional SP1 (64-bit), German	
Windows® 7 Professional SP1 (64-bit), English	
Windows® 7 Ultimate SP1 (64 bit), Multi-language	
Windows® 7 Ultimate SP1 (32-bit), Multi-language	
Windows® 7 Professional SP1 (32-bit), English	
Windows® 7 Professional SP1 (32-bit), German	
Windows® Embedded Standard 7 SP1 (32-bit), Multi-language	
Windows® Embedded Standard 7 SP1 (64-bit), Multi-language	
Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language	
Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language	
Intel® Atom™ E3845 1.91 GHz	
4 GB DDR3	
SATA DOM SSD (SLC), 8 GB	
SATA DOM SSD (SLC),16 GB	
SATA DOM SSD (SLC), 32 GB	
SATA DOM SSD (MLC), 64 GB	
1x COM (RS-232/422/485)	
2x USB 2.0	
1x USB 3.0	
Without optional interface	
1x COM (RS-232), 1x COM (RS-485), 2x CAN	
1x COM (RS-232), 1x COM (RS-485)	
SD card	
1x DisplayPort	
2x Ethernet (10/100/1000 Mbps), RJ45	
24 V DC ±20 %	
IP65 (front), IP30 (back)	
0 °C ... 50 °C	
20 % ... 85 % (non-condensing)	
Front installation	
1g, according to EN 60068-2-6	
DIN EN 60068-2-27	
Class A product, see page 525	

Ordering data		
Type	**Order No.**	Pcs./Pkt.
VL2 PPC12 1000	2403710	1

new

Configurable panel PC with Intel® Atom™ E3845 technology

Technical data	
39.6 cm/15.6" TFT	
47.0 cm / 18.5" TFT	
54.6 cm/21.5" TFT	
1366 x 768 pixels (WXGA)	
1920 x 1080 pixels (Full HD)	
LED	
300 cd/m², typical (adjustable)	
> 50000 h (Dependent on configuration)	
Projective-capacitive, ten-touch control	
without operating system	
Windows® 7 Professional SP1 (64-bit), German	
Windows® 7 Professional SP1 (64-bit), English	
Windows® 7 Ultimate SP1 (64 bit), Multi-language	
Windows® 7 Ultimate SP1 (32-bit), Multi-language	
Windows® 7 Professional SP1 (32-bit), English	
Windows® 7 Professional SP1 (32-bit), German	
Windows® Embedded Standard 7 SP1 (32-bit), Multi-language	
Windows® Embedded Standard 7 SP1 (64-bit), Multi-language	
Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language	
Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language	
Intel® Atom™ E3845 1.91 GHz	
4 GB DDR3	
without mass storage	
4 GB SSD (SLC)	
8 GB SSD (SLC)	
16 GB SSD (SLC)	
32 GB SSD (SLC)	
2.5" SSD (MLC), 80 GB	
2.5" SSD (MLC),160 GB	
2.5" SSD (MLC), 240 Gbyte	
2.5" SSD (MLC), 480 Gbyte	
320 GB HDD 2.5" SATA	
1x COM (RS-232/422/485)	
2x USB 2.0	
1x USB 3.0	
Without optional interface	
1x COM (RS-232), 1x COM (RS-485), 2x CAN	
1x COM (RS-232), 1x COM (RS-485)	
SD card	
1x DisplayPort	
2x Ethernet (10/100/1000 Mbps), RJ45	
24 V DC ±20 %	
IP65 (front), IP30 (back)	
0 °C ... 45 °C (with HDD)	
0 °C ... 50 °C (with SSD)	
20 % ... 85 % (non-condensing)	
Front installation	
1g with SSD, 0.5g with HDD, according to EN 60068-2-6	
DIN EN 60068-2-27	
Class A product, see page 525	

Ordering data		
Type	**Order No.**	Pcs./Pkt.
VL2 PPC 1000	2403047	1

Valueline panel PCs

The new generation of Valueline panel PCs combines state-of-the-art technology and robust industrial design into one high-performance operation and monitoring device. Various display sizes and numerous configuration options make the Valueline panel PC the tailor-made IPC solution.

Your advantages:

– Multitouch capability with projected capacitive touchscreen technology
– Extremely robust, thanks to the industrial, fanless design
– Maintenance friendly with access to all important components
– Can be extended via PCI/PCIe slot
– High data security, thanks to 2 forms of mass storage and RAID support

Notes:

You can find additional information about industrial PCs and the corresponding accessories in the product area of our website at phoenixcontact.net/products.

Configurable panel PC with Intel® Celeron® N2930 technology

Ex:

Technical data

Display data	
Display (configuration option)	39.6 cm/15.6" TFT 47.0 cm / 18.5" TFT 54.6 cm/21.5" TFT
Screen resolution	1366 x 768 pixels (WXGA) 1920 x 1080 pixels (Full HD)
Display lighting type	LED
Brightness	300 cd/m², typical (adjustable)
Display backlight MTBF	> 50000 h (Dependent on configuration)
Touch technology	Projective-capacitive, ten-touch control
Computer data	
Operating system (configuration option)	without operating system Windows® 7 Professional SP1 (64-bit), German Windows® 7 Professional SP1 (64-bit), English Windows® 7 Ultimate SP1 (64 bit), Multi-language Windows® 7 Ultimate SP1 (32-bit), Multi-language Windows® 7 Professional SP1 (32-bit), English Windows® 7 Professional SP1 (32-bit), German Windows® Embedded Standard 7 SP1 (32-bit), Multi-language Windows® Embedded Standard 7 SP1 (64-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language
Processor (configuration option)	Intel® Celeron® N2930 1.83 GHz/2.16 GHz
RAM (configuration option)	4 GB DDR3 SODIMM 8 GB DDR3 SODIMM
Mass storage (configuration option)	without mass storage 4 GB SSD (SLC) 8 GB SSD (SLC) 16 GB SSD (SLC) 32 GB SSD (SLC) 2.5" SSD (MLC), 80 GB 2.5" SSD (MLC),160 GB 320 GB HDD 2.5" SATA
Raid system	without Raid system
Interfaces	1x COM (RS-232/422/485) 4x USB 2.0
Optional interfaces (configuration option)	Without optional interface 2x COM (RS-232), 1x COM (RS-232/422/485)
Slots	PCI/PCIe optional
Monitor output	1x DisplayPort
Network	2x Ethernet (10/100/1000 Mbps), RJ45
Power supply	24 V DC ±20 %
General data	
Degree of protection	IP65 (front), IP30 (back)
Ambient temperature (operation)	0 °C ... 45 °C (with HDD) -20 °C ... 50 °C (with SSD)
Permissible humidity (operation)	5 % ... 95 % (non-condensing)
Mounting type	Front installation
Vibration (operation)	DIN EN 60068-2-6
Shock	15g, 11 ms in accordance with IEC 60068-2-27
EMC note	Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Industrial panel PC (PPC) with projected-capacitive touch screen. Configurable options for display size, RAM, and mass storage.	**VL2 PPC 2000**	2400334	1

new

Configurable panel PC with Intel® Core™ i3-4010U technology

Ex:

Technical data

39.6 cm/15.6" TFT
47.0 cm / 18.5" TFT
54.6 cm/21.5" TFT
1366 x 768 pixels (WXGA)
1920 x 1080 pixels (Full HD)
LED
300 cd/m², typical (adjustable)
> 50000 h (Dependent on configuration)
Projective-capacitive, ten-touch control
without operating system
Windows® 7 Professional SP1 (64-bit), German
Windows® 7 Professional SP1 (64-bit), English
Windows® 7 Ultimate SP1 (64 bit), Multi-language
Windows® 7 Ultimate SP1 (32-bit), Multi-language
Windows® 7 Professional SP1 (32-bit), English
Windows® 7 Professional SP1 (32-bit), German
Windows® Embedded Standard 7 SP1 (32-bit), Multi-language
Windows® Embedded Standard 7 SP1 (64-bit), Multi-language
Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language
Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language
Intel® Core™ i3-4010U 1.70 GHz
4 GB DDR3 SODIMM
8 GB DDR3 SODIMM
16 GB DDR3 SODIMM
without mass storage
4 GB SSD (SLC)
8 GB SSD (SLC)
16 GB SSD (SLC)
32 GB SSD (SLC)
2.5" SSD (MLC), 80 GB
2.5" SSD (MLC),160 GB
320 GB HDD 2.5" SATA
without Raid system
1x COM (RS-232/422/485)
2x USB 2.0
2x USB 3.0
Without optional interface
2x COM (RS-232), 1x COM (RS-232/422/485)
PCI/PCIe optional
2x DisplayPort
2x Ethernet (10/100/1000 Mbps), RJ45
24 V DC ±20 %
IP65 (front), IP30 (back)
0 °C ... 45 °C (with HDD)
-10 °C ... 50 °C (with SSD)
5 % ... 95 % (non-condensing)
Front installation
DIN EN 60068-2-6
15g, 11 ms in accordance with IEC 60068-2-27
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
VL2 PPC 3000	2400498	1

Configurable panel PC with Intel® Core™ i5-4300U technology

Ex:

Technical data

39.6 cm/15.6" TFT
47.0 cm / 18.5" TFT
54.6 cm/21.5" TFT
1366 x 768 pixels (WXGA)
1920 x 1080 pixels (Full HD)
LED
300 cd/m², typical (adjustable)
> 50000 h (Dependent on configuration)
Projective-capacitive, ten-touch control
without operating system
Windows® 7 Professional SP1 (64-bit), German
Windows® 7 Professional SP1 (64-bit), English
Windows® 7 Ultimate SP1 (64 bit), Multi-language
Windows® 7 Ultimate SP1 (32-bit), Multi-language
Windows® 7 Professional SP1 (32-bit), English
Windows® 7 Professional SP1 (32-bit), German
Windows® Embedded Standard 7 SP1 (32-bit), Multi-language
Windows® Embedded Standard 7 SP1 (64-bit), Multi-language
Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language
Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language
Intel® Core™ i5-4300U 1.9 GHz/2.9 GHz
4 GB DDR3 SODIMM
8 GB DDR3 SODIMM
16 GB DDR3 SODIMM
without mass storage
4 GB SSD (SLC)
8 GB SSD (SLC)
16 GB SSD (SLC)
32 GB SSD (SLC)
2.5" SSD (MLC), 80 GB
2.5" SSD (MLC),160 GB
320 GB HDD 2.5" SATA
without Raid system
1x COM (RS-232/422/485)
2x USB 2.0
2x USB 3.0
Without optional interface
2x COM (RS-232), 1x COM (RS-232/422/485)
PCI/PCIe optional
2x DisplayPort
2x Ethernet (10/100/1000 Mbps), RJ45
24 V DC ±20 %
IP65 (front), IP30 (back)
0 °C ... 45 °C (with HDD)
-20 °C ... 50 °C (with SSD)
5 % ... 95 % (non-condensing)
Front installation
DIN EN 60068-2-6
15g, 11 ms in accordance with IEC 60068-2-27
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
VL2 PPC 7000	2400346	1

Configurable panel PC with Intel® Core™ i7-6822EQ technology

Technical data

39.6 cm/15.6" TFT
47.0 cm / 18.5" TFT
54.6 cm/21.5" TFT
1366 x 768 pixels (WXGA)
1920 x 1080 pixels (Full HD)
LED
300 cd/m², typical (adjustable)
> 50000 h (Dependent on configuration)
Projective-capacitive, ten-touch control
without operating system
Windows® 7 Professional SP1 (64-bit), German
Windows® 7 Professional SP1 (64-bit), English
Windows® 7 Ultimate SP1 (64 bit), Multi-language
Windows® 7 Ultimate SP1 (32-bit), Multi-language
Windows® 7 Professional SP1 (32-bit), English
Windows® 7 Professional SP1 (32-bit), German
Windows® Embedded Standard 7 SP1 (32-bit), Multi-language
Windows® Embedded Standard 7 SP1 (64-bit), Multi-language
Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language
Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language
Intel® Core™ i7-6822EQ 2 GHz/2.8 GHz
4 GB DDR4 SODIMM
8 GB DDR4 SODIMM
16 GB DDR4 SODIMM
without mass storage
4 GB SSD (SLC)
8 GB SSD (SLC)
16 GB SSD (SLC)
32 GB SSD (SLC)
2.5" SSD (MLC), 80 GB
2.5" SSD (MLC),160 GB
320 GB HDD 2.5" SATA
without Raid system
1x COM (RS-232/422/485)
2x USB 2.0
2x USB 3.0
Without optional interface
2x COM (RS-232), 1x COM (RS-232/422/485)
PCI/PCIe optional
2x DisplayPort
2x Ethernet (10/100/1000 Mbps), RJ45
24 V DC ±20 %
IP65 (front), IP30 (back)
0 °C ... 45 °C (with HDD)
-20 °C ... 50 °C (with SSD)
5 % ... 95 % (non-condensing)
Front installation
DIN EN 60068-2-6
15g, 11 ms in accordance with IEC 60068-2-27
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
VL2 PPC 9000	2400500	1

Panel PCs with IP65

The panel PCs in the Designline range combine high-performance technology and an attractive design. They are narrow, feature IP65 protection and multi-touch capability, and are always close to the action as they can be installed quickly and easily directly on the machine.

Thanks to their fanless and energy-efficient design, they are the ideal solution for future operating concepts in industrial systems: easy maintenance, custom configuration, and robust.

Additional features:

– Single or multi-touch screen
– Energy-efficient Intel® Atom™ or Intel® Core™ i7 processors
– Can be configured individually
– Fully enclosed housing with IP65 protection
– Extended temperature range of -20°C to +55°C
– User-friendly handling thanks to the attractive and practical industrial design
– Easy access to all important components

Notes:

You can find additional information about industrial PCs and the corresponding accessories in the product area of our website at phoenixcontact.net/products.

Panel PC with IP65, with 38.1 cm (15") display and Intel® Atom™ E680T technology

Technical data

	DL PPC15 1000	DL PPC15M 1000
Display data		
Display	38.1 cm/15" TFT	
Screen resolution	1024 x 768 pixels (XGA)	
Display lighting type	LED	
Brightness	400 cd/m², typical (adjustable)	
Display backlight MTBF	> 50000 h	
Touch technology	Analog resistive, single-touch control	Projective-capacitive, two-touch control
Computer data		
Operating system (configuration option)	without operating system Windows® Embedded Standard 7 Windows® 7 Professional SP1 (32-bit), English Windows® 7 Professional SP1 (32-bit), German Windows® 7 Ultimate SP1 (32-bit), Multi-language	
Processor (configuration option)	Intel® Atom™ E680T 1.6 GHz	
RAM (configuration option)	2 GB DDR2 800	
Mass storage (configuration option)	without mass storage 16 GB SSD (SLC) 32 GB SSD (SLC) 2.5" SSD (MLC), 80 GB 2.5" SSD (MLC),160 GB 320 GB HDD 2.5" SATA	
Interfaces	1x COM (RS-232/422/485) 5x USB 2.0 1x Audio	
Slots	without slots	
Monitor output	without	
Network	2x Ethernet (10/100/1000 Mbps), RJ45	
Power supply	24 V DC ±20 %	
General data		
Degree of protection	IP65	
Ambient temperature (operation)	0 °C ... 45 °C (with HDD) -20 °C ... 55 °C (with SSD)	
Permissible humidity (operation)	5 % ... 95 %	5 % ... 95 % (non-condensing)
Mounting type	VESA MIS-D, 100	
Vibration (operation)	1g, according to EN 60068-2-6	
Shock	15g, 11 ms in accordance with IEC 60068-2-27	
EMC note	Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
IPC with IP65 protection with touch screen, enclosed housing			
- Analog resistive touch screen	**DL PPC15 1000**	2701665	1
- Projective capacitive touch screen	**DL PPC15M 1000**	2701666	1
High performance IPC with touch screen and IP65 housing			
- 38.1 cm (15") display			
- 47 cm (18.5") display			
- 54.6 cm (21.5") display			

Panel PC with IP65, with 38.1 cm (15") display and Intel® Core™ i7-4650U technology

Technical data

38.1 cm/15" TFT
1024 x 768 pixels (XGA)
LED
400 cd/m², typical (adjustable)
> 50000 h
Projective-capacitive, two-touch control

without operating system
Windows® 7 Professional SP1 (32-bit), German
Windows® 7 Professional SP1 (32-bit), English
Windows® 7 Professional SP1 (64-bit), German
Windows® 7 Professional SP1 (64-bit), English
Windows® 7 Ultimate SP1 (64 bit), Multi-language
Windows® 7 Ultimate SP1 (32-bit), Multi-language
Windows® Embedded Standard 7 SP1 (32-bit), Multi-language
Windows® Embedded Standard 7 SP1 (64-bit), Multi-language
Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language
Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language
Intel®Core™ i7-4650U 3.30 GHz
4 GB DDR3 SODIMM
8 GB DDR3 SODIMM
12 GB DDR3 SODIMM
without mass storage
4 GB SSD (SLC)
8 GB SSD (SLC)
16 GB SSD (SLC)
32 GB SSD (SLC)
2.5" SSD (MLC), 80 GB
2.5" SSD (MLC),160 GB
320 GB HDD 2.5" SATA
1x COM (RS-232/422/485)
4x USB 2.0
1x USB 3.0
1x Audio
without slots
without
2x Ethernet (10/100/1000 Mbps), RJ45
24 V DC ±20 %

IP65
0 °C ... 45 °C (with HDD)
-20 °C ... 55 °C (with SSD)
5 % ... 95 % (non-condensing)
VESA MIS-D, 100
1g with SSD, 0.5g with HDD, according to EN 60068-2-6
15g, 11 ms in accordance with IEC 60068-2-27
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
DL PPC15M 7000	2400017	1

Panel PC with IP65, with 47 cm (18.5") display and Intel® Core™ i7-4650U technology

Technical data

47 cm/18,5" TFT
1366 x 768 pixels (WXGA)
LED
300 cd/m², typical (adjustable)
> 50000 h
Projective-capacitive, ten-touch control

without operating system
Windows® 7 Professional SP1 (32-bit), German
Windows® 7 Professional SP1 (32-bit), English
Windows® 7 Professional SP1 (64-bit), German
Windows® 7 Professional SP1 (64-bit), English
Windows® 7 Ultimate SP1 (64 bit), Multi-language
Windows® 7 Ultimate SP1 (32-bit), Multi-language
Windows® Embedded Standard 7 SP1 (32-bit), Multi-language
Windows® Embedded Standard 7 SP1 (64-bit), Multi-language
Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language
Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language
Intel®Core™ i7-4650U 3.30 GHz
4 GB DDR3 SODIMM
8 GB DDR3 SODIMM
12 GB DDR3 SODIMM
without mass storage
4 GB SSD (SLC)
8 GB SSD (SLC)
16 GB SSD (SLC)
32 GB SSD (SLC)
2.5" SSD (MLC), 80 GB
2.5" SSD (MLC),160 GB
320 GB HDD 2.5" SATA
1x COM (RS-232/422/485)
4x USB 2.0
1x USB 3.0
1x Audio
without slots
without
2x Ethernet (10/100/1000 Mbps), RJ45
24 V DC ±20 %

IP65
0 °C ... 45 °C (with HDD)
-20 °C ... 55 °C (with SSD)
5 % ... 95 % (non-condensing)
VESA MIS-D, 100
1g with SSD, 0.5g with HDD, according to EN 60068-2-6
15g, 11 ms in accordance with IEC 60068-2-27
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
DL PPC18.5M 7000	2400015	1

Panel PC with IP65, with 54.6 cm (21.5") display and Intel® Core™ i7-4650U technology

Technical data

54.6 cm / 21.5" TFT
1920 x 1080 pixels (Full HD)
LED
300 cd/m², typical (adjustable)
> 50000 h
Projective-capacitive, ten-touch control

without operating system
Windows® 7 Professional SP1 (32-bit), German
Windows® 7 Professional SP1 (32-bit), English
Windows® 7 Professional SP1 (64-bit), German
Windows® 7 Professional SP1 (64-bit), English
Windows® 7 Ultimate SP1 (64 bit), Multi-language
Windows® 7 Ultimate SP1 (32-bit), Multi-language
Windows® Embedded Standard 7 SP1 (32-bit), Multi-language
Windows® Embedded Standard 7 SP1 (64-bit), Multi-language
Windows® 10 IoT Enterprise LTSB 2015 (32-bit), Multi-language
Windows® 10 IoT Enterprise LTSB 2015 (64-bit), Multi-language
Intel®Core™ i7-4650U 3.30 GHz
4 GB DDR3 SODIMM
8 GB DDR3 SODIMM
12 GB DDR3 SODIMM
without mass storage
4 GB SSD (SLC)
8 GB SSD (SLC)
16 GB SSD (SLC)
32 GB SSD (SLC)
2.5" SSD (MLC), 80 GB
2.5" SSD (MLC),160 GB
320 GB HDD 2.5" SATA
1x COM (RS-232/422/485)
4x USB 2.0
1x USB 3.0
1x Audio
without slots
without
2x Ethernet (10/100/1000 Mbps), RJ45
24 V DC ±20 %

IP65
0 °C ... 45 °C (with HDD)
-20 °C ... 55 °C (with SSD)
5 % ... 95 % (non-condensing)
VESA MIS-D, 100
1g with SSD, 0.5g with HDD, according to EN 60068-2-6
15g, 11 ms in accordance with IEC 60068-2-27
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
DL PPC21.5M 7000	2400016	1

Tablet PCs

Tablet PCs suitable for industrial use are the ideal solution for working on the go indoors and outdoors. The new generation offers improved processor power and Full HD displays. Thanks to optimized energy efficiency, you can operate the devices for up to eight hours.

Your advantages:

– Work on the go without interruption, as the battery can be replaced during operation
– Large visualization, thanks to 13.3" display with Full HD resolution
– Optimum performance for every application, thanks to Intel® Celeron® and Intel® Core™ processors
– Stable connections via WLAN and Bluetooth
– Sound and proven handling, thanks to enclosed monocoque frame

Notes:

You can find additional information about industrial PCs and the corresponding accessories in the product area of our website at phoenixcontact.net/products.

new

Configurable tablet PC with 33.8 cm (13.3") display

Technical data

Display data	
Display	33.8 cm/13.3" TFT
Screen resolution	1920 x 1080 pixels (Full HD)
Display lighting type	LED
Display backlight MTBF	> 50000 h
Touch technology	Projective-capacitive, ten-touch control
Computer data	
Operating system (configuration option)	without operating system Windows® 7 Ultimate (64-bit) Windows® 10 IoT Enterprise Windows® Embedded Standard 7 (64-bit)
Processor (configuration option)	Intel® Core™ i5 4300U 1.90 GHz Intel® Celeron® 2980U 1.60 Ghz
RAM (configuration option)	8 GB DDR3 4 GB DDR3 SODIMM
Mass storage	2.5" SSD, 120 GB (SATA)
Interfaces	2x USB 3.0 1x USB 3.0 inset WLAN 802.11 a/g/n Bluetooth 4.0 Class 1+2
Network	1x Ethernet (10/100/1000 Mbps), RJ45
Power supply	20 V/3.5 A external
General data	
Degree of protection	IP65 (on the front), IP53 (on the back)
Ambient temperature (operation)	0 °C ... 40 °C
Permissible humidity (operation)	10 % ... 85 % (non-condensing)
Mounting type	Mobile application

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Tablet PC - Configurable - Windows® 7 Ultimate (64-bit) - Windows® 7 Ultimate (64-bit), UMTS/LTE	**ITC 8113**	2403738	1
Tablet PC - Windows® Embedded Standard 7 (64-bit)			
Tablet PC - Windows® Embedded 8.1 Industry Pro (64-bit) - Windows® Embedded 8.1 Industry Pro (64-bit), UMTS/LTE			

Accessories

Charging station, for simultaneous charging of two batteries	**ITC 8113 CHARGING STATION**	2403081	1
Battery, with charge level indicator	**ITC 8113 RECHARGEABLE BATTERY**	2403082	1
Power supply, for tablet PC, charging station and port replicator	**ITC 8113 POWER SUPPLY**	2403083	1
Port replicator for tablet PC, can be rotated and tilted, with 1x Ethernet (10/100/1000 Mbps) RJ45 and 4 x USB 2.0	**ITC 8113 PORTREPLICATOR**	2403313	1
Handle	**ITC 8113 HANDLE**	2403314	1
3-point belt for tablet PC	**ITC 8113 CARRYING STRAP**	2404751	1
Transport case	**ITC 8113 TRANSPORT CASE**	2404752	1

new

Tablet PC with 33.8 cm (13.3") display, with Intel® Core™ i5 4300U technology

new

Tablet PC with 33.8 cm (13.3") display, with Intel® Celeron® 2980U technology

Technical data

33.8 cm/13.3" TFT
1920 x 1080 pixels (Full HD)
LED
> 50000 h
Projective-capacitive, ten-touch control
Windows® 7 Ultimate (64-bit)
Intel® Core™ i5 4300U 1.90 GHz
8 GB DDR3
2.5" SSD, 120 GB (SATA) 2x USB 3.0 1x USB 3.0 inset WLAN 802.11 a/g/n Bluetooth 4.0 Class 1+2 1x Ethernet (10/100/1000 Mbps), RJ45 20 V/3.5 A external
IP65 (on the front), IP53 (on the back) 0 °C ... 40 °C 10 % ... 85 % (non-condensing) Mobile application

Ordering data

Type	Order No.	Pcs./Pkt.
ITC 8113 PW7	2402961	1
ITC 8113 PW7U	2402962	1
ITC 8113 PWES8	2402963	1
ITC 8113 PWES8U	2402964	1

Accessories

ITC 8113 CHARGING STATION	2403081	1
ITC 8113 RECHARGEABLE BATTERY	2403082	1
ITC 8113 POWER SUPPLY	2403083	1
ITC 8113 PORTREPLICATOR	2403313	1
ITC 8113 HANDLE	2403314	1
ITC 8113 CARRYING STRAP	2404751	1
ITC 8113 TRANSPORT CASE	2404752	1

Technical data

33.8 cm/13.3" TFT
1920 x 1080 pixels (Full HD)
LED
> 50000 h
Projective-capacitive, ten-touch control
Windows® 7 Ultimate (64-bit)
Intel® Celeron® 2980U 1.60 Ghz
4 GB DDR3 SODIMM
2.5" SSD, 120 GB (SATA) 2x USB 3.0 1x USB 3.0 inset WLAN 802.11 a/g/n Bluetooth 4.0 Class 1+2 1x Ethernet (10/100/1000 Mbps), RJ45 20 V/3.5 A external
IP65 (on the front), IP53 (on the back) 0 °C ... 40 °C 10 % ... 85 % (non-condensing) Mobile application

Ordering data

Type	Order No.	Pcs./Pkt.
ITC 8113 SW7	2402957	1
ITC 8113 SW7U	2402958	1
ITC 8113 SWES7	2402979	1
ITC 8113 SWES8	2402959	1
ITC 8113 SWES8U	2402960	1

Accessories

ITC 8113 CHARGING STATION	2403081	1
ITC 8113 RECHARGEABLE BATTERY	2403082	1
ITC 8113 POWER SUPPLY	2403083	1
ITC 8113 PORTREPLICATOR	2403313	1
ITC 8113 HANDLE	2403314	1
ITC 8113 CARRYING STRAP	2404751	1
ITC 8113 TRANSPORT CASE	2404752	1

Monitors with touch function

The monitors with a modern industrial design and with multi-touch display are suitable for operating concepts where the processor unit and display unit are physically separated. Thanks to the different display sizes, you will find the right monitor for your application.

Your advantages:

– System enhanced by an attractive design
– Robust and sturdy, thanks to glass front suitable for industrial use
– Implementation of state-of-the-art operating concepts, thanks to multi-touch support
– Easy integration into existing systems, thanks to standardized interfaces

Flat panel monitor with projected-capacitive multi-touch screen

Technical data

Display data	
Display	39.6 cm/15.6" TFT
Screen resolution	1366 x 768 pixels (WXGA)
Display lighting type	LED
Brightness	300 cd/m², typical (adjustable)
Display backlight MTBF	> 50000 h
Touch technology	Projective-capacitive, ten-touch control
Power supply	24 V DC
General data	
Degree of protection	IP65 (front), IP20 (back)
Ambient temperature (operation)	-10 °C ... 60 °C
Permissible humidity (operation)	10 % ... 90 % (non-condensing)
Mounting type	VESA MIS-D, 100
Vibration (operation)	1g
Shock	15g, 11 ms impulse
EMC note	Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Flat panel monitor with projected-capacitive multi-touch screen			
- 39.6 cm (15.6") display	**BL FPM 15.6**	2402980	1
- 46.9 cm (18.5") display	**BL FPM 18.5**	2402981	1
- 54.6 cm (21.5") display	**BL FPM 21.5**	2400515	1

Monitors with touch function

Monitors with touch function are the ideal extension to the industrial PC: operation and monitoring without mouse and keyboard. The robust LCD devices can be used directly on the machine, e.g., as a remote operating solution. Thanks to their numerous interfaces, they provide the best possible connection to your industrial PC.

Your advantages:

– Intuitive operation without mouse or keyboard, thanks to touch function
– High shock resistance and electromagnetic compatibility, thanks to robust housing suitable for industrial applications
– Large-scale compatibility, thanks to open IT standards and numerous interfaces
– Individual solutions thanks to hardware adapted to customer requirements

Additional features:

– Monitors in various display sizes for connection to any industrial PC with VGA or DVI port
– Optional front USB interface provides additional connection options for I/O devices

Flat panel monitor with resistive touch screen

Technical data

Display data	
Display	30.7 cm / 12.1" TFT
Screen resolution	800 x 600 pixels (SVGA)
Display lighting type	CCFL
Brightness	400 cd/m², typical (adjustable)
Display backlight MTBF	> 50000 h
Touch technology	Analog resistive (polyester)
Power supply	24 V DC ±20 %
General data	
Degree of protection	IP65 (front), IP20 (back)
Ambient temperature (operation)	0 °C ... 55 °C
Permissible humidity (operation)	5 % ... 95 %
Mounting type	VESA MIS-D, 100/75, C
Vibration (operation)	DIN EN 60068-2-6
Shock	15g, 11 ms in accordance with IEC 60068-2-27
EMC note	Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Flat panel monitor with resistive touch screen			
- 30.7 cm (12.1") display	**VL FPM 12**	2913015	1
- 38.1 cm (15") display	**VL FPM 15**	2913017	1
- 43.2 cm (17") display	**VL FPM 17**	2913019	1
Flat panel monitor with resistive touch screen, with additional USB port on the front			
- 30.7 cm (12.1") display	**VL FPM 12U**	2913016	1
- 38.1 cm (15") display	**VL FPM 15U**	2913018	1
- 43.2 cm (17") display	**VL FPM 17U**	2913020	1
- 48.3 cm (19") display	**VL FPM 19U**	2913021	1

Accessories

Mounting kit, including hardware for installation			
- Panel installation	**VL PANEL MOUNTING KIT**	2913159	1
- Panel installation for 15" and 17" displays in heavier guage panels	**VL PANEL+ MOUNTING KIT**	2701177	1
Protective cover for 15" touchscreen	**VL 15" DISPLAY PROTECTIVE FOIL**	2913165	1

Web panels

The outdoor touch panels with the new processor generation and glass-film-glass touch technology provide performance and robustness for demanding applications. Thanks to C1D2 certification for extreme operating conditions, you can operate and monitor your system in any environment.

Web panels are inexpensive operator panels for basic operation and monitoring tasks.

Features:

– Display can be read in direct sunlight
– Resistant to UV and IR radiation
– Extended temperature range
– Weatherproof thanks to IP67 protection
– Resistant to environmental influences, such as salt spray, termites, and chemicals
– Can be operated when wearing work gloves

**Outdoor web panel
14.5 cm (5.7")/17.8 cm (7")
TFT color display**

Technical data

		WP 06T/WT	WP 07T/WT
Display data			
Display		14.5 cm/5.7" TFT active	17.8 cm/7" TFT
Screen resolution		320 x 240 pixels (QVGA)	800 x 480 pixels (WVGA)
Display lighting type		LED	
Brightness		400 cd/m², typical (adjustable)	350 cd/m², typical (adjustable)
Display backlight MTBF		40000 h	
Color spectrum		65536 colors	
Touch technology		Analog resistive (GFG), anti-reflective coating	
Computer data			
Operating systems		Windows® CE 5.0	
Processor		ARM9™, 184 MHz	
RAM		128 MB SDRAM	
Mass storage		64 MB Flash	
Interfaces		2x USB Host 2.0	
Network		1 x Ethernet (10/100 Mbps), RJ45	
Power supply		24 V DC ±20 %	
Dimensions			
External dimensions (front plate)	W / H / D	195 mm / 153 mm / 5 mm	234 mm / 173 mm / 5 mm
Installation cutout	W / H / D	161 mm / 119 mm / 42 mm	200 mm / 140 mm / 42 mm
General data			
Degree of protection		IP67 (front), IP20 (back)	
Ambient temperature (operation)		-20 °C ... 70 °C	
Mounting type		Front installation	
Vibration (operation)		DIN EN 60068-2-6	
Shock		DIN EN 60068-2-27	
EMC note			

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Web panel, extended temperature range			
- 10.92 cm (4.3") display			
- 14.5 cm (5.7") display	**WP 06T/WT**	2400163	1
- 17.8 cm (7") display	**WP 07T/WT**	2400164	1
- 30.7 cm (12.1") display			

Accessories

Mounting kit, including hardware for installation			
- panel installation	**HMI SCB MOUNTING KIT 8**	2701387	1

new

Outdoor touch panel
10.92 cm (4.3")/17.8 cm (7")
TFT color display

Ex:

Technical data

TP 3043W/WT	TP 3070W/WT
10.92 cm / 4.3"-TFT	17.8 cm/7" TFT
480 x 272 pixels (WQVGA)	800 x 480 pixels (WVGA)
LED	
385 cd/m² typical (adjustable)	400 cd/m², typical (adjustable)
40000 h	50000 h
262144 colors	16.7 million colors
Analog resistive (GFG)	
Windows® Embedded Compact 7	
ARM® Cortex®-A8, 1000 MHz	
1 MB SRAM	512 MB LPDDR SDRAM
1 GB NAND-Flash	
2x USB host 2.0	
1 x Ethernet (10/100 Mbps), RJ45	
24 V DC ±20 %	
171 mm / 131 mm / 5 mm	234 mm / 174 mm / 5 mm
136 mm / 96 mm / 42 mm	200 mm / 140 mm / 48 mm
IP67 (front), IP20 (back)	
-20 °C ... 70 °C	-32 °C ... 70 °C
Bolt fixing	
1g, according to EN 60068-2-6	
15g, according to IEC 60068-2-27	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
TP 3043W/WT	2404286	1
TP 3070W/WT	2403465	1

Accessories

HMI SCB MOUNTING KIT 6	2701385	1

new

Outdoor touch panel
14.5 cm (5.7")
TFT color display

Ex:

Technical data

14.5 cm/5.7" TFT active
640 x 480 pixels (VGA)
LED
400 cd/m², typical (adjustable)
40000 h
262144 colors
Analog resistive (GFG)
Windows® Embedded Compact 7
ARM® Cortex®-A8, 1000 MHz
512 MB LPDDR SDRAM
1 GB NAND-Flash
2x USB host 2.0
1 x Ethernet (10/100 Mbps), RJ45
24 V DC ±20 %
195 mm / 153 mm / 5 mm
161 mm / 119 mm / 42 mm
IP67 (front), IP20 (back)
-20 °C ... 70 °C
Bolt fixing
1g, according to EN 60068-2-6
15g, according to IEC 60068-2-27
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
TP 3057V/WT	2403464	1

Accessories

HMI SCB MOUNTING KIT 6	2701385	1

new

Outdoor touch panel
30.7 cm (12.1")
TFT color display

Ex:

Technical data

30.7 cm / 12.1" TFT
800 x 600 pixels (SVGA)
LED
360 cd/m² typical (adjustable)
50000 h
16.7 million colors
Analog resistive (GFG)
Windows® Embedded Compact 7
ARM® Cortex®-A8, 1000 MHz
512 MB LPDDR SDRAM
1 GB NAND-Flash
2x USB 2.0
1 x Ethernet (10/100 Mbps), RJ45
24 V DC ±20 %
359 mm / 280 mm / 5 mm
323 mm / 244 mm / 58 mm
IP67 (front), IP20 (back)
-30 °C ... 70 °C
Bolt fixing
1g, according to EN 60068-2-6
15g, according to IEC 60068-2-27
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
TP 3121S/WT	2403466	1

Accessories

HMI SCB MOUNTING KIT 8	2701387	1

Panel PCs

The outdoor panel PCs fit seamlessly into the existing range of panel PCs. The devices are designed for applications under extreme ambient conditions.

Features:

– Display can be read in direct sunlight
– Resistant to UV and IR radiation
– Extended temperature range
– Watertight thanks to IP67 degree of protection
– Resistant to environmental influences, such as salt spray and termites
– Resistant to chemicals, e.g., aggressive cleaning agents, deicers for aircraft
– Can be operated when wearing work gloves

17.8 cm (7") widescreen display

Technical data

Display data	
Display	17.8 cm/7" TFT
Screen resolution	800 x 480 pixels (WVGA)
Display lighting type	LED
Brightness	350 cd/m², typical (adjustable)
Display backlight MTBF	> 50000 h
Touch technology	Analog resistive (GFG)
Computer data	
Operating system (configuration option)	without operating system Windows® Embedded Standard 7
Processor	Intel® Atom™ E680T 1.6 GHz
RAM	2 GB DDR2 800
Mass storage (configuration option)	Flash SSD 8 GB Flash SSD 16 GB Flash SSD 32 GB Flash SSD 64 GB
Interfaces	4 x USB host 2.0
Optional interfaces (configuration option)	Without optional interface 1x COM (RS-232), 1x COM (RS-485)
Slots	SD card
Monitor output	without
Network	1x Ethernet (10/100/1000 Mbps), RJ45
Power supply	24 V DC ±20 %
General data	
Degree of protection (configuration options)	IP67 (front), IP20 (back) NEMA 4X
Ambient temperature (operation)	-20 °C ... 60 °C
Permissible humidity (operation)	20 % ... 85 % (non-condensing)
Mounting type	Front installation
Vibration (operation)	DIN EN 60068-2-6
Shock	DIN EN 60068-2-27
EMC note	Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Panel PC for outdoor applications			
	EL PPC7 1000/WT	**2400065**	1

30.5 cm (12.1") display

38.1 cm (15") display

Technical data

30.7 cm / 12.1" TFT
800 x 600 pixels (SVGA)
LED
400 cd/m², typical (adjustable)
> 50000 h
Analog resistive (GFG)
without operating system
Windows® Embedded Standard 7
Intel® Atom™ E680T 1.6 GHz
2 GB DDR2 800
Flash SSD 8 GB
Flash SSD 16 GB
Flash SSD 32 GB
Flash SSD 64 GB
4 x USB host 2.0
Without optional interface
1x COM (RS-232), 1x COM (RS-485)
SD card
without
1x Ethernet (10/100/1000 Mbps), RJ45
24 V DC ±20 %
IP67 (front), IP20 (back)
NEMA 4X
-20 °C ... 60 °C
20 % ... 85 % (non-condensing)
Front installation
DIN EN 60068-2-6
DIN EN 60068-2-27
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
EL PPC12 1000/WT	2400066	1

Technical data

38.1 cm/15" TFT
1024 x 768 pixels (XGA)
LED
350 cd/m², typical (adjustable)
> 50000 h
Analog resistive (GFG)
without operating system
Windows® Embedded Standard 7
Intel® Atom™ E680T 1.6 GHz
2 GB DDR2 800
Flash SSD 8 GB
Flash SSD 16 GB
Flash SSD 32 GB
Flash SSD 64 GB
4 x USB host 2.0
Without optional interface
1x COM (RS-232), 1x COM (RS-485)
SD card
without
1x Ethernet (10/100/1000 Mbps), RJ45
24 V DC ±20 %
IP67 (front), IP20 (back)
NEMA 4X
-20 °C ... 60 °C
20 % ... 85 % (non-condensing)
Front installation
DIN EN 60068-2-6
DIN EN 60068-2-27
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
EL PPC15 1000/WT	2400067	1

Touch panels

new

The powerful HMIs in the TPM 3000 series are designed for demanding use on ships. New display sizes, various configuration options, and a wide range of functions ensure user-friendly and reliable operation, monitoring, and alarms when seafaring.

Features:

– Light-absorbing front plates
– Dimmable backlight
– Certifications according to ABS, BV, DNV-GL, LR, RINA
– Certified compass safe distance according to DIN EN 60945
– Acoustic warning from integrated horn
– All common communication standards supported
– Floating output
– Display formats in 4:3 or 16:9
– Versions with black front incl. dimming buttons and horn or with silver front and no buttons

10.92 cm (4.3") TFT color display

DNV GL

Technical data

Display data		
Display		10,92 cm / 4,3"-TFT
Screen resolution		480 x 272 pixels (WQVGA)
Display lighting type		LED
Brightness		385 cd/m² typical (adjustable)
Display backlight MTBF		40000 s
Color spectrum		262144 colors
Touch technology		Analog resistive (polyester)
Computer data		
Operating systems		Windows® Embedded Compact 7
Processor		ARM® Cortex®-A8, 1000 MHz
RAM		512 MB LPDDR RAM
Mass storage		1 GB NAND-Flash
Interfaces		2x USB host 2.0
Optional interfaces (configuration option)		Without optional interface 1x COM (RS-232), 1x COM (RS-485) 1x COM (RS-232), 1x COM (RS-485), 2x CAN 2x CAN
User software (configuration option)		Visu+ Movicon™ MicroBrowser
Network		1 x Ethernet (10/100 Mbps), RJ45
Power supply		24 V DC ±20 %
Dimensions		
External dimensions (front plate)	W / H / D	140 mm / 118 mm / 5 mm
Installation cutout	W / H / D	132 mm / 110 mm / 53 mm
General data		
Degree of protection		IP65 (front), IP20 (back)
Ambient temperature (operation)		-20 °C ... 60 °C
Mounting type		Front installation
Vibration (operation)		1g, according to EN 60068-2-6
Shock		15g, according to IEC 60068-2-27
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Touch panel with graphics-capable display, for maritime applications - 10.92 cm (4.3") display - 14.5 cm (5.7") display - 17.8 cm (7") display - 26.4 cm (10.4") display - 30.7 cm (12.1") display - 38.1 cm (15") display	**TPM 3043**	2404516	1

Accessories

Stylus for touch screens	**TOUCH PEN**	2701379	1
USB memory stick, memory capacity 8 GB	**USB FLASH DRIVE**	2402809	1
CMOS battery	**HMI BATTERY**	2701383	1
Mounting kit, including hardware for installation - panel installation	**HMI SCB MOUNTING KIT 6**	2701385	1
Protective foil for touch screen	**7" DISPLAY PROTECTIVE FOIL**	2701374	1

new

14.5 cm (5.7") / 26.4 cm (10.4")
TFT color display

DNV GL

Technical data

TPM 3057	TPM 3105
14.5 cm/5.7" TFT active 640 x 480 pixels (VGA)	26.4 cm/10.4" TFT 800 x 600 pixels (SVGA)
LED	
400 cd/m², typical (adjustable) 40000 s	340 cd/m² typical (adjustable) 50000 h
262144 colors	
Analog resistive (polyester)	
Windows® Embedded Compact 7 ARM® Cortex®-A8, 1000 MHz 512 MB LPDDR RAM 1 GB NAND-Flash 2x USB host 2.0 Without optional interface 1x COM (RS-232), 1x COM (RS-485) 1x COM (RS-232), 1x COM (RS-485), 2x CAN 2x CAN Visu+ Movicon™ MicroBrowser 1 x Ethernet (10/100 Mbps), RJ45 24 V DC ±20 %	
168 mm / 147 mm / 5 mm 160 mm / 139 mm / 49 mm	328 mm / 265 mm / 5 mm 302 mm / 237 mm / 58 mm
IP65 (front), IP20 (back) -20 °C ... 60 °C Front installation 1g, according to EN 60068-2-6 15g, according to IEC 60068-2-27 Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
TPM 3057	2404517	1
TPM 3105	2404520	1

Accessories

TOUCH PEN	2701379	1
USB FLASH DRIVE	2402809	1
HMI BATTERY	2701383	1
HMI SCB MOUNTING KIT 8	2701387	1
10,4" DISPLAY PROTECTIVE FOIL	2701376	1

new

17.8 cm (7") / 30.7 cm (12.1")
TFT color display

DNV GL

Technical data

TPM 3070	TPM 3120
17.8 cm/7" TFT 800 x 480 pixels (WVGA)	30.7 cm / 12.1" TFT 1280 x 800 pixels (WXGA)
LED	
350 cd/m², typical (adjustable) 40000 s	320 cd/m² typical (adjustable) 50000 h
262144 colors	65536 colors
Analog resistive (polyester)	
Windows® Embedded Compact 7 ARM® Cortex®-A8, 1000 MHz 512 MB LPDDR RAM 1 GB NAND-Flash 2x USB host 2.0 Without optional interface 1x COM (RS-232), 1x COM (RS-485) 1x COM (RS-232), 1x COM (RS-485), 2x CAN 2x CAN Visu+ Movicon™ MicroBrowser 1 x Ethernet (10/100 Mbps), RJ45 24 V DC ±20 %	
203 mm / 165 mm / 5 mm 195 mm / 157 mm / 48 mm	336 mm / 252 mm / 5 mm 310 mm / 226 mm / 54 mm
IP65 (front), IP20 (back) -20 °C ... 60 °C Front installation 1g, according to EN 60068-2-6 15g, according to IEC 60068-2-27 Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
TPM 3070	2404518	1
TPM 3120	2404522	1

Accessories

TOUCH PEN	2701379	1
USB FLASH DRIVE	2402809	1
HMI BATTERY	2701383	1
HMI SCB MOUNTING KIT 8	2701387	1
12,1" DISPLAY PROTECTIVE FOIL	2701377	1

new

30.7 cm (12.1") / 38.1 cm (15")
TFT color display

DNV GL

Technical data

TPM 3121	TPM 3150
30.7 cm / 12.1" TFT 800 x 600 pixels (SVGA)	38.1 cm/15" TFT 1024 x 768 pixels (XGA)
LED	
360 cd/m² typical (adjustable) 50000 h	480 cd/m² typical (adjustable)
262144 colors	65536 colors
Analog resistive (polyester)	
Windows® Embedded Compact 7 ARM® Cortex®-A8, 1000 MHz 512 MB LPDDR RAM 1 GB NAND-Flash 2x USB host 2.0 Without optional interface 1x COM (RS-232), 1x COM (RS-485) 1x COM (RS-232), 1x COM (RS-485), 2x CAN 2x CAN Visu+ Movicon™ MicroBrowser 1 x Ethernet (10/100 Mbps), RJ45 24 V DC ±20 %	
340 mm / 285 mm / 5 mm 315 mm / 259 mm / 52 mm	400 mm / 338 mm / 5 mm 373 mm / 312 mm / 63 mm
IP65 (front), IP20 (back) -20 °C ... 60 °C Front installation 1g, according to EN 60068-2-6 15g, according to IEC 60068-2-27 Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
TPM 3121	2404521	1
TPM 3150	2404524	1

Accessories

TOUCH PEN	2701379	1
USB FLASH DRIVE	2402809	1
HMI BATTERY	2701383	1
HMI SCB MOUNTING KIT 8	2701387	1
15,0" DISPLAY PROTECTIVE FOIL	2701378	1

Panel PCs

Applications in shipbuilding place special demands on operation and monitoring. In order to satisfy these requirements, Phoenix Contact has developed a new range of panel PCs.

The devices meet GL, LR, BV, DNV, ABS, and EN 60945 approval, all of which are required for the shipbuilding industry.

Features:

– Light-absorbing front plates
– Dimmable backlight
– Floating output
– Certifications according to ABS, BV, DNV-GL, LR, RINA
– Certified compass safe distance according to DIN EN 60945
– All common communication standards supported
– Acoustic warning from integrated horn
– Slimline device design
– Powerful processor with realtime clock

17.8 cm (7") TFT color display

DNV GL

Technical data

	EL PPC7 1000/M	EL PPC7G 1000/M
Display data		
Display	17.8 cm/7" TFT	
Screen resolution	800 x 480 pixels (WVGA)	
Display lighting type	LED	
Brightness	350 cd/m², typical (adjustable)	
Display backlight MTBF	> 50000 h	
Touch technology	Analog resistive (polyester)	Analog resistive (GFG)
Computer data		
Operating system (configuration option)	without operating system Windows® Embedded Standard 7	
Processor	Intel® Atom™ E680T 1.6 GHz	
RAM	2 GB DDR2	
Mass storage (configuration option)	Flash SSD 8 GB Flash SSD 16 GB Flash SSD 32 GB Flash SSD 64 GB	
Interfaces	4 x USB host 2.0 Floating output for external sensors	
Optional interfaces	Without optional interface	
Slots	SD card	
Monitor output	without	
Network	2x Ethernet (10/100/1000 Mbps), RJ45	
Power supply	24 V DC ±20 %	
General data		
Degree of protection	IP65 (front), IP20 (back)	
Ambient temperature (operation)	0 °C ... 55 °C	
Permissible humidity (operation)	20 % ... 85 % (non-condensing)	
Mounting type	Front installation	
Vibration (operation)	DIN EN 60068-2-6	
Shock	DIN EN 60068-2-27	
EMC note	Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Panel PC, for maritime applications			
- Touch technology: analog-resistive	**EL PPC7 1000/M**	2400068	1
- Touch technology: analog-resistive (GFG)	**EL PPC7G 1000/M**	2400282	1

30.7 cm (12.1") TFT color display

38.1 cm (15") color TFT display

DNV GL

Technical data

EL PPC12 1000/M	EL PPC12G 1000/M
30.7 cm / 12.1" TFT	
1280 x 800 pixels (WXGA)	
LED	
400 cd/m², typical (adjustable)	
> 50000 h	
Analog resistive (polyester)	Analog resistive (GFG)
without operating system	
Windows® Embedded Standard 7	
Intel® Atom™ E680T 1.6 GHz	
2 GB DDR2	
Flash SSD 8 GB	
Flash SSD 16 GB	
Flash SSD 32 GB	
Flash SSD 64 GB	
4 x USB host 2.0	
Floating output for external sensors	
Without optional interface	
SD card	
without	
2x Ethernet (10/100/1000 Mbps), RJ45	
24 V DC ±20 %	
IP65 (front), IP20 (back)	
0 °C ... 55 °C	
20 % ... 85 % (non-condensing)	
Front installation	
DIN EN 60068-2-6	
DIN EN 60068-2-27	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
EL PPC12 1000/M	**2400069**	1
EL PPC12G 1000/M	**2400283**	1

DNV GL

Technical data

EL PPC15 1000/M	EL PPC15G 1000/M
38.1 cm/15" TFT	
1024 x 768 pixels (XGA)	
LED	
350 cd/m², typical (adjustable)	
> 50000 h	
Analog resistive (polyester)	Analog resistive (GFG)
without operating system	
Windows® Embedded Standard 7	
Intel® Atom™ E680T 1.6 GHz	
2 GB DDR2	
Flash SSD 8 GB	
Flash SSD 16 GB	
Flash SSD 32 GB	
Flash SSD 64 GB	
4 x USB host 2.0	
Floating output for external sensors	
Without optional interface	
SD card	
without	
2x Ethernet (10/100/1000 Mbps), RJ45	
24 V DC ±20 %	
IP65 (front), IP20 (back)	
0 °C ... 55 °C	
20 % ... 85 % (non-condensing)	
Front installation	
DIN EN 60068-2-6	
DIN EN 60068-2-27	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
EL PPC15 1000/M	**2400070**	1
EL PPC15G 1000/M	**2400284**	1

PC WORX
PLC Programming
BUFFER
REQUEST
DATA
PHOENIX CONTACT
INSPIRING INNOVATIONS
VISU+
SCADA Visuali
RESY+
Remote Control

Software

Software is the key to more efficient automation. Phoenix Contact offers software from configuration to system operation – intelligent solutions that guide you through every stage of the value added chain of your automation solution. All products interact perfectly and impress with their innovative functions and intuitive, user-friendly operation. In addition, a wide range of ready-to-use block libraries is also available.

Programming
Software products for programming, from small to medium-sized applications with small-scale controllers to complex system automation with high-end PLCs.

Visualization
Intelligent tools for designing operation and monitoring interfaces – in the control room or directly in the machine.

Device parameterization
Central and efficient – parameterize your field devices from the comfort of your PC.

Configuration, monitoring, diagnostics
Software tools for fast startup, constant monitoring, and reliable diagnostics.

Drivers and interfaces
Everything you need to connect additional systems to your automation solution.

Planning and configuration
Expert support with the planning and configuration of technical components. So that everything works together perfectly.

Remote control
Flexible solutions for controlling distributed automation units.

System simulation
Startup and testing made easy – in a completely virtual environment.

Marking software
Software tools for efficient marking – even in series production.

Product overview	**54**
Programming	
PC WORX EXPRESS/PC WORX	**56**
PC Worx Target for Simulink	**58**
Function blocks/libraries	**91**
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WebVisit	**59**
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Drivers and interfaces	
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Project+	**54**
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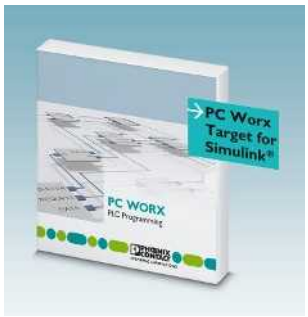
Portico	**68**
Resy+	**91**

Programming

PC Worx – software package for Phoenix Contact controllers programmed according to IEC 61131

Page 56



PC Worx Target for Simulink - firmware library

Page 58

Logic+ – intuitive programming software for quick and easy configuration
• See Catalog 5 - relay modules section

Your web code: #1104

SafetyProg – programming software for PROFIsafe controllers

Page 306

Functional and industry-specific software and drivers

Page 91

Visualization

WebVisit – development software for web-based visualizations

Page 59

Visu+ – SCADA visualization, development and runtime licenses

Page 60

Visu+ Express – free development software for HMI visualization

Page 61

Device parameterization

Startup+ – software for wiring checks on Axioline F I/O stations

Your web code: #1164

FL MGUARD DM ... – central management software for FL MGUARD devices

Page 440

SAFECONF – configuration software for TRISAFE and SafetyBridge modules

Page 304

PSR-CONF-WIN – configuration software for PSR-RSM4 with connecting cable

Page 305

Configuration, monitoring, and diagnostics

Config+ – tool for INTERBUS configuration and diagnostics
Page 62

Diag+ – diagnostics software for INTERBUS, PROFINET, and Ethernet networks
Page 64

Diag+ NetScan – diagnostics software for cyclic INTERBUS diagnostics
Page 64

FL VIEW – network diagnostics software
Page 440

Drivers and interfaces

OPC UA – communication interface for PC Worx-programmed controllers
Page 66

AX OPC server – communication interface for PC Worx-programmed controllers
Page 67

FL SNMP OPC server – monitoring/configuration of SNMP-compatible devices in HMI and SCADA systems
Page 67

Planning and configuration

Project+ – software for planning the I/O configuration

Your web code: #1161

Remote control

VL Portico server ... – remote control of networked IPCs
Page 68

Resy+ – function blocks for extending standard control and I/O components with remote control protocols
Page 91

Marking

CLIP PROJECT – planning and marking software
- See Catalog 3 – marking and labeling section

Your web code: #1093

System simulation

WinMOD AX ... – system software incl. INTERBUS/PROFINET IO simulation software
Info: www.winmod.com

IB Emulator – hardware required to simulate INTERBUS configurations with the WinMOD software
Order No. 2988638

Programming with PC WORX

PC Worx is the consistent engineering software for all controllers from Phoenix Contact. It combines programming according to IEC 61131, fieldbus configuration, and system diagnostics – in a single software solution. This provides optimum interaction between hardware and software.

The PC Worx engineering tool can be used in all areas of industry. From the outset the software has been developed and optimized as a uniform and user-friendly engineering environment for all controller classes.

The software includes all the programming languages defined in IEC 61131-3:

– Instruction List (IL)
– Function Block Diagram (FBD)
– Ladder Diagram (LD)
– Sequential Function Chart (SFC)
– Structured text (ST)

Efficient programming

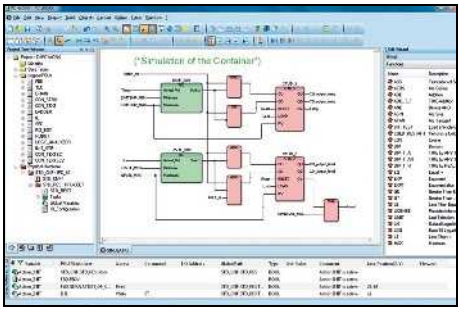
The PC Worx interface can be customized to your individual requirements with clearly arranged workspaces and toolbars. The basic languages of IEC 61131 (LD, FBD, and IL) can be directly and freely cross compiled. Structured text can be converted into any of the three basic languages.

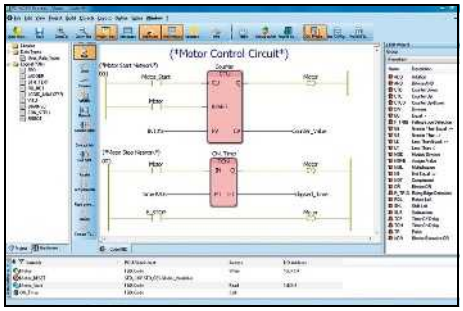
Wizards support and monitor the insertion of data types, function blocks, operator, and variable declarations in all editors. For text editors, another wizard is available for keywords and their command structures.

Startup and maintenance

During controller operation, the following functions round off IEC 61131 programming:

– Cross-references for editing
– Online and offline program comparison by all IEC editors and configuration data
– Startup functions
– Debug functions such as:
  - Logic analysis in realtime
  - Breakpoints
  - Address debugging
  - Step-by-step mode
  - Overwriting and forcing of variables





In order to test the program code, there is a powerful simulation tool for all Intel®-compatible controllers. This shortens the startup times of the real system.

All data configured in PC Worx can be reused for visualization purposes in an easy manner. This takes place via standard interfaces such as the AX OPC server or an integrated web server. The OPC and web server variables are selected with a mouse click.

Worldwide use assured

You can switch between numerous languages in the interface. Program comments can be exported and imported for translation. You can therefore save projects together with their comments in various languages.

Integrated password handling supports various protection models:

– Securing the project
– Protecting individual program organization units (POUs) against writing or reading - know-how protection
– Blocking of actions, e.g., starting/stopping the controller

I/O configuration

Network structures such as PROFINET, INTERBUS, PROFIBUS, and Modbus/TCP can be configured in PC Worx via an integrated bus configurator. A device catalog displays all components in clear groupings; the components can be transferred to the hardware configuration using drag & drop.

In connection view, the program variables are connected to the inputs and outputs of the network components. The variables are addressed automatically.

Diagnostics

The integrated Diag+ diagnostics tool is used to handle the diagnostics of all system components in the INTERBUS and PROFINET network. This tool enables precise error localization in the entire system.

Preventive diagnostic functions such as monitoring the transmission quality of fiber optic paths in INTERBUS systems increase system availability. Diagnostic data, causes of malfunctions, and solutions are displayed directly in plain text.

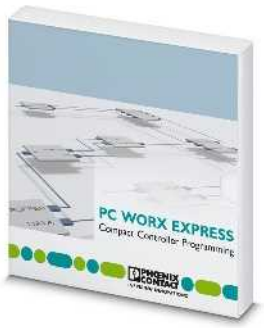
Programming environment for modular small-scale controllers

With PC Worx Express, Phoenix Contact provides a free engineering tool that can be used to easily program class 100 and 1000 modular small-scale controllers as well as the PC WORX SRT. This is made possible, among other things, by an even clearer user interface.

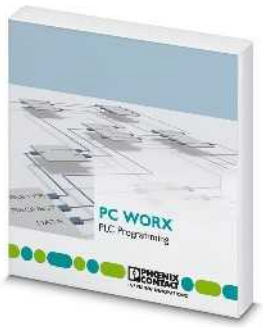
PC Worx Express offers numerous proven functions such as project creation, fast application development, plus easy download, monitoring, and startup of the PLC program. Intelligent automated functions speed up programming. These include the automatic insertion of program instances in the task or simplified variable handling.

PC Worx Express can be downloaded free of charge:
phoenixcontact.net/products

If the application requires the enhanced functions of PC Worx, the project created with PC Worx Express can be opened in the standard programming environment. You can transfer the configured data to PC Worx without any loss of data.



Free programming environment for modular small-scale controllers



Software package for Phoenix Contact controllers programmed as per IEC 61131

	Technical data	Technical data
Hardware requirements		
Processor	min. 2 GHz, x86 architecture	min. 2 GHz, x86 architecture
Main memory (RAM)	min. 2 Gbyte	min. 2 Gbyte
Hard disk memory	min. 2 Gbyte	min. 2 Gbyte
Optical drive	DVD-ROM	DVD-ROM
Operating equipment	Keyboard, mouse	Keyboard, mouse
Monitor resolution	SXGA (1280 x 1024)	SXGA (1280 x 1024)
Software requirements		
Operating systems	Windows® 7 Professional SP1 (32-bit/64-bit) Windows® 7 Ultimate SP1 (32-bit/64-bit) Windows® 8.1 Professional (32-bit/64-bit) Windows® 8.1 Enterprise (32-bit/64-bit) Windows® 10 (32-bit/64-bit), as of Build 1511	Windows® 7 Professional SP1 (32-bit/64-bit) Windows® 7 Ultimate SP1 (32-bit/64-bit) Windows® 8.1 Professional (32-bit/64-bit) Windows® 8.1 Enterprise (32-bit/64-bit) Windows® 10 (32-bit/64-bit), as of Build 1511
Supported browsers	Internet Explorer Version 8 or later	Internet Explorer Version 8 or later
Basic functions		
	Configuring an automation system, parameterizing INTERBUS devices, operating INTERBUS, programming an automation system according to IEC 61131-3, communication according to IEC 61131-5	Planning an automation system, parameterizing the INTERBUS and PROFINET devices, operating INTERBUS and PROFINET, programming an automation system in acc. with IEC 61131-3. communication in acc. with IEC 61131-5
	IEC 61131 includes the following programming languages: - Function block diagram (FBD), - Ladder diagram (LD), - Structured text (ST)	IEC 61131 includes the following programming languages: -Instruction list (IL), -Function block diagram (FBD), -Ladder diagram (LD), -Structured text (ST), -Symbolic flowchart (SFC)
	Network configuration (functionality of Config+)	Add-on to IEC 61131: Fixed Format Ladder Editor (FFLD) and Machine Sequential Function Chart language MSFC (from the license PC WORX PRO LIC onwards)
	Network diagnostics (functionality of Diag+)	Network configuration (functionality of Config+)
	-	Network diagnostics (functionality of Diag+)
Languages supported		
	German, English, French, Italian, Spanish, Chinese	German, English, French, Italian, Spanish, Chinese

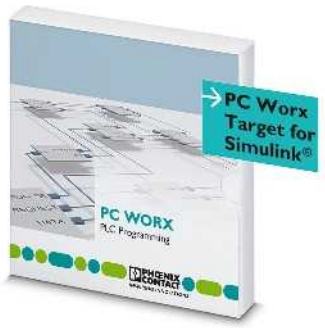
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Free programming version without license mechanism for class 100/1000 controllers and PC WORX SRT, 128 kbytes of I/O data	**PC WORX EXPRESS**	2988670	1			
Demo software with Quick Start Guide, 16 Byte input/output data, Diag+ limited to 5 devices				**PC WORX DEMO**	2985725	1
Basic license with 2048 bytes of I/O data, without MSFC compiler				**PC WORX BASIC LIC**	2985275	1
Full license with 128 kbyte input/output data, **with MSFC compiler included**				**PC WORX PRO LIC**	2985385	1
Low-cost upgrade of existing basic license to a full license				**PC WORX BASIC-PRO LIC**	2985259	1

PC Worx Target for Simulink

The **PC Worx Target for Simulink** firmware library allows you to integrate the functionalities of MATLAB/Simulink into the PC Worx programming software. Use this firmware library to connect MATLAB/Simulink models to RFC 470 and RFC 470S compact controllers from Phoenix Contact.

Your advantages:

– Structured program implementation and simulation/verification in advance, thanks to model-based system design
– Early-stage system simulation and startup by means of "hardware in the loop"
– Quick and easy system testing by means of "Rapid Prototyping"
– Maximized system performance by means of gradual tuning by optimized controls



Firmware library for integration of Simulink applications

Technical data

Software requirements	
Software requirements	MATLAB® andSimulink® R2012 and higher MATLAB® and Simulink® Coder Visual Studio 2008 Professional (includes Compiler for x86 and Windows® CE) PC WORX Version 6.30 or later

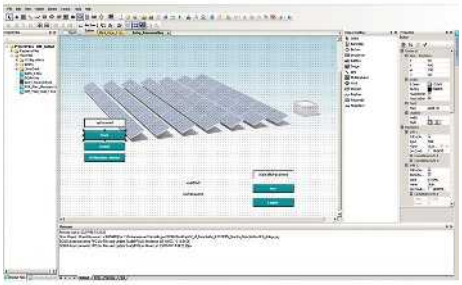
Ordering data

Description	Type	Order No.	Pcs./Pkt.
Firmware library, for connecting MATLAB/Simulink models for RFC 470/RFC 470S Remote Field Controllers	**PC WORX TARGET FOR SIMULINK**	2400041	1

Accessories

Remote Field Controller	**RFC 470 PN 3TX**	2916600	1
Safety controller	**RFC 470S PN 3TX**	2916794	1

WebVisit



Development software for web-based visualizations

WebVisit is the right solution for implementing your web-based visualization tasks. The software is flexible, inexpensive, and easy to operate. Thanks to HTML5, all you need to display your visualization application is a standard browser. This means that you can operate and monitor your system without having to install additional software.

All Phoenix Contact controllers offer an integrated web server which forwards control data. Use this data and design visualization pages using WebVisit. Your project is then saved directly on the controller.

Your advantages:

– Intuitive operation: user interfaces can be created quickly
– No programming knowledge is necessary for the creation of visualization pages
– Display of visualization pages in any standard browser, mobile browser, and all our web panels with integrated runtime environment
– Pay once for engineering and create as many pages as you like
– Optimum workflow integration thanks to data coupling with PC Worx and PC Worx Express

Technical data

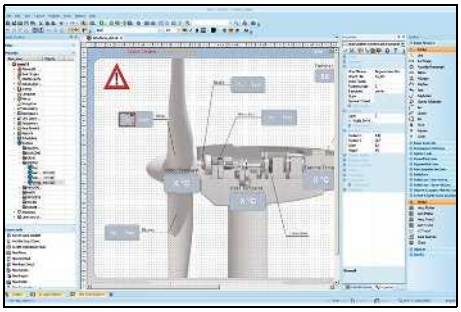
Hardware requirements	
Processor	min. Intel® Pentium® 4 / Celeron® 1.6 GHz
Main memory (RAM)	min. 2 Gbyte
Hard disk memory	min. 2 Gbyte
Optical drive	DVD-ROM
Operating equipment	Keyboard, mouse
Monitor resolution	XGA (1024 x 768)
Software requirements	
Operating systems	Windows® 7 Professional SP1 (32-bit/64-bit) Windows® 7 Ultimate SP1 (32-bit/64-bit) Windows® 8.1 Professional (32-bit/64-bit) Windows® 8.1 Enterprise (32-bit/64-bit) Windows® 10 (32-bit/64-bit)
Supported browsers	Internet Explorer Version 8 or later
Basic functions	
	The user interface has a functional design and even the basic version offers numerous graphic basic elements and functions. The variables needed for visualization are imported directly from PC Worx.
Languages supported	
	German, English, French

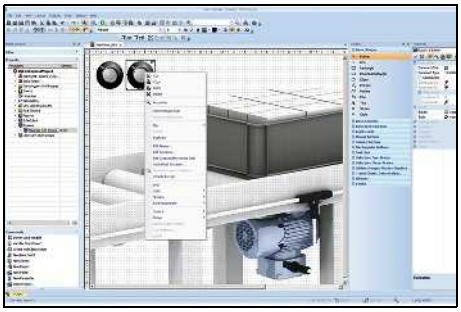
Ordering data

Description	Type	Order No.	Pcs./Pkt.
Development software for web-based visualizations	**WEBVISIT 6 BASIC**	2700948	1
Development software for web-based visualizations, with alarming, trending, and voice switchover	**WEBVISIT 6 PRO**	2700949	1
Free development software for up to ten web-based visualization pages	**WEBVISIT 6 EXPRESS**	2700954	1

Accessories

Upgrade license for upgrading from WEBVISIT 6 BASIC to WEBVISIT 6 PRO	**WEBVISIT 6 BASIC-PRO**	2700950	1





The **Visu+ 2** visualization software with SCADA functionality is suitable for every application: from a compact touch panel to an industrial PC. In addition to standard functions such as trend and alarm management, Visu+ offers comprehensive functions for alarm distribution and data logging with a link to external databases.

Visu+ 2 runs on Windows PCs as well as embedded platforms (Windows CE).

Touch panels from Phoenix Contact are already equipped with the runtime component for embedded devices.

Your advantages:

– Intelligent and intuitive editor for shorter development times
– Flexible license model
– Fully scalable process images for using one design on different devices and screen sizes
– Comprehensive graphical object and symbol libraries based on vector graphics
– Connection via OPC Classic interface
– All data comprehensively recorded, archived, and immediately available thanks to sophisticated data logger concept and connection to relational database systems
– Numerous possibilities for generating reports using a powerful and integrated report designer
– Web access via the Visu+ mobile app
– High availability thanks to integrated redundancy function
– FDA-validated projects can be implemented easily thanks to full support for the FDA CFR21 Part 11 specification
– Maximum flexibility, thanks to the wide range of driver interfaces for leading controller manufacturers

A good visualization software tool provides the basis for efficient automation, in production as well as directly on the machine. The free **Visu+ 2 Express** software provides an easy introduction to the visualization of typical operating and monitoring tasks.

Your advantages:

– No license fees
– Maximum flexibility, thanks to the wide range of driver interfaces for leading controller manufacturers
– Time and cost savings, thanks to the simplified user interface
– Fully scalable process diagrams for using one design on different devices and monitor sizes
– Web access via the Visu+ mobile app
– Connection via OPC Classic interface
– Scalable and fully upward compatible with Visu+ software
– Ideal for HMI applications

Mobile visualization

Extend your system visualization to smartphones or tablets with the **Visu+ mobile** visualization app from Phoenix Contact. You can design flexible operating and monitoring concepts, as the Visu+ mobile app allows you to access your system at any time and from any location.

The Visu+ license option required for the app is already enabled on numerous devices. These include the touch panels from Phoenix Contact.

Industrial PCs with a Visu+ runtime license simply need to be extended by adding the web license option.

Your advantages:

– Convenient: simply use smartphones or tablets for the visualization
– SCADA functions such as trend display or alarm handling also available on mobile devices
– Easy installation via Google Play Store or Apple App Store
– High-performance, scalable Visu+ web server: up to 100 clients can be operated simultaneously in its maximum configuration
– Easy handling: configuration only takes place in the Visu+ development environment

Visu+ 2 - license models

Find out more with the web code

You can find further information about runtime licenses for Visu+ on our website.

Simply enter # and numbers in the search field.

Your web code: #1298

SCADA visualization, development, and runtime licenses

Free development software for HMI visualization

	Technical data	Technical data
Hardware requirements		
Processor	Pentium/Celeron, 1.6 GHz	Pentium/Celeron, 1.6 GHz
Main memory (RAM)	min. 512 Mbyte (Recommended: 1 Gbyte)	min. 512 Mbyte (Recommended: 1 Gbyte)
Hard disk memory	min. 1 Gbyte (recommended: 2 Gbyte)	min. 1 Gbyte (recommended: 2 Gbyte)
Optical drive	DVD-ROM	DVD-ROM
Operating equipment	Keyboard, mouse	Keyboard, mouse
Monitor resolution	XGA (1024 x 768)	XGA (1024 x 768)
Software requirements		
Operating systems	Windows® XP (SP3) Windows® Vista Business Windows® 7 Professional SP1 (32-bit/64-bit) Windows® 7 Ultimate SP1 (32-bit/64-bit) Windows® 8 Professional (32-bit/64-bit) Windows® 8 Enterprise (32-bit/64-bit) Windows® Server 2003 Windows® Server 2008 Windows® Server 2008 R2 Windows® 10 (32-bit/64-bit)	Windows® XP (SP3) Windows® Vista Business Windows® 7 Professional SP1 (32-bit/64-bit) Windows® 7 Ultimate SP1 (32-bit/64-bit) Windows® 8 Professional (32-bit/64-bit) Windows® 8 Enterprise (32-bit/64-bit) Windows® Server 2003 Windows® Server 2008 Windows® Server 2008 R2 Windows® 10 (32-bit/64-bit)
Supported browsers	Internet Explorer 5.5 or higher	Internet Explorer 5.5 or higher
Basic functions		
	Know-How protection and safety through encryption of projects	Know-How protection and safety through encryption of projects
	Realtime database coupling with ODBC to MS ACCESS, MS EXCEL and SQL server	FDA CFR 21 Part 11 compatible
	FDA CFR 21 Part 11 compatible	OPC Classic Interface and direct drivers
Options		
	Statistical alarm function	Web client capability
	Web client capability	Extended alarm management with SMS and e-mail function
	Redundancy function	-
	Advanced alarm management with SMS, FAX, e-mail and voice mail function	-
	Networking	-
Languages supported		
	German, English, French, Italian	German, English, French, Italian

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Development license for **Visu+** projects	**VISU+ 2**	2988544	1			
Development environment for all touch panels with integrated runtime of the Visu+ visualization software				**VISU+ 2 EXPRESS**	2402774	1

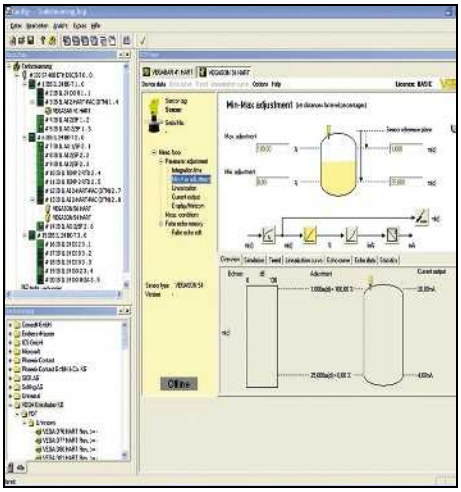
Config+ from Phoenix Contact is the ideal software solution for configuring INTERBUS networks.

The clear user interface allows you to assign addresses using drag & drop and to reliably configure even complex topologies. In addition, the Ethernet devices used can also be mapped and diagnosed. For reliable troubleshooting in INTERBUS networks, the integrated Diag+ diagnostics tool can be used.

Numerous functions for efficient configuration

In Config+, you can use a wide range of functions to efficiently configure systems with INTERBUS networks.

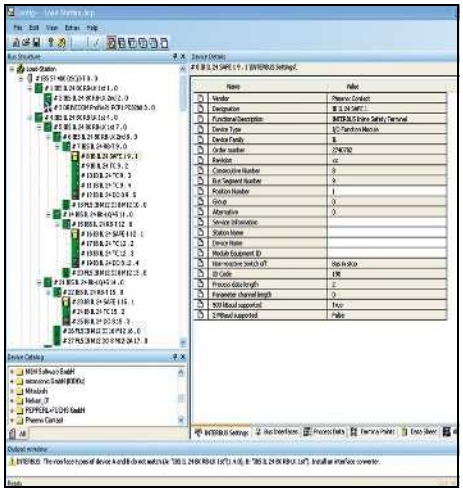
- Reading and comparing real and planned topology
- Address assignment via drag & drop or completely automatic
- Parameterization of several master boards and controller boards in one project
- Configuration of subsystems, e.g., lower-level robot systems
- Assignment and calling of external operating tools for intelligent devices
- Use of various (e.g., user-defined) device catalogs
- Import and export of device catalogs
- IP address assignment via BootP server
- Non-proprietary device parameterization using the FDT (field device technology) concept
- Monitoring function for wiring checks
- Topology data transfer to the SAFETYPROG safe programming tool



Comprehensive diagnostics for INTERBUS networks

Reliable diagnostics are essential for high system availability. INTERBUS networks can be diagnosed reliably with the Diag+ diagnostics tool integrated in Config+.

- Graphical display of error location in the network topology
- Output of plain text messages with tips for error removal
- Online display of device statuses
- Evaluation of statistical data for transmission quality
- Saving comments about error messages



Integrated diagnostics for Ethernet devices

With Diag+, you can also view additional diagnostic information on the Ethernet devices used in the network.

- Receive traps by means of the integrated trap receiver
- Graphical display of the Ethernet topology (2D view) showing the availability of devices
- Display of port statistics, error information on the devices, as well as other properties that can be read via SNMP
- Calling of device web pages

Tool for fieldbus and network configuration

Technical data

Hardware requirements	
Processor	min. 2 GHz, x86 architecture
Main memory (RAM)	min. 2 Gbyte
Hard disk memory	min. 2 Gbyte
Optical drive	DVD-ROM
Interfaces	Serial interface, Ethernet, PCI
Operating equipment	Keyboard, mouse
Monitor resolution	SXGA (1280 x 1024)
Software requirements	
Operating systems	Windows® 7 Professional SP1 (32-bit/64-bit) Windows® 7 Ultimate SP1 (32-bit/64-bit) Windows® 8.1 Professional (32-bit/64-bit) Windows® 8.1 Enterprise (32-bit/64-bit) Windows® 10 (32-bit/64-bit), as of Build 1511
Supported browsers	Internet Explorer Version 8 or later
Controller boards supported	
	IBS S7 400 DSC/I-T 2719962 IBS S7 300 DSC-T 2719975 IBS PCI SC/RI/I-T 2730080 IBS PCI SC/RI-LK 2730187 IBS PCI SC/I-T 2725260 IBS PCI SC-LK 2700318 FL IL 24 BK-B-PAC 2862327 FL IL 24 BK-PAC 2862314 FL NP PND-4TX IB 2985974 FL NP PND-4TX IB-LK 2985929 FLM BK ETH M12 DI 8 M12-2TX 2736916 IL ETH BK DI8 DO4 2TX-PAC 2703981 IBS USC4-2 2812209
Basic functions	
	Project transfer to SafetyProg (software tool for programming INTERBUS Safety) Project planning of Ethernet configurations Planning of the address assignment Transfer of the address settings (address ranges, assignment list) from Step 7® Project planning of multimaster projects (several bus configurations in one project) Comparison between real and planned bus configuration Online display of device data sheets Comprehensive diagnostic functions, including optical diagnostics with Diag+ Network diagnostics (functionality of Diag+)
Languages supported	
	German, English, French, Italian, Spanish, Chinese

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Config+ demo version with restricted range of function (it is not possible to save projects)	**CONFIG+ DEMO**	2868046	1
Config + full version for configuration and diagnosis of networks	**CONFIG+**	2868059	1

Accessories

Copy license, allows you to install the software multiple times. A full version is also required. Please specify the number of licenses required when ordering.	**CONFIG+ CPY**	2868062	1

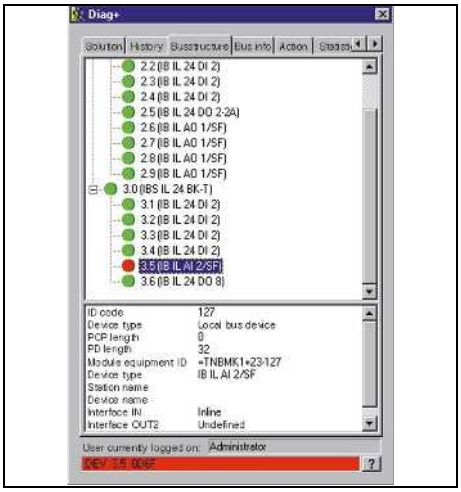
Comprehensive diagnostics for PROFINET and INTERBUS networks

Diag+ is a special diagnostics software tool that has been adapted to PROFINET and INTERBUS and indicates both network errors and the current states of controllers and devices. Preventive diagnostic functions such as monitoring the transmission quality of fiber optic (FO) paths in PROFINET and INTERBUS increase system availability.

Wide range of functions for reliable diagnostics

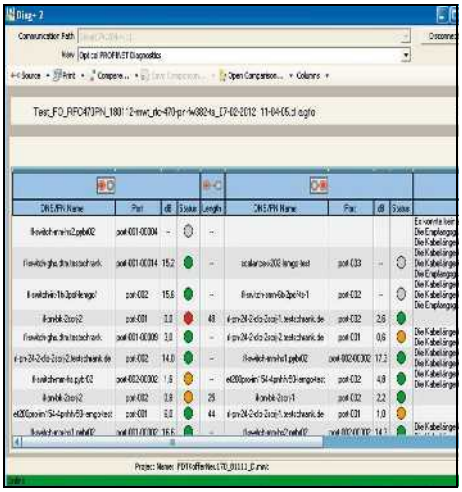
Status information, operating functions, plain text messages, and overviews ensure fast startup, error localization, and easy orientation in PROFINET and INTERBUS systems.

- Start and stop of INTERBUS data traffic
- Acknowledgment of INTERBUS error messages
- Bridging, switch on, and switch off of INTERBUS devices
- Display of error messages with tips for error removal and detailed information on the device type and device state
- Display of color symbols for errors and device states
- Preventive diagnostics such as monitoring transmission quality in FO paths
- Comparison and evaluation of FO diagnostic data records at varying times
- Generation of acceptance reports as PDF files
- Integration in other software tools such as visualizations
- Display of stored messages from the message archive of the controller
- Overview for the topology of Ethernet/PROFINET devices in a 2D graphic
- Specification of the accessibility of Ethernet/PROFINET devices
- Use of the configuration data and comments created with Config+ or PC Worx during the configuration phase (e.g., equipment IDs, station names)
- Management of individual rights of use for various users



Diag+ NetScan – software for cyclic INTERBUS network diagnostics

Diag+ NetScan enables simultaneous monitoring of INTERBUS networks with several controller boards/controllers. The transmission quality of all FO paths in an entire system is thus monitored permanently. Even lower-level buses connected using system couplers can be included in monitoring.



Ordering example 1:

The Diag+ software is to be used on ten different PCs of a system for PROFINET/INTERBUS network diagnostics.

Items required:

- 1x DIAG+
- 9x DIAG+ CPY

Ordering example 2:

Ethernet-networked INTERBUS controller boards (x 60) are to be monitored from a control room. In the event of an error, detailed diagnostic data should be displayed.

Items required:

- 1 x DIAG+ NETSCAN

Diagnostics software for INTERBUS, PROFINET and Ethernet networks

Diagnostics software for cyclic INTERBUS diagnostics

Technical data

Hardware requirements		
Processor	min. 2 GHz, x86 architecture	min. 2 GHz, x86 architecture
Main memory (RAM)	min. 2 Gbyte	min. 2 Gbyte
Hard disk memory	min. 2 Gbyte	min. 2 Gbyte
Optical drive	DVD-ROM	DVD-ROM
Interfaces	Serial interface, Ethernet, PCI	Serial interface, Ethernet, PCI
Supported controllers	INTERBUS generation 4 controller boards, PROFINET controller (Phoenix Contact only)	INTERBUS Generation 4 controller board
Software requirements		
Operating systems	Windows® 7 Professional SP1 (32-bit/64-bit) Windows® 7 Ultimate SP1 (32-bit/64-bit) Windows® 8.1 Professional (32-bit/64-bit) Windows® 8.1 Enterprise (32-bit/64-bit) Windows® 10 (32-bit/64-bit), as of Build 1511	Windows® 7 Professional SP1 (32-bit/64-bit) Windows® 7 Ultimate SP1 (32-bit/64-bit) Windows® 8.1 Professional (32-bit/64-bit) Windows® 8.1 Enterprise (32-bit/64-bit) Windows® 10 (32-bit/64-bit), as of Build 1511
Basic functions		
	Executing important commands (start/stop/...) Reading in the installed bus structure Detecting/representing error states (plain text from knowledge database) Saving diagnostics data in flash memory or parameterization memory of the controller board Diagnostics of INTERBUS FO paths (transmission quality) Can be linked into other 32-bit applications as ActiveX Control including programming interface for further processing of all INTERBUS diagnostic data Reading out the Controller Diagnose Archive Numerous other diagnostic functions	Executing important commands (start/stop/...) Reading in the installed bus structure Detecting/representing error states (plain text from knowledge database) Saving diagnostics data in flash memory or parameterization memory of the controller board Diagnostics of FO paths (transmission quality) Can be integrated into other 32-bit applications as ActiveX Control - -
Expanded functionality		
	- - -	Cyclical readout of diagnostic data from all INTERBUS controller boards/controllers in the network overview (the number of controller boards is not limited) Network overview: All INTERBUS controller boards/controllers in a system are clearly shown in a tree view; detailed diagnostics can be called up by clicking on the corresponding item Monitoring function: Simultaneous monitoring of up to 10 INTERBUS controller boards/controllers maximum
Languages supported		
	German, English, French, Italian, Spanish, Chinese	German, English, French, Italian, Spanish, Chinese

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Diag+ demo, limited scope of functions (only valid for the first five stations)	**DIAG+ DEMO**	2730734	1
Diag+ full version, for INTERBUS diagnostics (ActiveX Control with programming interface)	**DIAG+**	2730307	1
Diag+ NetScan-Demo, limited scope of functions (cannot open or save projects)			
Diag+ NetScan full version, for cyclic and simultaneous network diagnostics (ActiveX Control)			

Accessories

Copy license, allows you to install the software multiple times. A full version is also required. Please specify the number of licenses required when ordering.	**DIAG+ CPY**	2730404	1

Ordering data

Type	Order No.	Pcs./Pkt.
DIAG+ NETSCAN DEMO	2868091	1
DIAG+ NETSCAN	2868075	1

Accessories

Type	Order No.	Pcs./Pkt.
DIAG+ NETSCAN CPY	2868088	1

OPC server

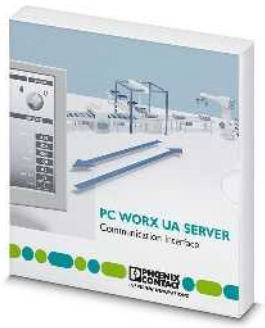
Implement data exchange quickly and reliably between the following devices using OPC servers:
– PC Worx-programmable controllers
– SNMP (Simple Network Management Protocol)-compatible devices

The standardized OPC UA (Unified Architecture) and OPC DA (Data Access) interfaces enable easy integration in OPC-compatible visualization and control systems.

The **PC WORX UA SERVER** supports the PLCopen profile for controllers according to the OPC UA standard. Variables and structures of PC Worx-programmable controllers are provided in a common address area.

The **AX OPC SERVER** operates according to the OPC DA standard and is used for data exchange between control systems, quality management systems or HMI stations with PC Worx-based controllers.

The **SNMP OPC SERVER V3** gathers device and network information which can be read via SNMP. In this way, you can integrate your SNMP-compatible devices in OPC-based process control systems (SCADA) or in HMI systems.



OPC UA - communication interface for PC Worx-programmable controllers

Technical data

Hardware requirements	
Processor	min. Intel® Core™ i3-2100 (2 GHz)
Main memory (RAM)	min. 2 Gbyte
Hard disk memory	-
Optical drive	-
Operating equipment	-
General requirements	
Operating systems	Windows® 7 (32-bit/64-bit) Windows® 8.1 (32-bit/64-bit) Windows® 10 (32-bit/64-bit) Windows® Server 2012
Software requirements	PC WORX Version 6 or later
Basic functions	
	Data exchange according to DA profile spec 1.02 (2012)
	Security Policies: None, Basic128RSA15, Basic256
	Message Security: Mode none, sign, sign&encrypt
	Communication profile according to the PC-based server via binary protocol using TCP/IP Easy access to arrays and structures Variable mapping according to PLCopen profile spec 1.00
Languages supported	
	English

Ordering data

Description	Type	Order No.	Pcs./Pkt.
OPC UA server for communication with a maximum of 10 modular small-scale controllers - ILC 1x1, AXC 1xxxx	**PC WORX UA SERVER-PLC 10**	2402684	1
OPC UA server for communication with a maximum of 25 controllers - ILC 1x1, AXC 1xxxx, AXC 3xxx, PC WORX RT BASIC/SRT	**PC WORX UA SERVER-PLC 40**	2402685	1
OPC UA server for communication with a maximum of 200 controllers - ILC 1x1, AXC 1xxxx, AXC 3xxx, RFC 460R, PC WORX RT BASIC/SRT	**PC WORX UA SERVER-PLC 80**	2402686	1
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers - ILC 1x1, AXC 1xxxx, ILC 3xx, AXC 3xxx, RFC 4xx, PC WORX RT BASIC/SRT			
SNMP OPC server, for monitoring and configuring a maximum of 100 SNMP-compatible devices in HMI and SCADA systems			
Extension license for 100 devices			

OPC DA - communication interface for PC Worx-programmable controllers

Monitoring/configuration of SNMP-compatible devices in HMI and SCADA systems

Technical data

min. Intel® Core™ i3-2100 (2 GHz)
min. 1 Gbyte (2 GB for Windows Vista and Windows 7)
min. 2 Gbyte
-
-
Windows® 7 Professional SP1 (32-bit/64-bit) Windows® 7 Ultimate SP1 (32-bit/64-bit) Windows® 8.1 Professional (32-bit/64-bit) Windows® 8.1 Enterprise (32-bit/64-bit) Windows® 10 (32-bit/64-bit), as of Build 1511
PC WORX Version 3 or later
Supports OPC standard functions and all the optional interfaces (in accordance with OPC spec. DA 1.0a and DA 2.04/2.05)
Simultaneous support to several controllers
Integrated OPC testing and diagnostics client
-
-
German, English

Technical data

PC Pentium > 266 MHz
-
min. 20 Mbyte
CD-ROM
Keyboard, mouse recommended
Windows XP SP3 WIndows 7 Windows® Server 2008 Windows® Server 2003 Windows® Vista Business
-
Monitoring and configuration of 100 SNMP-compatible devices in HMI/SCADA systems
Network monitoring with HMI/SCADA systems
SNMP Version v1 and v2c supported
OPC clients OPC Data Access 1.0A/2.0 or OPC Alarm and Events supported
Integrated MIB browser
Import/export and creation of device profiles supported, online and remote configuration possible via remote PCs
German, English

Ordering data

Type	Order No.	Pcs./Pkt.
AX OPC SERVER	2985945	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL SNMP OPC SERVER V3	2701139	1
FL SNMP OPC SERVER V3 LIC 100	2701138	1

Portico

Remote control software

Optimally tailor your operating concept to the requirements of your system. With the Portico software, you can install up to 16 thin clients exactly where you need them. If multiple employees based in various locations need to access the machine, you can design individual solutions in this way.

Portico is a remote control software tool that allows you to view and fully interact with the desktop of another industrial PC over a network. The software uses a client/server architecture that either supports point-to-point connection between a server and client or allows communication to be established between a server and multiple clients. Thanks to the unique assignment of access rights, your system is also protected against unauthorized access.

Portico can also be used in a production environment to visualize or control a machine or process at a remote location in the system.

Your advantages:

– Individual operation and monitoring concepts with up to 16 clients
– Simultaneous display of IPC screen information at several operating stations without server operating system
– Inexpensive, thanks to the use of thin clients
– Configuration tool for user-friendly management of access rights
– Fast screen and input response, thanks to communication via TCP/IP network protocol
– Low memory usage by server and client

System requirements:

– CPU type/class: x86
– Minimum CPU clock rate: 1.0 GHz
– Minimum RAM: 512 MB
– Minimum memory required for server: 100 MB
– Minimum memory required for client: 100 MB
– LAN rate: 100 Mbps
– Graphics requirements: unlimited

Technical data

Hardware requirements	
Processor	Atom™ or above
Main memory (RAM)	≥ 512 Mbyte (minimum)
Hard disk memory	≥ 100 Mbyte (minimum (client and server))
Software requirements	
Operating systems	Windows XP SP3 WIndows 7
Basic functions	
	Remote control software
Languages supported	
	German, English, French, Spanish, Italian

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Remote control			
- 1 client	**VL PORTICO SERVER 1 CLIENT**	2701453	1
- 4 clients	**VL PORTICO SERVER 4 CLIENT**	2701455	1
- 16 clients	**VL PORTICO SERVER 16 CLIENT**	2701456	1

PC WORX RT BASIC
Software PLC
PLC

Controllers

Suitable for all requirements
From distributed water supply to highly complex painting lines in the automotive industry – reliable and cost-effective automation with controllers from Phoenix Contact. The broad spectrum offers innovative control solutions from programmable logic modules to high-end controllers.

Programmable logic relay system
PLC logic is the first to combine logic, interface, and field connection levels in a single solution. This means that you can switch and control I/O signals using a single compact system.

Modular controllers in Axio format
Axiocontrol controllers are fast, robust, and user-friendly, i.e., they are all designed for maximum performance, easy handling, and use in harsh industrial environments.

Modular controllers in Inline format
Class 100 and 300 programmable logic controllers impress with their modular structure and resulting flexibility. You can find the right control solution for small to complex tasks.

Compact controllers
Automation at the highest level: the class 400 PLCs are high-performance high-end controllers for moderate to sophisticated tasks.

Software PLC
Two devices in one: utilize the available resources of your industrial PC and transform it into a powerful controller using the software PLC.

Product overview	**72**
Programmable logic relay system	**74**
Modular controllers	
Modular controllers in Axio format	**76**
Modular controllers in Inline format	**80**
Compact controllers	**87**
Software PLC	**88**
Starter kits	**90**
Function blocks	**91**
Services for automation	**92**

Programmable logic relay system

Programmable logic relay system
Page 74

Modular controllers in Axio format

Class 1000 small-scale controllers
Page 76

Class 3000 high-performance controllers
Page 77

Controller for the power industry
Page 78

Modular controllers in Inline format

Controller for building infrastructure
Page 79

Class 100 small-scale controllers
Page 80

Class 100 small-scale controllers for machine building
Page 82

Class 100 small-scale controllers for remote communication
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Compact controllers

Class 300 controllers
Page 84

Class 400 compact controllers
Page 87

Software PLC

PC WORX RT BASIC – software PLC with realtime extension
Page 88

PC WORX SRT – software PLC without realtime extension
Page 89

Starter kits

Starter kit for automation with small-scale controllers – PROFINET
Page 90

Starter kit for automation with small-scale controllers – INTERBUS
Page 90

Software for control technology

Functional and industry-specific software and drivers

Page 91

PC Worx – software package for Phoenix Contact controllers programmed according to IEC 61131

Page 56

PC Worx EXPRESS – free programming environment for class 100 modular small-scale controllers

Page 56

WebVisit – development software for web-based visualizations

Page 59

Services for automation

Services – hotline, on-site service, startup support, professional workshops

Page 92

Training – individual training concepts, training courses

Page 92

Engineering – configuration, programming, visualization, coaching

Page 92

I/O systems

I/O systems for the control cabinet (IP20)

Page 124

I/O systems for field installation (IP67)

Page 190

System cabling

• See Catalog 5 – system cabling for controllers

Your web code: #0702

AC charging controllers

• See Catalog 2 – Charging technology for E-Mobility

Your web code: #0501

Programmable logic relay system – PLC logic

The PLC logic programmable logic relay system combines logic, interface, and field connection levels in a single unit. It processes digital and analog input signals as well as logic functions and timer modules. With the PLC logic logic relay system you can implement small automation tasks easily, flexibly, and in a way that is highly compact. You can therefore replace conventional switching and control devices.

The system consists of the PLC-V8C logic modules, the PLC-INTERFACE relay system, and the Logic+ software.

Up to 16 I/O signals can be processed using the stand-alone logic modules on an overall width of just 50 mm. If more I/O signals are required, a maximum of 48 I/O signals can be linked using the basic and extension modules.

The logic modules are simply plugged into a row of eight PLC-INTERFACE terminal blocks. Assemble each channel individually as an input or output with relay or analog modules, depending on the application requirements.

Additional information:

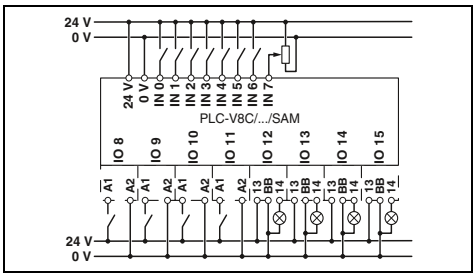
The complete product range for the PLC logic programmable logic relay system can be found in our Catalog 5 – Interface technology and switching devices.

Find out more with the web code

Detailed information on these products can be found on our website. Simply enter # and numbers in the search field.

#0687

Stand-alone module



Technical data

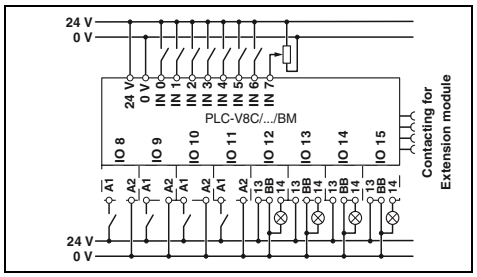
Supply	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 26.4 V DC
Maximum input current at U_N	160 mA
Input data (digital)	
Number of inputs	816 (2 configurable as analog)
Input voltage	24 V DC
Description of the input	EN 61131-2, type 3
Input current 0-signal	< 1 mA
Input current 1-signal	typ. 2.5 mA
Input data (analog)	
Number of inputs	210 (IN6 and IN7 are configurable as analog)
Input voltage range	0 V ... 10 V
Input resistance	> 3.5 kΩ
Input data (PLC-INTERFACE)	
Number of inputs	≤ 8
Output data (for controlling PLC-INTERFACE)	
Number of outputs	≤ 8
Nominal voltage	24 V DC
Nominal current	9 mA
Realtime clock (basic module only)	
Buffer time (capacitor)	96 h (Capacitor)
Realtime clock accuracy	±2 s/d
General data	
Ambient temperature (operation)	-20 °C ... 50 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Permissible humidity (operation)	95 %
Air clearances and creepage distances between the power circuits	DIN EN 50178
Rated insulation voltage	50 V
Rated surge voltage	0.8 kV
Insulation	Basic insulation
Mounting type	Can be plugged onto 8 x PLC-INTERFACE
Degree of protection	IP20
Screw connection solid/stranded/AWG	0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 28 - 16
Push-in connection solid/stranded/AWG	0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16

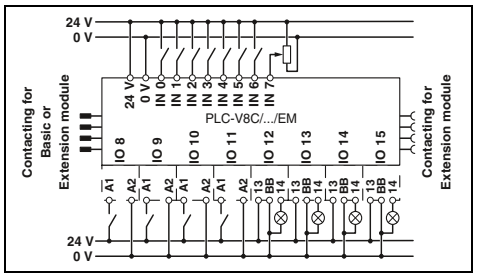
Ordering data

Description	Type	Order No.	Pcs./Pkt.
PLC-V8C plug-in logic modules			
with screw connection	**PLC-V8C/SC-24DC/SAM2**	2907445	1
with Push-in connection	**PLC-V8C/PT-24DC/SAM2**	2907443	1

Basic module
(can be extended)

Extension module





Technical data	
24 V DC	
19.2 V DC ... 26.4 V DC	
160 mA	
816 (2 configurable as analog)	
24 V DC	
EN 61131-2, type 3	
< 1 mA	
typ. 2.5 mA	
210 (IN6 and IN7 are configurable as analog)	
0 V ... 10 V	
> 3.5 kΩ	
≤ 8	
≤ 8	
24 V DC	
9 mA	
96 h (Capacitor)	
±2 s/d	
-20 °C ... 50 °C	
-20 °C ... 70 °C	
95 %	
DIN EN 50178	
50 V	
0.8 kV	
Basic insulation	
Can be plugged onto 8 x PLC-INTERFACE	
IP20	
0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 28 - 16	
0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16	

Technical data	
24 V DC	
19.2 V DC ... 26.4 V DC	
65 mA	
816 (2 configurable as analog)	
24 V DC	
EN 61131-2, type 3	
< 1 mA	
typ. 2.5 mA	
2 (IN6 and IN7 are configurable as analog)	
0 V ... 10 V	
> 3.5 kΩ	
≤ 8	
≤ 8	
24 V DC	
9 mA	
-	
-	
-20 °C ... 45 °C	
-20 °C ... 70 °C	
95 %	
DIN EN 50178	
50 V	
0.8 kV	
Basic insulation	
Can be plugged onto 8 x PLC-INTERFACE	
IP20	
0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 28 - 16	
0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16	

Ordering data

Type	Order No.	Pcs./Pkt.
PLC-V8C/SC-24DC/BM2	2907447	1
PLC-V8C/PT-24DC/BM2	2907446	1

Ordering data

Type	Order No.	Pcs./Pkt.
PLC-V8C/SC-24DC/EM	2903095	1
PLC-V8C/PT-24DC/EM	2905137	1

Class 1000 small-scale controllers

The AXC 1050 Axiocontrol controllers are fast, robust, and user-friendly, i.e., they are all designed for maximum performance, easy handling, and use in harsh industrial environments.

Together with the Axioline I/O systems they form a high-performance, flexible, and particularly resistant automation system for every requirement.

Thanks to the integrated UPS, you can respond promptly to any voltage failures. Push-in connection technology simplifies wiring noticeably and also saves time.

Your advantages:

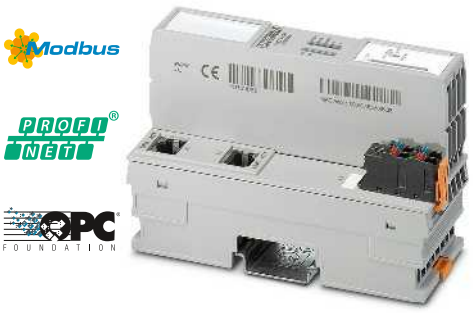
- Maximum flexibility - numerous I/Os and special function modules can be mounted side by side
- Cost-effective solution, thanks to the excellent price/performance ratio with high function density
- Optimum communication - with integrated, freely programmable web server for visualization with the WebVisit (HTML5, Java) or atvise® software
- Versatile use, as all common IT protocols are supported

Additional features:

- Continuous shock-resistant up to 10g
- Increased EMC robustness
- Micro USB interface: for fast startup or changing the PLC settings without knowing the IP address
- Modbus/TCP (client and server) is integrated in the firmware - this increases performance and simplifies configuration
- SD card slot: for quick memory expansion and easy enabling of software blocks
- FTP server
- Flash file system
- Complete Axiobus master
- Integration of IT standards: FTP, HTTP, HTTPS, SNMP, SMTP, SQL, ODP, OPC, and many more
- Intuitive programming using PC Worx or using the free PC Worx Express software (IEC 61131–3)
- Web-based management for easy diagnostics
- Integrated PROFINET controller and integrated PROFINET device

Notes:

You can find matching I/O modules for these controllers from page 98



Axiocontrol small-scale controller

Technical data

		AXC 1050	AXC 1050 XC
Interfaces			
Axioline F local bus		Bus base module	
Ethernet		2 x RJ45 socket	
Parameterization/operation/diagnostics		1 x Micro USB type B	
AXIOBUS master			
Number of supported devices		max. 63	
IEC-61131 runtime system			
Programming tool		PC WORX / PC WORX EXPRESS	
Processor		Altera Nios II 100 MHz	
Program memory		1 Mbyte	
Mass storage		2 Mbyte	
Retentive mass storage		48 kbyte (NVRAM)	
Number of data blocks		depends on mass storage	
Number of timers, counters		depends on mass storage	
Number of control tasks		8	
Realtime clock		Yes	
Power supply			
Supply voltage		24 V DC	
Supply voltage range		19.2 V DC ... 30 V DC	
Typical current consumption		125 mA	
General data			
Dimensions	W / H / D	45 mm / 125.9 mm / 74 mm	
Degree of protection		IP20	
Ambient temperature (operation)		-25 °C ... 60 °C	-40 °C ... 70 °C (Observe derating as per user manual)
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axiocontrol, complete with accessories (connector and marking field)			
	AXC 1050	2700988	1
- with extended temperature range	**AXC 1050 XC**	2701295	1

Accessories

Parameterization memory, flash card without license			
- 2 GB	**SD FLASH 2GB**	2988162	1
- 512 MB	**SD FLASH 512MB**	2988146	1
- 2 GB	**SD FLASH 2GB APPLIC A**	2701190	1
- 512 MB	**SD FLASH 512MB APPLIC A**	2701799	1
Programming cable			
	CAB-USB A/MICRO USB B/2,0M	2701626	1

Function blocks See page 91

Class 3000 high-performance controllers

The AXC 3050 is the high-end controller in the Axiocontrol range. It offers all the EMC, shock, and vibration properties of the AXC 1050, as well as Push-in connection technology and intelligent functions for sophisticated automation.

Thanks to the powerful processor and technology functions such as fast counters and event tasks, you can even implement complex applications reliably and efficiently.

Your advantages:

- Highly flexible, thanks to expansion with numerous I/O modules
- Communication in realtime via PROFINET
- Optimum connection, with integrated web server and support for all common IT standards
- Maximum performance, thanks to high processor speed

Additional features:

- Micro USB interface: for fast startup or changing the PLC settings without knowing the IP address
- 3 integrated Ethernet interfaces for implementing different topologies
- Modbus/TCP (client and server) is integrated in the firmware - this increases performance and simplifies configuration
- USB A interface for easy firmware update using a USB stick
- Integrated web server for visualization with WebVisit
- FTP server
- Flash file system
- Numerous protocols supported such as: HTTP, FTP, SNTP, SNMP, SMTP, SQL, MySQL, etc.
- Complete Axiobus master
- Integrated PROFINET controller and integrated PROFINET device

Notes:

You can find matching I/O modules for these controllers from page 98

Axiocontrol high-performance controller

Technical data

Interfaces		
Axioline F local bus		Bus base module
Ethernet		3 x RJ45 socket
Parameterization/operation/diagnostics		1 x Micro USB type B
AXIOBUS master		
Number of supported devices		max. 63
IEC-61131 runtime system		
Programming tool		PC WORX
Processor		Intel® Atom™ E660 1.3 GHz
Program memory		4 Mbyte
Mass storage		8 Mbyte
Retentive mass storage		128 kbyte
Number of data blocks		depends on mass storage
Number of timers, counters		depends on mass storage
Number of control tasks		16
Realtime clock		Yes
Power supply		
Supply voltage		24 V DC
Supply voltage range		19.2 V DC ... 30 V DC
Typical current consumption		typ. 408 mA (without I/Os and U_L = 24 V)
General data		
Dimensions	W / H / D	100 mm / 125.9 mm / 74 mm
Degree of protection		IP20
Ambient temperature (operation)		-25 °C ... 60 °C (up to 2000 m above mean sea level)
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axiocontrol, complete with accessories (connector and marking field)			
	AXC 3050	2700989	1

Accessories

Parameterization memory, flash card without license			
- 2 GB	**SD FLASH 2GB**	2988162	1
- 512 MB	**SD FLASH 512MB**	2988146	1
- 2 GB	**SD FLASH 2GB APPLIC A**	2701190	1
- 512 MB	**SD FLASH 512MB APPLIC A**	2701799	1
Programming cable			
	CAB-USB A/MICRO USB B/2,0M	2701626	1

Function blocks — **See page 91**

Controller for the power industry

Now you can also use the robust AXC 1050 controller for applications in the power industry.

The license on the SD card enables you to activate the communication protocol and quickly develop IEC-61850-compliant interfaces. The APPLIC A extension also gives you a license for further function block libraries.

Your advantages:

– Direct use of the IEC-61850 data model
– Flexible, thanks to freely programmable control functionality
– Simultaneous communication via Modbus/TCP and PROFINET

Additional features:

– Communication according to IEC 61850-5, MMS, and GOOSE
– Automatic time stamping

Notes:

You can find matching I/O modules for these controllers from page 98

new

IEC-61850 solution

Technical data

Interfaces		
Axioline F local bus		Bus base module
Ethernet		2 x RJ45 socket
Parameterization/operation/diagnostics		1 x Micro USB type B
AXIOBUS master		
Number of supported devices		max. 63
IEC-61131 runtime system		
Programming tool		PC WORX / PC WORX EXPRESS
Processor		Altera Nios II 100 MHz
Program memory		1 Mbyte
Mass storage		2 Mbyte
Retentive mass storage		48 kbyte (NVRAM)
Number of data blocks		depends on mass storage
Number of timers, counters		depends on mass storage
Number of control tasks		8
Realtime clock		Yes
Power supply		
Supply voltage		24 V DC
Supply voltage range		19.2 V DC ... 30 V DC
Typical current consumption		125 mA
General data		
Dimensions	W / H / D	45 mm / 125.9 mm / 74 mm
Degree of protection		IP20
Ambient temperature (operation)		-25 °C ... 60 °C
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axiocontrol, complete with accessories (connector and marking field)			
	AXC 1050	2700988	1
- with extended temperature range	**AXC 1050 XC**	2701295	1
Program and configuration memory, Flash card with license key for IEC-61850 communication			
- 2 GB	**SD FLASH 2GB 61850**	2400435	1
- 2 GB, with license key for activating further function block libraries	**SD FLASH 2GB APPLIC A 61850**	2400436	1

Accessories

Programming cable			
	CAB-USB A/MICRO USB B/2,0M	2701626	1

Function blocks — **See page 91**

Small-scale controllers for building infrastructure

You can use the ILC 2050 BI controller to automate different subsections in the building infrastructure, data centers, and distributed properties. The integrated Niagara Framework enables you to have IoT-based automation due to standardization of various data types.

Your advantages:
- Reduced startup costs thanks to different protocols
- Standardized integration of sensors and actuators
- Easy programming using drag & drop
- Web-based maintenance, monitoring, and programming from any location
- Functionality can be extended with the Inline I/O range

Additional features:
- Integrated safety functions
- Flexible licensing
- Supports numerous protocols: BACnet IP, BACnet MS/TP, KNX IP, SNMP, M-Bus, DALI, Modbus

Find out more with the web code

You can find further information about engineering software for building infrastructure on our website.

Simply enter # and numbers in the search field.

Your web code: #1166

Notes:

You can find matching I/O modules for these controllers from page 124

new

IoT-based networking of infrastructures

Technical data

Interfaces		
Ethernet		4 x RJ45 socket, shielded
RS-485		2 x Spring-cage connection
USB 2.0		1 x USB type A, socket / 1 x Mini-USB
Other interfaces		1 x microSD slot
AXIOBUS master		
Number of supported devices		max. 63
IEC-61131 runtime system		
Programming tool		Niagara 4
Processor		ARM® Cortex®-A8 1000 MHz
Program memory		512 kbyte (SRAM)
Mass storage		1.8 Gbyte (eMMC)
Retentive mass storage		2 Gbyte (eMMC)
Realtime clock		Yes
Power supply		
Supply voltage		24 V DC
Supply voltage range		19.2 V DC ... 30 V DC
Typical current consumption		≤ 170 mA (at nominal voltage without local bus device)
General data		
Dimensions	W / H / D	80 mm / 119.8 mm / 71.5 mm
Degree of protection		IP20
Ambient temperature (operation)		-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Small-scale controller			
	ILC 2050 BI	**2403160**	1

Accessories

Parameterization memory, flash card without license			
- 2 GB	**SD FLASH 2GB**	**2988162**	1
- 512 MB	**SD FLASH 512MB**	**2988146**	1
- 2 GB	**SD FLASH 2GB APPLIC A**	**2701190**	1
- 512 MB	**SD FLASH 512MB APPLIC A**	**2701799**	1
Programming cable			
	CAB-USB A/MICRO USB B/2,0M	**2701626**	1

Function blocks — **See page 91**

Class 100 small-scale controllers

Class 100 programmable logic controllers impress with their high function density. They support all common communication paths, such as Ethernet, mobile communication or fixed-line network.

Thanks to integrated Modbus/TCP and PROFINET, the controllers communicate with numerous fieldbus devices without any additional programming, both passively as a Modbus server as well as actively as a Modbus client.

As the interface between the control center and I/O level, they efficiently control the data flow within your system. In short, they are ideal for small to medium-sized applications, even in distributed systems.

Your advantages:

- Maximum flexibility - numerous I/Os and special function modules can be mounted side by side
- Quick and easy integration of additional user libraries with function blocks
- Optimum communication - with integrated, freely programmable web server for visualization with the WebVisit software
- Versatile use, as all common IT protocols are supported
- High processing speed thanks to the high-performance Altera NIOS II processor
- Easy to integrate in existing PROFINET networks by means of PROFINET device functionality

Additional features:

- Maximum flexibility in I/O connectivity thanks to integrated fieldbus master and Modbus/TCP (client and server)
- SD card slot: for quick memory expansion and easy enabling of software blocks
- FTP server
- Flash file system
- Numerous protocols supported such as: HTTP, FTP, SNTP, SNMP, SMTP, SQL, MySQL, etc.
- Intuitive programming using PC Worx or using the free PC Worx Express software
- The XC versions are also suitable for increased temperature requirements (-40°C to +60°C)

Notes:

You can find matching I/O modules for these controllers from page 124

Basic device

Ex:

Technical data

		ILC 131 ETH	ILC 131 ETH/XC
Interfaces			
INTERBUS local bus (master)		Inline data jumper	
Ethernet		1 x RJ45 socket	
Parameterization/operation/diagnostics		1 x 6-pos. MINI DIN socket (PS/2)	
INTERBUS master			
Number of devices with parameter channel		max. 8	
Number of supported devices		max. 63	
Amount of process data		max. 2048 bit (INTERBUS) max. 8192 bit (internal Modbus /TCP client)	
Digital inputs/outputs			
Number of inputs		8	
Number of outputs		4	
IEC-61131 runtime system			
Programming tool		PC WORX / PC WORX EXPRESS	
Processor		Altera Nios II 64 MHz	
Program memory		192 kbyte	
Mass storage		192 kbyte	
Retentive mass storage		8 kbyte (NVRAM)	
Number of data blocks		depends on mass storage	
Number of timers, counters		depends on mass storage	
Number of control tasks		8	
Realtime clock		Yes	
Power supply			
Supply voltage		24 V DC	
Supply voltage range		19.2 V DC ... 30 V DC	
Typical current consumption		210 mA	
General data			
Dimensions	W / H / D	80 mm / 119.8 mm / 71.5 mm	
Degree of protection		IP20	
Ambient temperature (operation)		-25 °C ... 55 °C	-40 °C ... 60 °C
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Small-scale controller, complete with accessories (connector and marking field)			
	ILC 131 ETH	**2700973**	1
- with extended temperature range	**ILC 131 ETH/XC**	**2701034**	1

Accessories

- 2 GB	**SD FLASH 2GB**	**2988162**	1
- 512 MB	**SD FLASH 512MB**	**2988146**	1
- 2 GB	**SD FLASH 2GB APPLIC A**	**2701190**	1
- 512 MB	**SD FLASH 512MB APPLIC A**	**2701799**	1
Programming cable			
	COM CAB MINI DIN	**2400127**	1
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers			
- ILC 1x1, AXC 1xxxx, ILC 3xx, AXC 3xxx, RFC 4xx, PC WORX RT BASIC/SRT	**AX OPC SERVER**	**2985945**	1

Function blocks — **See page 91**

With remote bus support

With two Ethernet ports

With integrated floating-point arithmetic

Ex:

Technical data

ILC 151 ETH	ILC 151 ETH/XC
Inline data jumper 1 x RJ45 socket 1 x 6-pos. MINI DIN socket (PS/2)	
max. 16 max. 128 max. 4096 bit (INTERBUS) max. 16384 bit (internal Modbus /TCP client)	
8 4	
PC WORX / PC WORX EXPRESS Altera Nios II 64 MHz 256 kbyte 256 kbyte 8 kbyte (NVRAM) depends on mass storage depends on mass storage 8 Yes	
24 V DC 19.2 V DC ... 30 V DC 210 mA	
80 mm / 119.8 mm / 71.5 mm IP20 -25 °C ... 55 °C	-40 °C ... 60 °C
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
ILC 151 ETH	2700974	1
ILC 151 ETH/XC	2701141	1

Accessories

SD FLASH 2GB	2988162	1
SD FLASH 512MB	2988146	1
SD FLASH 2GB APPLIC A	2701190	1
SD FLASH 512MB APPLIC A	2701799	1
COM CAB MINI DIN	2400127	1
AX OPC SERVER	2985945	1

See page 91

Technical data

Inline data jumper 2 x RJ45 socket 1 x 6-pos. MINI DIN socket (PS/2)
max. 24 max. 128 max. 4096 bit (INTERBUS) max. 32768 bit (internal Modbus /TCP client)
8 4
PC WORX / PC WORX EXPRESS Altera Nios II 64 MHz 512 kbyte 512 kbyte 48 kbyte (NVRAM) depends on mass storage depends on mass storage 8 Yes
24 V DC 19.2 V DC ... 30 V DC 210 mA
80 mm / 119.8 mm / 71.5 mm IP20 -25 °C ... 55 °C
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
ILC 171 ETH 2TX	2700975	1

Accessories

SD FLASH 2GB	2988162	1
SD FLASH 512MB	2988146	1
SD FLASH 2GB APPLIC A	2701190	1
SD FLASH 512MB APPLIC A	2701799	1
COM CAB MINI DIN	2400127	1
AX OPC SERVER	2985945	1

See page 91

Technical data

Inline data jumper 2 x RJ45 socket 1 x 6-pos. MINI DIN socket (PS/2)
max. 24 max. 128 max. 4096 bit (INTERBUS) max. 32768 bit (internal Modbus /TCP client)
8 4
PC WORX / PC WORX EXPRESS Altera Nios II 64 MHz 1 Mbyte 1 Mbyte 48 kbyte (NVRAM) depends on mass storage depends on mass storage 8 Yes
24 V DC 19.2 V DC ... 30 V DC 210 mA
80 mm / 119.8 mm / 71.5 mm IP20 -25 °C ... 55 °C
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
ILC 191 ETH 2TX	2700976	1

Accessories

SD FLASH 2GB	2988162	1
SD FLASH 512MB	2988146	1
SD FLASH 2GB APPLIC A	2701190	1
SD FLASH 512MB APPLIC A	2701799	1
COM CAB MINI DIN	2400127	1
AX OPC SERVER	2985945	1

See page 91

Class 100 small-scale controllers for machine building

The ME versions of the modular small-scale controllers have been specifically developed for the requirements of machine building. For example, for addressing drives via step motor drivers or frequency inverters.

The small-scale controllers offer all the functions of the ILC 1x1 and come with pre-installed functions for machine building. This means that various drive types can be controlled and sensors can be connected without any additional external modules.

Depending on the version, analog or incremental input channels can be used for position detection.

With Modbus/RTU and Easy Motion function block libraries, you can use the RS-485 and pulse/direction interface for positioning on simple 1-axis applications. The function block libraries are available to download free of charge.

Additional features:
– PWM/pulse/direction interface, RS-485

ILC 191 ME/INC:
– 2 fast counters
– Incremental encoders

ILC 191 ME/AN:
– 2 analog inputs
– 2 analog outputs

Notes:
You can find matching I/O modules for these controllers from page 124

For easy drive control

Technical data

		ILC 191 ME/AN	ILC 191 ME/INC
Interfaces			
INTERBUS local bus (master)		Inline data jumper	
Ethernet		2 x RJ45 socket	
RS-422/-485		1 x 4-pos. for full duplex	
Parameterization/operation/diagnostics		1 x 6-pos. MINI DIN socket (PS/2)	
INTERBUS master			
Number of devices with parameter channel		max. 24	
Number of supported devices		max. 128	
Amount of process data		max. 4096 bit (INTERBUS) max. 32768 bit (internal Modbus /TCP client)	
Digital inputs/outputs			
Number of inputs		8	
Number of outputs		4	
Analog inputs/outputs			
Number of inputs		2	-
Number of outputs		2	-
Counter inputs			
Number of inputs		-	2
Input frequency		-	200 kHz
IEC-61131 runtime system			
Programming tool		PC WORX / PC WORX EXPRESS	
Processor		Altera Nios II 64 MHz	
Program memory		1 Mbyte	
Mass storage		1 Mbyte	
Retentive mass storage		48 kbyte (NVRAM)	
Number of data blocks		depends on mass storage	
Number of timers, counters		depends on mass storage	
Number of control tasks		8	
Realtime clock		Yes	
Power supply			
Supply voltage		24 V DC	
Supply voltage range		19.2 V DC ... 30 V DC	
Typical current consumption		310 mA	350 mA
General data			
Dimensions	W / H / D	164 mm / 136.8 mm / 71.5 mm	
Degree of protection		IP20	
Ambient temperature (operation)		-25 °C ... 55 °C	
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Smale-scale controller, complete with accessories (connector and marking field)			
- Analog inputs/outputs	**ILC 191 ME/AN**	2700074	1
- Counter inputs	**ILC 191 ME/INC**	2700075	1

Accessories

Parameterization memory, flash card without license			
- 2 GB	**SD FLASH 2GB**	2988162	1
- 512 MB	**SD FLASH 512MB**	2988146	1
- 2 GB	**SD FLASH 2GB APPLIC A**	2701190	1
- 512 MB	**SD FLASH 512MB APPLIC A**	2701799	1
Programming cable			
	COM CAB MINI DIN	2400127	1
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers			
- ILC 1x1, AXC 1xxxx, ILC 3xx, AXC 3xxx, RFC 4xx, PC WORX RT BASIC/SRT	**AX OPC SERVER**	2985945	1

Class 100 small-scale controllers for remote communication

These modular small-scale controllers offer all the functions of our 1x1 controllers.

In addition, they have an integrated mobile phone modem and more memory. This makes them the ideal solution for remote control and remote maintenance. The corresponding remote control software is: Resy+.

Additional features:

- Integrated GSM/GPRS modem, 16 digital inputs, 4 digital outputs
- Modbus/TCP (client and server) is integrated in the firmware - this increases performance and simplifies configuration
- SD card slot: for quick memory expansion and easy enabling of software blocks
- FTP server
- Flash file system
- Complete fieldbus master (4096 I/O points)
- Numerous protocols supported such as: HTTP, FTP, SNTP, SNMP, SMTP, SQL, MySQL, etc.
- Intuitive programming using PC Worx or using the free PC Worx Express software
- OPC functionality

Notes:

You can find matching I/O modules for these controllers from page 124

With integrated GSM/GPRS modem

Ex:

Technical data

Interfaces		
INTERBUS local bus (master)		Inline data jumper
Ethernet		1 x RJ45 socket
GSM / GPRS		SIM card, SMA antenna connection
INTERBUS master		
Number of devices with parameter channel		max. 16
Number of supported devices		max. 128
Amount of process data		max. 4096 bit (INTERBUS)
Digital inputs/outputs		
Number of inputs		16
Number of outputs		4
IEC-61131 runtime system		
Programming tool		PC WORX / PC WORX EXPRESS
Processor		Altera Nios II 64 MHz
Program memory		512 kbyte
Mass storage		512 kbyte
Retentive mass storage		48 kbyte (NVRAM)
Number of data blocks		depends on mass storage
Number of timers, counters		depends on mass storage
Number of control tasks		8
Realtime clock		Yes
Power supply		
Supply voltage		24 V DC
Supply voltage range		19.2 V DC ... 30 V DC
Typical current consumption		210 mA
General data		
Dimensions	W / H / D	85 mm / 119.8 mm / 71.5 mm
Degree of protection		IP20
Ambient temperature (operation)		-25 °C ... 55 °C
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Small-scale controller, complete with accessories (connector and marking field)	**ILC 151 GSM/GPRS**	2700977	1

Accessories

Multiband antenna for UMTS and quad band GSM, with omnidirectional characteristics	**PSI-GSM/UMTS-QB-ANT**	2313371	1
Parameterization memory, flash card without license			
- 2 GB	**SD FLASH 2GB**	2988162	1
- 512 MB	**SD FLASH 512MB**	2988146	1
- 2 GB	**SD FLASH 2GB APPLIC A**	2701190	1
- 512 MB	**SD FLASH 512MB APPLIC A**	2701799	1
Programming cable	**COM CAB MINI DIN**	2400127	1
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers			
- ILC 1x1, AXC 1xxxx, ILC 3xx, AXC 3xxx, RFC 4xx, PC WORX RT BASIC/SRT	**AX OPC SERVER**	2985945	1

Function blocks — **See page 91**

Class 300 controllers

The class 300 modular controllers provide optimum control for average to demanding automation tasks.

Two Ethernet ports with an integrated switch facilitate flexible connection to a higher-level control room, a local control station or I/O modules. All the information that is needed, for example when starting up the controller following a device replacement, is stored on a memory card.

Your advantages:

– Highly flexible, thanks to expansion with numerous I/O modules
– PROFINET controller and device functionality for consistent PROFINET communication in real time
– Optimum connection, with integrated web server and support for all common IT standards

Additional features:

– Integrated Ethernet interface
– Integrated web server for visualization with WebVisit
– FTP server
– Flash file system
– Numerous protocols supported such as: HTTP, FTP, SNTP, SNMP, SMTP, SQL, MySQL, etc.
– Complete fieldbus master (8192 I/O points)
– Integrated PROFINET controller and integrated PROFINET device
– Intuitive programming with PC Worx (IEC 61131–3)

Notes:

You can find matching I/O modules for these controllers from page 124

With larger memory capacity

Ex:

Technical data

Interfaces		
INTERBUS (master)		Inline data jumper
Higher-level INTERBUS (Slave)		-
Ethernet		1 x RJ45 socket
Parameterization/operation/diagnostics		1 x 6-pos. MINI DIN socket (PS/2)
INTERBUS master		
Number of devices with parameter channel		max. 62
Number of supported devices		max. 512 (in total, of which 254 are remote bus devices/bus segments)
Amount of process data		max. 8192 bit (INTERBUS)
Digital inputs/outputs		
Number of inputs		12
Description of the input		Eight fast inputs, interrupt input
Number of outputs		4
IEC-61131 runtime system		
Processor		PXA 255 400 MHz
Program memory		typ. 1 Mbyte
Mass storage		2 Mbyte
Retentive mass storage		64 kbyte (NVRAM)
Number of data blocks		depends on mass storage
Number of timers, counters		depends on mass storage
Number of control tasks		16
Realtime clock		Integrated (battery backup)
Power supply		
Supply voltage		24 V DC ±5 %
Supply voltage range		20.4 V DC ... 30 V DC
Typical current consumption		250 mA (no local bus device connected during idling, bus inactive)
General data		
Dimensions	W / H / D	182 mm / 140.5 mm / 71.5 mm
Degree of protection		IP20
Ambient temperature (operation)		-25 °C ... 55 °C
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline controller, complete with accessories (connector and marking field), with GL approval			
- PROFINET controller	**ILC 350 PN**	2876928	1

Accessories

Parameterization memory			
- 256 MB	**CF FLASH 256MB**	2988780	1
- 2 GB	**CF FLASH 2GB**	2701185	1
Programming cable			
	COM CAB MINI DIN	2400127	1
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers			
- ILC 1x1, AXC 1xxxx, ILC 3xx, AXC 3xxx, RFC 4xx, PC WORX RT BASIC/SRT	**AX OPC SERVER**	2985945	1

**For maritime applications,
with INTERBUS slave interface**

**Powerful,
with INTERBUS slave interface**

Technical data	
Inline data jumper	Inline data jumper
D-SUB-9 socket/D-SUB-9 connector	D-SUB-9 socket/D-SUB-9 connector
2 x RJ45 socket	2 x RJ45 socket
1 x 6-pos. MINI DIN socket (PS/2)	1 x 6-pos. MINI DIN socket (PS/2)
max. 62	max. 62
max. 512 (in total, of which 254 are remote bus devices/bus segments)	max. 512 (in total, of which 254 are remote bus devices/bus segments)
max. 8192 bit (INTERBUS master)	max. 8192 bit (INTERBUS master)
max. 512 bit (INTERBUS slave)	max. 512 bit (INTERBUS slave)
12	12
Eight fast inputs, interrupt input	Eight fast inputs, interrupt input
4	4
PXA 255 400 MHz	PXA 270 624 MHz
typ. 2 Mbyte	typ. 2 Mbyte
4 Mbyte	4 Mbyte
96 kbyte (NVRAM)	96 kbyte (NVRAM)
depends on mass storage	depends on mass storage
depends on mass storage	depends on mass storage
16	16
Integrated (battery backup)	Integrated (battery backup)
24 V DC ±5 %	24 V DC ±5 %
20.4 V DC ... 30 V DC	20.4 V DC ... 30 V DC
250 mA (no local bus device connected during idling, bus inactive)	250 mA (no local bus device connected during idling, bus inactive)
182 mm / 140.5 mm / 71.5 mm	182 mm / 140.5 mm / 71.5 mm
IP20	IP20
-25 °C ... 55 °C	-25 °C ... 55 °C
Class A product, see page 525	Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
ILC 370 PN 2TX-IB/M	2985576	1

Accessories

CF FLASH 256MB	2988780	1
CF FLASH 2GB	2701185	1
COM CAB MINI DIN	2400127	1
AX OPC SERVER	2985945	1

Ordering data

Type	Order No.	Pcs./Pkt.
ILC 390 PN 2TX-IB	2985314	1

Accessories

CF FLASH 256MB	2988780	1
CF FLASH 2GB	2701185	1
COM CAB MINI DIN	2400127	1
AX OPC SERVER	2985945	1

Class 400 high-performance controllers

More memory, more speed, more power. The PROFINET-compatible class 400 controllers are the most powerful PLCs from Phoenix Contact. Control demanding automation tasks with maximum performance and intelligent features.

Your advantages:
– Highly flexible, thanks to expansion with numerous I/O modules
– Communication in realtime via PROFINET
– Optimum connection, with integrated web server and support for all common IT standards
– Maximum performance, thanks to high processor speed

Additional features:
– Control and fieldbus system status messages are easily read via the diagnostic display
– Thanks to the powerful processor, comprehensive automation tasks can be processed at maximum speed
– Integrated Ethernet interface
– Integrated web server for visualization with WebVisit
– FTP server
– Flash file system
– Numerous protocols supported such as: HTTP, FTP, SNTP, SNMP, SMTP, SQL, MySQL, etc.
– Integrated INTERBUS master
– Integrated PROFINET controller and PROFINET device
– Intuitive programming with PC Worx (IEC 61131–3)

The **safety version** offers all the properties of the RFC 470 PN controller and also has an integrated safety controller. This combination can be used to integrate safety functions up to SIL 3 into existing systems.

The use of PROFIsafe reduces wiring effort and installation time.

Uninterrupted processes are vital in complex systems and large plants. Ensure the continuous operation of your automation - with the **PROFINET redundancy controllers** from Phoenix Contact.

The high-performance PLCs establish a redundant system automatically thanks to AutoSync technology.

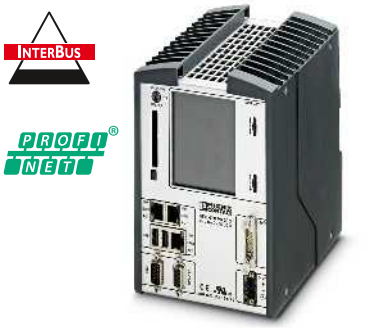
Your advantages:
– Fast startup and automatic configuration of all redundancy functions, thanks to AutoSync technology
– Uninterrupted process in the event of failure or when a controller is replaced
– Optimum device integration, thanks to PROFINET standards; redundancy for your future-proof Ethernet network
– A distance of up to 80 km between the controllers via fiber optics; cost-optimized thanks to plug-in SFP modules
– High-resolution display for displaying status and error messages in plain text
– Uninterrupted visualization - thanks to redundancy-capable OPC server

Notes:

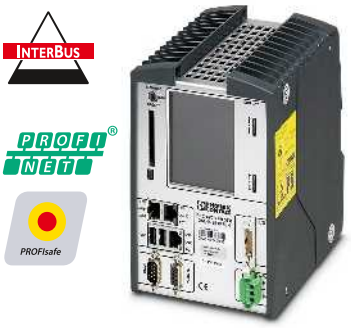
Further information on safety versions can be found in the “Functional Safety” section on page 87

Interfaces	
INTERBUS (Master)	
Ethernet	
Parameterization/operation/diagnostics	
Synchronization interface	
USB 2.0	
INTERBUS master	
Number of devices with parameter channel	
Number of supported devices	
Amount of process data	
Digital inputs/outputs	
Connection method	
Number of inputs	
Number of outputs	
IEC-61131 runtime system	
Processor	
Program memory	
Mass storage	
Retentive mass storage	
Number of data blocks	
Number of timers, counters	
Number of control tasks	
Realtime clock	
Power supply	
Supply voltage	
Supply voltage range	
Typical current consumption	
General data	
Dimensions	W / H / D
Degree of protection	
Ambient temperature (operation)	
EMC note	

Description
Remote Field Controller - 3 x 10/100 Ethernet, PROFINET IO controller
Parameterization memory - 256 MB - 2 GB
Programming cable, to connect the controller boards to the PC (RS-232-C), length 3 m
USB memory stick, memory capacity 8 GB
RS-232 null modem adapter - 9-pos. socket to 9-pos. connector
Fan module for Remote Field Controller
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers - ILC 1x1, AXC 1xxxx, ILC 3xx, AXC 3xxx, RFC 4xx, PC WORX RT BASIC/SRT



Remote Field Controller



With integrated safety controller

With redundancy function

Technical data		
1 x D-SUB-9 socket	1 x D-SUB-9 socket	-
3 x RJ45 socket	3 x RJ45 socket	3 x RJ45 socket
1 x D-SUB 9 connector	1 x D-SUB 9 connector	-
-	-	1 x SFP port
-	-	2 x USB type A, socket
max. 126	max. 126	-
max. 512 (of which 254 are remote bus devices/bus segments)	max. 512 (of which 254 are remote bus devices/bus segments)	-
max. 8192 bit (INTERBUS master)	max. 8192 bit (INTERBUS)	-
14-pos. FLK pin strip	14-pos. FLK pin strip	-
5	5	-
3	3	-
Intel® Celeron® 927 UE 1.5 GHz	Intel® Celeron® 927 UE 1.5 GHz	Intel® Celeron® M ULV 423 800 MHz
typ. 8 Mbyte	typ. 8 Mbyte	typ. 8 Mbyte
16 Mbyte	16 Mbyte	16 Mbyte
240 kbyte (NVRAM)	240 kbyte (NVRAM)	120 kbyte (NVRAM)
depends on mass storage	depends on mass storage	depends on mass storage
depends on mass storage	depends on mass storage	depends on mass storage
16	16	1
Integrated (battery backup)	Integrated (battery backup)	Integrated (battery backup)
24 V DC	24 V DC	24 V DC
19.2 V DC ... 30 V DC (including ripple)	19.2 V DC ... 30 V DC (including ripple)	19.2 V DC ... 30 V DC (including ripple)
1 A	1 A	1 A
124 mm / 185 mm / 190 mm	124 mm / 185 mm / 190 mm	124 mm / 185 mm / 190 mm
IP20	IP20	IP20
0 °C ... 55 °C (from 45°C only with fan module)	0 °C ... 55 °C (from 45°C only with fan module)	0 °C ... 55 °C (from 45°C only with fan module)
Class A product, see page 525	Class A product, see page 525	Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
RFC 470 PN 3TX	2916600	1

Accessories

CF FLASH 256MB	2988780	1
CF FLASH 2GB	2701185	1
IBS PRG CAB	2806862	1
USB FLASH DRIVE	2402809	1
PSM-AD-D9-NULLMODEM	2708753	1
RFC DUAL-FAN	2730239	1
AX OPC SERVER	2985945	1

Ordering data

Type	Order No.	Pcs./Pkt.
RFC 470S PN 3TX	2916794	1

Accessories

CF FLASH 256MB	2988780	1
CF FLASH 2GB	2701185	1
IBS PRG CAB	2806862	1
USB FLASH DRIVE	2402809	1
PSM-AD-D9-NULLMODEM	2708753	1
RFC DUAL-FAN	2730239	1
AX OPC SERVER	2985945	1

Ordering data

Type	Order No.	Pcs./Pkt.
RFC 460R PN 3TX	2700784	1

Accessories

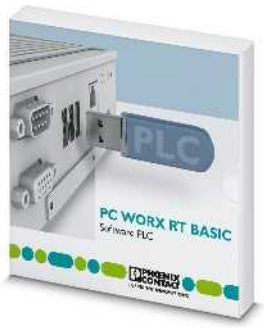
CF FLASH 256MB	2988780	1
CF FLASH 2GB	2701185	1
USB FLASH DRIVE	2402809	1
RFC DUAL-FAN	2730239	1
AX OPC SERVER	2985945	1

Software PLC for installation on IPCs

Industrial PCs for visualizing and operating processes are often only utilized to a limited extent. Make use of these available resources and also transform your industrial PC into a full-fledged PLC.

Your advantages:

– For complex automation with real time requirements
– Stable and reliable thanks to operating system extension
– Easy and inexpensive visualization, thanks to integrated web server
– Maximum Ethernet openness, as all common protocols are supported
– Programming, visualization, and control can be performed on the same hardware
– Easy communication via PROFINET or Modbus using the PC's Ethernet interface



Software PLC
With realtime extension

Technical data

Hardware requirements	
Processor	min. Intel® Core™2 Duo
Main memory (RAM)	min. 2 Gbyte
Hard disk memory	min. 1 Gbyte
Interfaces	Ethernet port, USB port
Operating equipment	Keyboard, mouse recommended
Monitor resolution	XGA (1024 x 768)
Software requirements	
Operating systems	Windows® 7 (32-bit/64-bit) Windows® Embedded Standard 7 Windows® Embedded 2009 Windows® 10 (32-bit/64-bit) Windows® 8.1 (32-bit/64-bit)
Supported browsers	Internet Explorer Version 8 or later
Basic functions	
	Complete PLC PROFINET controller and device functionality only in conjunction with a Valueline PC INTERBUS functionality only in conjunction with an INTERBUS master controller board Integration of Modbus/TCP in the firmware
IEC-61131 runtime system	
Programmable under	PC Worx in IEC 61131
Processing speed	0.001 ms (1 K mixed instructions, Intel® Core™2 Duo 1.5 GHz) 0.7 µs (1 K bit instructions, Intel® Core™2 Duo 1.5 GHz)
Program memory	8 Mbyte
Mass storage	16 Mbyte
Retentive mass storage	240 kbyte
Number of data blocks	depends on mass storage
Number of timers, counters	depends on mass storage
Number of control tasks	16

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Software PLC	**PC WORX RT BASIC**	2700291	1

Accessories

PC controller board	**IBS PCI SC/I-T**	2725260	1
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers	**AX OPC SERVER**	2985945	1

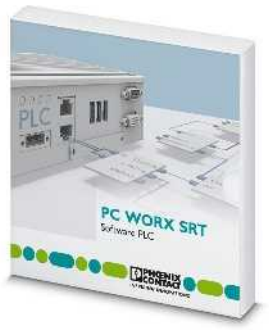
Industrial PC — **See page 24 onwards**

Software PLC for installation on IPCs

Industrial PCs for visualizing and operating processes are often only utilized to a limited extent. Make use of these available resources and also transform your industrial PC into a full-fledged PLC.

Your advantages:

- For small to medium tasks with statistically guaranteed response times
- Easy and inexpensive visualization, thanks to integrated web server
- Maximum Ethernet openness, as all common protocols are supported
- Installation on virtually all Windows PCs
- Programming, visualization, and control can be performed on the same hardware
- Easy communication via PROFINET or Modbus using the PC's Ethernet interface



Software PLC
Without realtime extension

Technical data

Hardware requirements	
Processor	min. Intel® Atom™
Main memory (RAM)	min. 512 Mbyte
Hard disk memory	min. 1 Gbyte
Interfaces	Ethernet Port
Operating equipment	Keyboard, mouse recommended
Monitor resolution	XGA (1024 x 768)
Software requirements	
Operating systems	Windows® 7 (32-bit/64-bit) Windows® Embedded Standard 7 Windows® Embedded 2009 Windows® 10 (32-bit/64-bit) Windows® 8.1 (32-bit/64-bit)
Supported browsers	Internet Explorer Version 8 or later
Basic functions	
	Complete PLC Non-realtime-capable software PLC for installation on a standard PC with integrated Modbus TCP, plus PROFINET controller and device functionality
IEC-61131 runtime system	
Programmable under	PC Worx in IEC 61131
Processing speed	5.5 µs (1 K mixed instructions, Intel® Atom™ Z510PT) 4 µs (1 K bit instructions, Intel® Atom™ Z510PT)
Program memory	1 Mbyte
Mass storage	1 Mbyte
Retentive mass storage	48 kbyte
Number of data blocks	depends on mass storage
Number of timers, counters	depends on mass storage
Number of control tasks	8

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Software PLC	**PC WORX SRT**	2701680	1

Accessories

AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers	**AX OPC SERVER**	2985945	1

Industrial PC — **See page 24 onwards**

Starter kit for automation with small-scale controllers – PROFINET

The new PROFINET starter kit provides a cost-effective introduction to discovering the advantages of PROFINET technology. Here, the latest, robust components are integrated with an automation station consisting of an Axiocontrol PLC and Axioline F I/O system. You can therefore build your own test and learning application.

Your advantages:

– Fast introduction to automation with PROFINET, thanks to step-by-step instructions for the test structure
– Structure with the latest automation station based on Axiocontrol and Axioline components
– Get started straight away with a set of all the necessary products

Test setup for the quick start guide on PROFINET automation

Technical data

See AXC 1050 on page 76

Ordering data

Description	Type	Order No.	Pcs./Pkt.
PROFINET starter kit, incl. AXC 1050 controller, bus coupler, I/O modules, power supply, and cables as well as PC Worx software with quick start guide and application example	**AXC 1050 PN STARTERKIT**	2400361	1

Starter kit for automation with small-scale controllers – INTERBUS

The ILC 131 starter kit provides an easy introduction to our controllers. Learn about control technology with the aid of a pre-assembled test structure with programmed examples. Then use the PC Worx Express programming software to create custom solutions.

Begin by starting up the controller, configure it, and parameterize the bus structure. With the test structure, enter the world of IEC 61131–3-compliant programming.

Controller performance data at a glance:

– Supply voltage: 24 V DC
– Integrated inputs /outputs: 8 / 4
– Processing time per 1000 instructions: 90 µs (bit data types), 1.7 ms (mixed data types)
– Program / mass storage: 192 kB / 192 kB
– Remanent mass storage: 8 kB

Test setup for the quick start guide on INTERBUS automation

Technical data

See ILC 131 ETH on page 80

Ordering data

Description	Type	Order No.	Pcs./Pkt.
ILC 131 starter kit, incl. ILC 131 ETH, analog input module, control panel, power supply, plus accessories and cables with test application set up	**ILC 131 STARTERKIT**	2701835	1

Accessories

Programming cable			
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers			
- ILC 1x1, AXC 1xxxx, ILC 3xx, AXC 3xxx, RFC 4xx, PC WORX RT BASIC/SRT	**AX OPC SERVER**	2985945	1
	COM CAB MINI DIN	2400127	1

Function blocks/libraries

new

Modular controllers from Phoenix Contact can be adapted to any requirement quickly and easily using SD cards and function blocks. This means that parameterization memories, licenses for function block libraries or completely tested applications can be installed at a later time, without the need for additional hardware.

Industry-specific function blocks are tailored to the individual requirements of a particular industry and offer considerable advantages when it comes to engineering.

Extend your system quickly and easily with the following functions:
– IEC-61850 communication
– Integration of SafetyBridge I/O modules
– Energy measurement
– Multiplexer function
– webMI functionality of atvise®
– Control technology
– Network protocols
– IT security
– Network management
– Databases
– CAN bus
– Motor management
– Remote control protocols (Resy+)

Your advantages:
– Individual expansion of the controller solution with complete and tested applications
– Activation of libraries and function blocks via license keys
– Uncomplicated device replacement by transferring the data via SD card

If the card is marked with the **APPLIC A** suffix, it contains a corresponding license for activating further function block libraries.

These function block libraries can be downloaded from our website.

Your web code: #1390

SD memory card with function block license

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Program and configuration memory, Flash card with license key for IEC-61850 communication			
- 2 GB	**SD FLASH 2GB 61850**	2400435	1
- 2 GB, with license key for activating further function block libraries	**SD FLASH 2GB APPLIC A 61850**	2400436	1
Program and configuration memory, Flash card with license key and user program for easy web-based configuration and startup of a SafetyBridge solution			
- 2 GB, for Inline	**SD FLASH 2GB EASY SAFE BASIC**	2403297	1
- 2 GB, for Inline including communication via Modbus/TCP, PROFINET, and e-mail	**SD FLASH 2GB EASY SAFE PRO**	2403298	1
- 2 GB, for Axioline including communication via Modbus/TCP, PROFINET, and e-mail	**SD FLASH 2GB AXC EASY SAFE PRO**	2403730	1
Program and configuration memory, plug-in, 2 GB with license key and user program for reading from measuring devices	**SD FLASH 2GB EMLOG**	2403484	1
Program and configuration memory, Flash card with license key for multiplexer applications. For configuring two ILC 131 ETH devices as multiplexers			
- 512 MB	**SD FLASH 512MB MODULAR MUX**	2701872	1
Program and configuration memory, Flash card for using the webMI functionality of atvise®			
- 2 GB	**SD FLASH 2GB ATVISE**	2400088	1
- 2 GB, with license key for activating further function block libraries	**SD FLASH 2GB APPLIC A ATVISE**	2400089	1
Program and configuration memory, Flash card with license key for controller function blocks with self-optimization for temperature control			
- 512 MB	**SD FLASH 512MB PDPI BASIC**	2701800	1
- 256 MB	**CF FLASH 256MB PDPI BASIC**	2700549	1
- 512 MB, extended with functions for process automation	**SD FLASH 512MB PDPI PRO**	2701801	1
- 256 MB, extended with functions for process automation	**CF FLASH 256MB PDPI PRO**	2700550	1
Program and configuration memory, Flash card with license key for function block libraries such as SNMP, SQL, wireless, motion functionalities, etc.			
- 2 GB	**SD FLASH 2GB APPLIC A**	2701190	1
- 2 GB	**CF FLASH 2GB APPLIC A**	2701189	1
- 512 MB	**SD FLASH 512MB APPLIC A**	2701799	1
- 256 MB	**CF FLASH 256MB APPLIC A**	2988793	1
Resy+ function block library for remote control connections such as IEC 60870-5-101/104, Modbus TCP/RTU, ODP, DNP3, etc.	**RESY-DATA-A LIC**	2876847	1

Whatever your automation task: our specialists in the AUTOMATIONWORX Competence Center are available to answer any questions you may have. This is made possible by our flexible service concept.

Based on the typical phases of a project, we work with you at each stage. With our expertise and years of experience we provide support that is tailored to your industry and the specific phase of your project.

Your advantages:

– Save time by transferring automation tasks to Phoenix Contact
– Optimum automation solution thanks to comprehensive technology and product expertise
– Sophisticated process management thanks to the consistent consideration of all requirements
– Target-oriented project management with optimally coordinated process steps
– Traceable, legal protection thanks to consistent documentation

Services for Functional Safety can be found on page 312.

Services for Industrial Ethernet can be found on page 442.

Service

You can rely on our support for the smooth operation of your application. Our experts deal with queries encountered in practical applications every day. They draw on their experience of all sectors and knowledge of the components and technologies used.

Our service specialists will be happy to support you with the following services:
– Hotline
– On-site service
– Startup support
– Professional workshops

If queries arise during startup and operation, in addition to your local specialists you can also contact our free 24-hour hotline at any time:
+49 5281 9-462888
Or send us an e-mail:
automation-service@phoenixcontact.com

We will be happy to answer general questions regarding the functionality of individual components or the system. If this is not sufficient, our startup support team and on-site service will be there to provide assistance.

Training

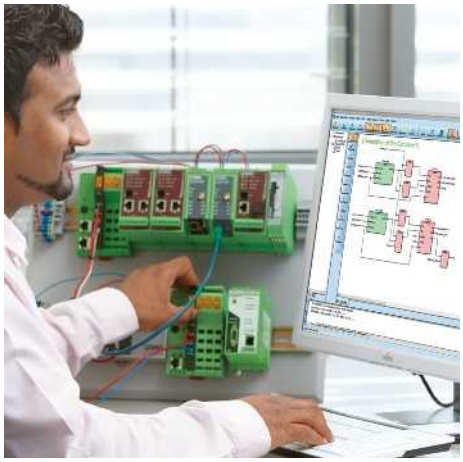
Discover the added value our individual training concepts and training services offer.

With our tailor-made concepts, we help you and your employees to make optimum use of the control and I/O systems from Phoenix Contact.

With our free consultation service, you can arrange with us the contents, duration, location, and date of your individual training session.

Should you have any queries regarding our training services and qualification concepts, please contact your local contact person or contact our Back Office Training team directly:
+ 49 5281 9-462161
Or send us an e-mail:
automation-training@phoenixcontact.com

We will happily advise you on the implementation of your qualification requirements and work with you to create your own individual training program.



Engineering

Whatever your automation task: our engineering specialists are available to answer any questions you may have. Based on the typical phases of a project, we work with you at each stage.

With our expertise and years of experience we provide support that is tailored to your industry and the specific phase of your project.

Simply give us an outline of the applications you would like to implement and we will provide you with a technical concept that includes suitable hardware and software.
– Configuration
– Programming
– Visualization
– Coaching

a 0 1 2 3 4 5 6 7
PHOENIX CONTACT
S1
S2

DIO16
ETH 1
ETH 2
X21
X22
PWR IN
PWR OUT
X31
X32
PHOENIX CONTACT
X01
X02
X03
X04
X05
X06
X07
X08

I/O systems

I/O systems from Phoenix Contact are the perfect solution for control cabinet engineering or field installation.

I/O systems for the control cabinet

Axioline F

Axioline F is fast, robust, and easy.

Open to all Ethernet-based communication protocols and PROFIBUS, Axioline F enables the shortest response times, fast installation, and is characterized by its particularly robust design and easy handling.

Inline

Inline, our I/O automation kit, can be used to connect sensors and actuators with a maximum range of functions.

These I/Os can also be found in safety applications or potentially explosive areas.

I/O systems for field installation

Axioline E

The I/O system features a fast response time, robust design, and easy handling.

The comprehensive portfolio with optional plastic or zinc die-cast housing enables use in a wide range of environments.

Fieldline

The devices in the Fieldline product range with IP65/IP67 protection are optimized for use in machine building and systems manufacturing directly in the field.

AS-Interface

The digital I/O devices in the Fieldline Extension AS-Interface product range offer significant installation advantages thanks to their innovative connection technology.

Product overview 96

For the control cabinet (IP20)

Axioline F
Product overview 98
I/O modules 100

Inline
Product overview 124
I/O terminals 127

Inline Block IO
Product overview 188

INTERBUS Smart Terminals
Product overview 189

For field installation (IP67)

Axioline E
Product overview 190
I/O devices 192

Fieldline Modular
Product overview 208
I/O devices 210

AS-Interface
Product overview 224
I/O devices 226

Fieldline Stand-Alone
Product overview 236

Ruggedline
Product overview 237

I/O systems for the control cabinet (IP20)

Axioline F

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Inline

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Inline Block IO

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INTERBUS ST

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I/O systems for field installation (IP67)

Axioline E – devices in plastic and metal version

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Fieldline Modular

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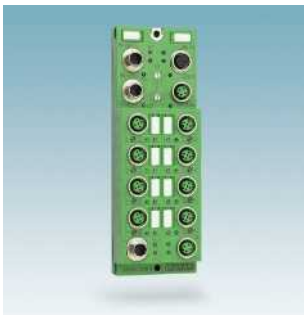

Fieldline Stand-Alone

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AS-Interface

Page 224

Controllers

Modular controllers

Page 71

Functional Safety

Safe I/Os

Page 296

Wireless data communication

Wireless I/O

Page 466

Sensor/actuator cabling

• See Catalog 2 –
Corresponding cabling for I/O systems

Your web code: #0564

Marking and labeling

• See Catalog 3 – marking and labeling section

Your web code: #0575

Ruggedline

Page 237

Product overview

Bus couplers

PROFINET	EtherCAT	EtherNet/IP	sercos the automation bus	Modbus/TCP (UDP)	Ethernet IEC 61850	PROFIBUS
101	100	103	101	103	103	104

Modular controllers

Small-scale controller	High-performance controller
76	77

Power module

Power module
105

Input and output modules

Digital input	Digital output	Digital input and output
8 - 64 channels	4 - 64 channels	8 - 16 channels
106	108	112

Analog input	Analog output	Analog input and output
4 - 8 channels	4 - 8 channels	2 channels
114	117	116

Temperature recording
RTD / UTH
118

Function modules

Serial communication	Counters	Position detection
RS-485/422/232	2 channels	
120	121	122

Safe I/Os

SafetyBridge Technology	PROFIsafe
300	302

General accessories

ZB 20,3 AXL UNPRINTED

Zack marker strip, for device marking, unprinted

ZBF 10/5,8 AXL UNPRINTED

Zack marker strip, flat, for connector and slot marking, unprinted

EMT (35x...)R

Marking label rolls, unprinted

AXL SHIELD SET

Overall shield connection set

AXL BS BK

Bus base module for bus couplers

AXL F BS H

Bus base module for housing type H

AXL F BS F

Bus base module for housing type F

phoenixcontact.net/products

General technical data

Ambient conditions	
Temperature range (operation) - extended (...-XC modules) Relative humidity (operation/storage/transport) Vibration Shock Continuous shock Degree of protection	-25°C ... +60°C -40°C ... +70°C 5% to 95% (non-condensing) 5g according to EN 60068-2-6/IEC 60068-2-6 30g according to EN 60068-2-27/IEC 60068-2-27 10g according to EN 60068-2-27/IEC 60068-2-29 IP20

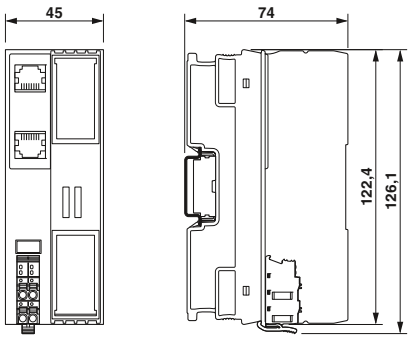
Electromagnetic compatibility	
Noise emission Noise immunity	Class B according to EN 55022 According to EN 61000-4

System times	
System bus cycle time Offset per module	2 µs 1 µs

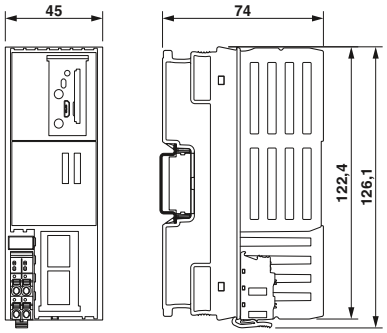
Housing types and dimensions

Bus coupler

RJ45 connection

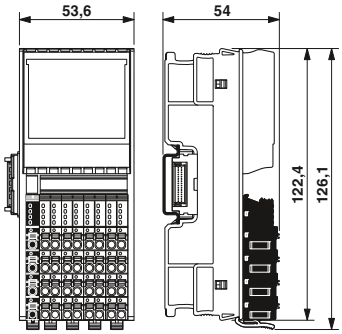


SC-RJ connection

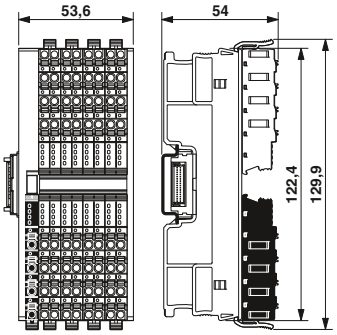


I/O modules

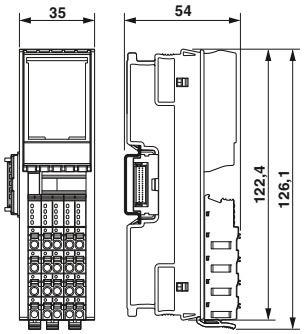
Housing type 1F



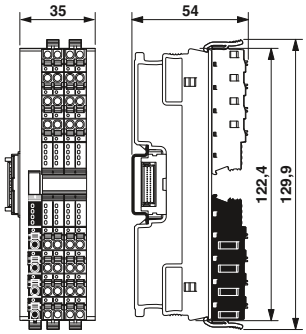
Housing type 2F



Housing type 1H



Housing type 2H



Bus couplers

The Axioline F bus couplers are the link between the Axioline F system and the higher-level network.

For startup tests, the Axioline F station can be started up independently of the higher-level network via either an Ethernet port or the local service interface on the bus coupler using the Startup+ software.

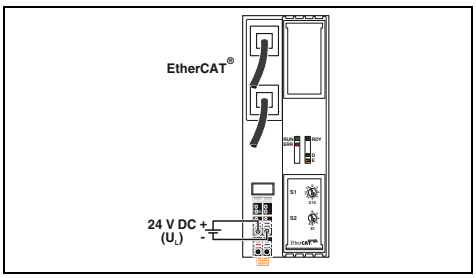
EtherCAT® features:
– Minimum cycle time of EtherCAT® is 50 µs
– Supported mailbox protocols CoE, FoE
– Automatic and manual addressing

Sercos® features:
– Sercos specification V1.3
– Minimum Sercos cycle time of 31.25 µs

PROFINET features:
– PROFINET RT and PROFINET IRT support
– MRP implemented
– Web-based management

RJ45 connection

EtherCAT



Technical data

Interface		
Fieldbus system		EtherCAT®
Connection method		RJ45 socket
Number		2
Transmission speed		100 Mbps (Full duplex)
Transmission length		max. 100 m
Transmission length including 3 dB system reserve		-
Protocols supported		CoE, FoE
Service interface		
Connection method		Micro USB type B
Local bus interface		
Designation		Axioline F local bus
Connection method		Bus base module
Transmission speed		100 Mbps
Number of supported devices		max. 63 (per station)
Power supply for module electronics		
Supply of communications power U_L		24 V DC
Maximum permissible voltage range		19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Communications power U_{Bus}		5 V DC (via bus base module)
Current supply at U_{Bus}		2 A
Protective circuit		Surge protection of the supply voltage Polarity reversal protection of the supply voltage
General data		
Connection method		Push-in connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight		177 g
Dimensions	W / H / D	45 mm / 125.9 mm / 74 mm
EMC note		

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline F bus coupler - For EtherCAT® - For Sercos - For PROFINET (specification 2.3) - For PROFINET (specification 2.2)	**AXL F BK EC**	2688899	1

Accessories

Axioline F bus base module (replacement part)	**AXL BS BK**	2701422	5

sercos the automation bus

RJ45 connection

PROFINET

new

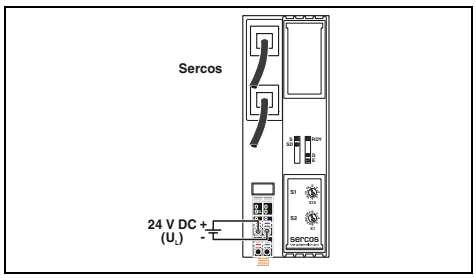
RJ45 connection

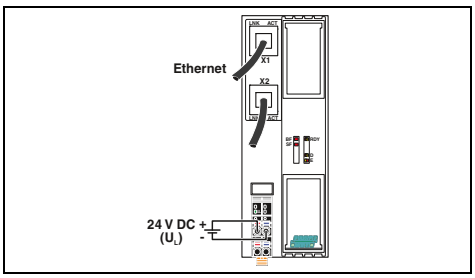
PROFINET

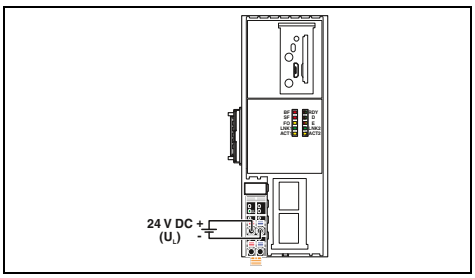
new

SC-RJ connection

DNV GL ClassNK







Technical data

Sercos	
RJ45 socket	
2	
100 Mbps (Full duplex)	
max. 100 m	
-	
Sercos, TFTP	
Micro USB type B	
Axioline F local bus	
Bus base module	
100 Mbps	
max. 63 (per station)	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
5 V DC (via bus base module)	
2 A	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
Push-in connection	
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
177 g	
45 mm / 125.9 mm / 74 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F BK S3	2701686	1

Accessories

AXL BS BK	2701422	5

Technical data

	AXL F BK PN TPS	AXL F BK PN
	PROFINET	
	RJ45 socket, auto negotiation and auto crossing	
	2	
	100 Mbps (Full duplex)	
	max. 100 m	
	PROFINET, TFTP, PTCP, LLDP, SNMP, MRP, DDI, BootP	
	Micro USB type B	
	Axioline F local bus	
	Bus base module	
	100 Mbps	
	max. 63 (per station)	
	24 V DC	
	19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
	5 V DC (via bus base module)	
	2 A	
	Surge protection of the supply voltage	
	Polarity reversal protection of the supply voltage	
	Push-in connection	
	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
	177 g	
	45 mm / 126.1 mm / 74 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F BK PN TPS	2403869	1
AXL F BK PN	2701815	1

Accessories

AXL BS BK	2701422	5

Technical data

PROFINET	
SC-RJ socket	
2	
100 Mbps (acc. to PROFINET standard)	
-	
max. 50 m (Polymer fiber with F-K 980/1000 230 dB/km at 100 Mbps)	
max. 100 m (PCF fiber with F-S 200/230 8 dB/km at 100 Mbps)	
PROFINET, TFTP, PTCP, LLDP, SNMP, MRP, DDI, BootP	
Micro USB type B	
Axioline F local bus	
Bus base module	
100 Mbps	
max. 63 (per station)	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
5 V DC (via bus base module)	
2 A	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
Push-in connection	
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
172 g	
45 mm / 126.1 mm / 74 mm	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F BK PN SC-RJ	2400165	1

Accessories

AXL BS BK	2701422	5

Bus couplers

new

The Axioline F bus couplers are the link between the Axioline F system and the higher-level network.

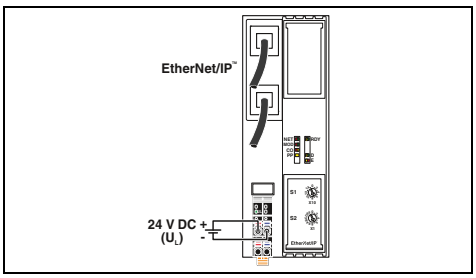
For startup tests, the Axioline F station can be started up independently of the higher-level network via either an Ethernet port or the local service interface on the bus coupler using the Startup+ software.

EtherNet/IP™ features:
– ACD (Address Conflict Detection) implemented
– RPI (Request Packet Interval) of 5 µs
– Device Level Ring (DLR) (for AXL F BK EIP EF)

Modbus/TCP (UDP) features:
– Two rotary coding switches for address assignment
– One or two MAC addresses
– Software interfaces for access via TCP/IP:
  - Device Driver Interface (DDI)
  - High-Level Language Fieldbus Interface (HFI)

SAS features (IEC 61850):
– Communication according to IEC 61850-5, MMS, and GOOSE
– Time synchronization via SNTP
– Web server

RJ45 connection



Technical data

		AXL F BK EIP	AXL F BK EIP EF
Interface			
Fieldbus system		EtherNet/IP™	
Connection method		RJ45 socket	
Number		2	
Transmission speed		10/100 Mbps (Half or full duplex mode (automatic detection, can be adjusted manually))	
Transmission length		max. 100 m	
Protocols supported		EtherNet/IP™, SNMP, HTTP, BootP, DHCP, FTP, TFTP	EtherNet/IP™, SNMP, DLR, HTTP, BootP, DHCP, FTP, TFTP
Service interface			
Connection method		Micro USB type B	
Local bus interface			
Designation		Axioline F local bus	
Connection method		Bus base module	
Transmission speed		100 Mbps	
Number of supported devices		max. 63 (per station)	
Power supply for module electronics			
Supply of communications power U_L		24 V DC	
Maximum permissible voltage range		19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
Communications power U_{Bus}		5 V DC (via bus base module)	
Current supply at U_{Bus}		2 A	
Protective circuit		Surge protection of the supply voltage Polarity reversal protection of the supply voltage	
General data			
Connection method		Push-in connection	
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
Weight		177 g	
Dimensions	W / H / D	45 mm / 125.9 mm / 74 mm	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline F bus coupler - For EtherNet/IP™ - For EtherNet/IP™, extended functions - For Ethernet (Modbus/TCP) - For Ethernet (IEC 61850) - For extended temperature range of -40°C ... +70°C	**AXL F BK EIP** **AXL F BK EIP EF**	2688394 2702782	1 1

Accessories

Axioline F bus base module (replacement part)	**AXL BS BK**	2701422	5

Modbus/TCP (UDP)

RJ45 connection

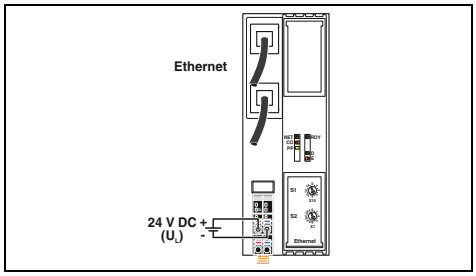
Modbus/TCP (UDP)

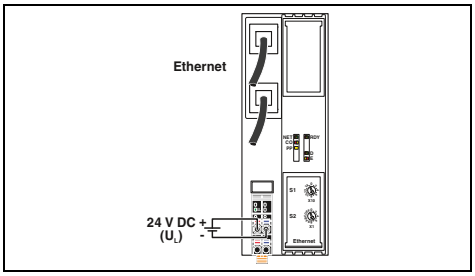
RJ45 connection,
two separate Ethernet ports

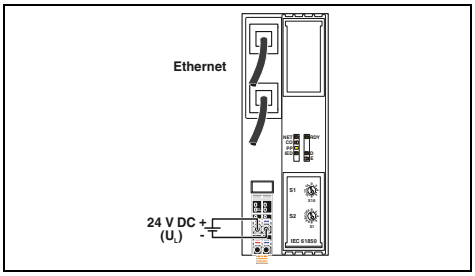
Ethernet

IEC 61850

RJ45 connection







Technical data

Modbus/TCP (UDP)	
RJ45 socket	
2	
10/100 Mbps (Half or full duplex mode (automatic detection, can be adjusted manually))	
max. 100 m	
Modbus/TCP (UDP), SNMP, HTTP, BootP, DHCP, FTP, TFTP	
Micro USB type B	
Axioline F local bus	
Bus base module	
100 Mbps	
max. 63 (per station)	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
5 V DC (via bus base module)	
2 A	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
Push-in connection	
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
177 g	
45 mm / 125.9 mm / 74 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F BK ETH	2688459	1
AXL F BK ETH XC	2701949	1

Accessories

AXL BS BK	2701422	5

Technical data

Ethernet (2 networks)	
RJ45 socket	
2	
10/100 Mbps (Half or full duplex mode (automatic detection, can be adjusted manually))	
max. 100 m	
Modbus/TCP (UDP), SNMP, HTTP, BootP, DHCP, FTP, TFTP	
Micro USB type B	
Axioline F local bus	
Bus base module	
100 Mbps	
max. 63 (per station)	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
5 V DC (via bus base module)	
2 A	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
Push-in connection	
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
177 g	
45 mm / 125.9 mm / 74 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F BK ETH NET2	2702177	1

Accessories

AXL BS BK	2701422	5

Technical data

Ethernet (IEC 61850, MMS, GOOSE)	
RJ45 socket	
2	
100 Mbps (Full duplex)	
max. 100 m	
MMS, GOOSE, SNMP, HTTP, BootP, DHCP, FTP, TFTP, SNTP	
Micro USB type B	
Axioline F local bus	
Bus base module	
100 Mbps	
max. 63 (per station)	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
5 V DC (via bus base module)	
2 A	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
Push-in connection	
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
177 g	
45 mm / 125.9 mm / 74 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F BK SAS	2701457	1

Accessories

AXL BS BK	2701422	5

Bus couplers

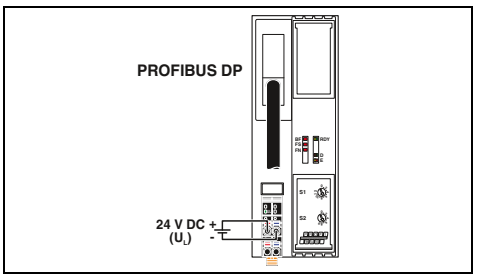
The Axioline F bus couplers are the link between the Axioline F system and the higher-level network.

For startup tests, the Axioline F station can be started up independently of the higher-level network via either an Ethernet port or the local service interface on the bus coupler using the Startup+ software.

Features:

– I&M functions
– Operation of PROFIsafe devices

D-SUB connection



Technical data

Interface		
Fieldbus system		PROFIBUS DP
Connection method		D-SUB-9 socket
Number		1
Transmission speed		9.6 kbps ... 12 Mbps
Service interface		
Connection method		Micro USB type B
Local bus interface		
Designation		Axioline F local bus
Connection method		Bus base module
Transmission speed		100 Mbps
Number of supported devices		max. 63 (per station)
Power supply for module electronics		
Supply of communications power U_L		24 V DC
Maximum permissible voltage range		19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Communications power U_{Bus}		5 V DC (via bus base module)
Current supply at U_{Bus}		2 A
Protective circuit		Surge protection of the supply voltage Polarity reversal protection of the supply voltage
General data		
Connection method		Push-in connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight		175 g
Dimensions	W / H / D	45 mm / 125.9 mm / 74 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline F bus coupler - For PROFIBUS	**AXL F BK PB**	2688530	1

Accessories

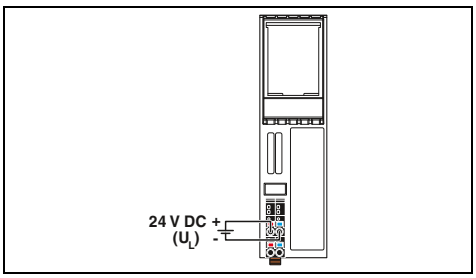
Axioline F bus base module (replacement part)	**AXL BS BK**	2701422	5

Power module

This module is designed for use within an Axioline F station.

Once the maximum load on a bus coupler has been reached for the Axioline F local bus supply, you can resupply the U_{Bus} communications power with the power module.

For supplying the U_{Bus} communications power



Technical data

Local bus interface		
Designation		Axioline F local bus
Connection method		Bus base module
Transmission speed		100 Mbps
Power supply for module electronics		
Supply of communications power U_L		24 V DC
Maximum permissible voltage range		19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Communications power U_{Bus}		5 V DC (via bus base module)
Current supply at U_{Bus}		max. 4 A
Protective circuit		Surge protection of the supply voltage Polarity reversal protection of the supply voltage
General data		
Connection method		Push-in connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight		107 g
Dimensions	W / H / D	35 mm / 126.1 mm / 54 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline F power module, complete with accessories (bus base module)	**AXL F PWR 1H**	2688297	1

Accessories

Axioline F bus base module (replacement part)	**AXL BS BK**	2701422	5

Digital input modules

new

IEC 61850-3

8 inputs,
with increased impulse withstand voltage

16 inputs

These modules are designed for use within an Axioline F station.

The digital input modules are used to connect 24 V DC sensors. Sensors with up to four wires can be connected.

Features:

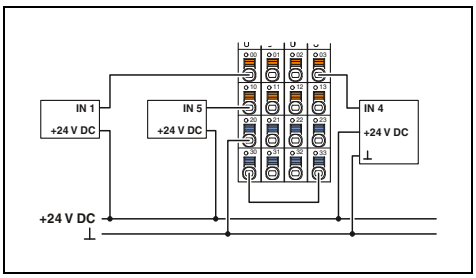
– Minimum update time of < 100 µs
– Adjustable filter times
– Maximum input frequency: 5 kHz
– Stored device rating plate
– Diagnostic and status indicators

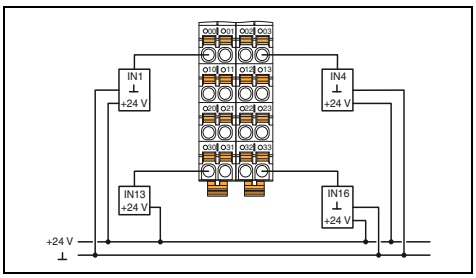
AXL DI 8/2... features:

– Impulse withstand voltage: 5 kV
– Developed in accordance with the requirements of IEC 61850-3

AXL DI 16/1 HS 1H features:

– Minimum update time of 5 µs





Technical data

		AXL F DI16/1 1H	AXL F DI16/1 HS 1H
Local bus interface			
Designation	Axioline F local bus	Axioline F local bus	
Connection method	Bus base module	Bus base module	
Power supply for module electronics			
Communications power U_{Bus}	5 V DC (via bus base module)	5 V DC (via bus base module)	
Current consumption from U_{Bus}	max. 120 mA	max. 120 mA	
I/O supply			
Supply of digital input modules U_I	-	24 V DC	
Supply voltage range U_I	-	19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
Current consumption from U_I	-	20 mA	
Protective circuit	-	Surge protection of the supply voltage Polarity reversal protection of the supply voltage	
Digital inputs			
Connection method	2-wire	1-wire	
Number of inputs	8	16	
Description of the inputs	according to EN 61131-2 type 1	EN 61131-2 types 1 and 3	
Nominal input voltage U_{IN}	24 V DC	24 V DC	
Nominal input current at U_{IN}	2.5 mA	2.4 mA	2.3 mA
Input filter time	< 1 ms	3000 µs (default) 1000 µs < 100 µs	< 5 µs
Protective circuit	Polarity reversal protection of the inputs	Polarity reversal protection of the inputs	
General data			
Connection method	Push-in connection	Push-in connection	
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
Weight	173 g	133 g	
Dimensions W / H / D	53.6 mm / 126.1 mm / 54 mm	35 mm / 126.1 mm / 54 mm	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline F digital input module, complete with accessories (bus base module)			
- 8 inputs, U_{IN} = 24 V DC	**AXL F DI8/2 24DC 1F**	2702783	1
- 8 inputs, U_{IN} = 48 V DC / 60 V DC	**AXL F DI8/2 48/60DC 1F**	2702654	1
- 8 inputs, U_{IN} = 110 V DC / 220 V DC	**AXL F DI8/2 110/220DC 1F**	2700684	1
- 16 inputs	**AXL F DI16/1 1H**	2688310	1
- 16 inputs	**AXL F DI16/1 HS 1H**	2701722	1
- 32 inputs			
- 64 inputs			
- For extended temperature range of -40°C ... +70°C			

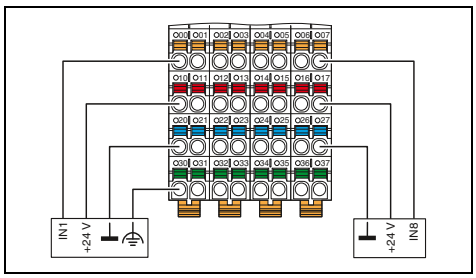
Accessories

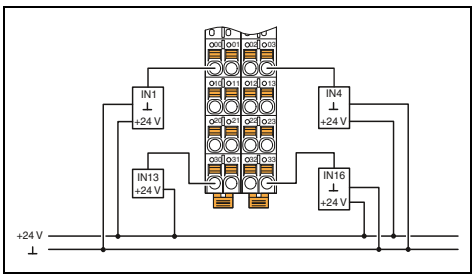
Axioline F bus base module (replacement part)	**AXL F BS F**	2688129	5
	AXL F BS H	2700992	5

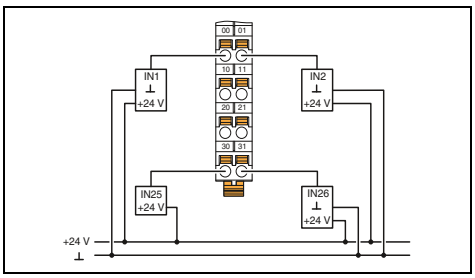
16 inputs

32 inputs

32 / 64 inputs







Technical data

Axioline F local bus	
Bus base module	
5 V DC (via bus base module)	
max. 120 mA	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
max. 4 A (2 A or each group of 8 inputs)	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
4-wire	
16	
EN 61131-2 types 1 and 3	
24 V DC	
2.4 mA	
500 µs (default)	
< 100 µs	
Polarity reversal protection of the inputs	
Push-in connection	
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
231 g	
53.6 mm / 129.9 mm / 54 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F DI16/4 2F	2688022	1
AXL F DI16/4 XC 2F	2701224	1

Accessories

AXL F BS F	2688129	5

Technical data

Axioline F local bus	
Bus base module	
5 V DC (via bus base module)	
max. 120 mA	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
max. 50 mA	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
1-wire	
32	
EN 61131-2 types 1 and 3	
24 V DC	
2.4 mA	
3000 µs (default)	
1000 µs	
< 100 µs	
Polarity reversal protection of the inputs	
Push-in connection	
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
159 g	
35 mm / 129.9 mm / 54 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F DI32/1 2H	2702052	1

Accessories

AXL F BS H	2700992	5

Technical data

	AXL F DI32/1 1F	AXL F DI64/1 2F
Axioline F local bus		
Bus base module		
5 V DC (via bus base module)		
max. 120 mA		
24 V DC		
19.2 V DC ... 30 V DC (including all tolerances, including ripple)		
max. 50 mA	max. 50 mA	max. 60 mA
Surge protection of the supply voltage		
Polarity reversal protection of the supply voltage		
1-wire		
32	32	64
EN 61131-2 types 1 and 3		
24 V DC		
2.4 mA		
3000 µs (default)		
1000 µs		
< 100 µs		
Polarity reversal protection of the inputs		
Push-in connection		
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16		
167 g / 231 g	167 g	231 g
53.6 mm / 126.1 mm / 54 mm / 53.6 mm / 129.9 mm / 54 mm	53.6 mm / 126.1 mm / 54 mm	53.6 mm / 129.9 mm / 54 mm

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F DI32/1 1F	2688035	1
AXL F DI64/1 2F	2701450	1
AXL F DI32/1 XC 1F	2701226	1

Accessories

AXL F BS F	2688129	5

Digital output modules

These modules are designed for use within an Axioline F station.

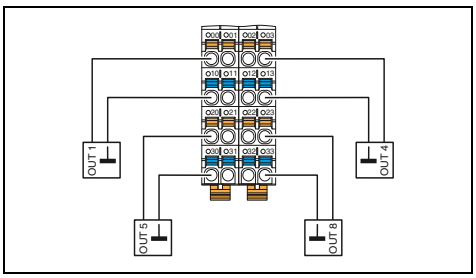
The digital output modules are used to output digital 24 V DC signals. Actuators with up to 3 wires can be connected.

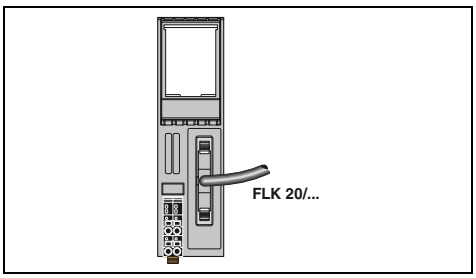
Features:

– Short-circuit-proof outputs
– Diagnostic and status indicators
– Output behavior can be adjusted for when local bus communication is aborted

8 outputs, 2 A

16 outputs, FLK20 connection for system cabling





Technical data

Local bus interface		
Designation	Axioline F local bus	Axioline F local bus
Connection method	Bus base module	Bus base module
Power supply for module electronics		
Communications power U_{Bus}	5 V DC (via bus base module)	5 V DC (via bus base module)
Current consumption from U_{Bus}	max. 150 mA	max. 120 mA
I/O supply		
Supply of digital output modules U_O	24 V DC	24 V DC
Supply voltage range U_O	19.2 V DC ... 30 V DC (including all tolerances, including ripple)	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Current consumption from U_O	max. 16 A (Provide external protection; if the total current of 8 A is exceeded, connect the supply at the power connector parallel via both terminal points.)	8 A (external fuse)
Protective circuit	Surge protection of the supply voltage Polarity reversal protection of the supply voltage	Surge protection of the supply voltage Polarity reversal protection of the supply voltage
Digital outputs		
Connection method	2-wire	FLK connector (20-pos.)
Number of outputs	8	16
Output voltage	24 V	24 V
Maximum output current per channel	2 A	500 mA
Maximum output current per module	16 A (external fuse)	8 A (external fuse)
Behavior with overload	Shutdown with automatic restart	Shutdown with automatic restart
Protective circuit	Short-circuit protection, overload protection of the outputs	Short-circuit protection, overload protection of the outputs
General data		
Connection method	Push-in connection	Push-in connection
Connection data solid/stranded/AWG	0.5 ... 1.5 mm² / 0.5 ... 1.5 mm² / 20 - 16	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	136 g	108 g
Dimensions W / H / D	35 mm / 126.1 mm / 54 mm	35 mm / 126.1 mm / 54 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline F digital output module, complete with accessories (bus base module) - 8 outputs - 16 outputs - 32 outputs - 64 outputs - For extended temperature range of -40°C ... +70°C	**AXL F DO8/2 2A 1H**	2688381	1
	AXL F DO16 FLK 1H	2701813	1

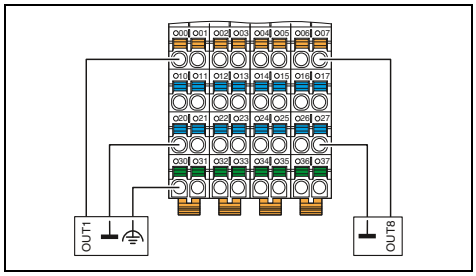
Accessories

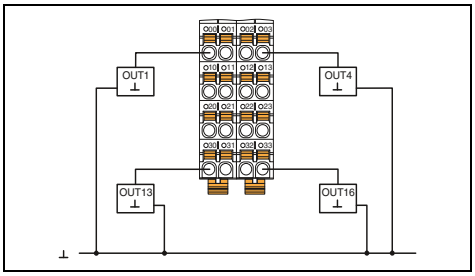
Axioline F bus base module (replacement part)	**AXL F BS H**	2700992	5
	AXL F BS H	2700992	5

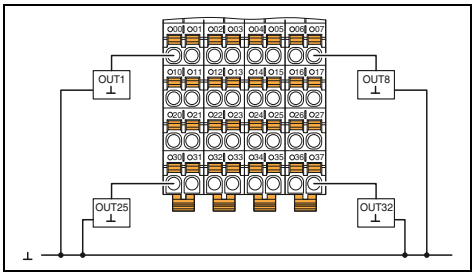
16 outputs

16 outputs

32/64 outputs







Technical data

Axioline F local bus	
Bus base module	
5 V DC (via bus base module)	
max. 120 mA	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
max. 8 A (external fuse)	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
3-wire	
16	
24 V	
500 mA	
8 A (external fuse)	
Shutdown with automatic restart	
Short-circuit protection, overload protection of the outputs	
Push-in connection	
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
234 g	
53.6 mm / 129.9 mm / 54 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F DO16/3 2F	2688048	1
AXL F DO16/3 XC 2F	2701228	1

Accessories

AXL F BS F	2688129	5

Technical data

Axioline F local bus	
Bus base module	
5 V DC (via bus base module)	
max. 120 mA	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
8 A (external fuse)	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
1-wire	
16	
24 V	
500 mA	
8 A (external fuse)	
Shutdown with automatic restart	
Short-circuit protection, overload protection of the outputs	
Push-in connection	
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
134 g	
35 mm / 126.1 mm / 54 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F DO16/1 1H	2688349	1

Accessories

AXL F BS H	2700992	5

Technical data

	AXL F DO32/1 1F	AXL F DO64/1 2F
Axioline F local bus		
Bus base module		
5 V DC (via bus base module)		
max. 120 mA		
24 V DC		
19.2 V DC ... 30 V DC (including all tolerances, including ripple)		
	max. 8 A (external fuse)	max. 16 A (for parallel supply, provide external protection)
Surge protection of the supply voltage		
Polarity reversal protection of the supply voltage		
1-wire		
	32	64
24 V		
500 mA		
	8 A (external fuse)	16 A (external fuse)
Shutdown with automatic restart		
Short-circuit protection, overload protection of the outputs		
Push-in connection		
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16		
	191 g	260 g
	53.6 mm / 126.1 mm / 54 mm	53.6 mm / 129.9 mm / 54 mm

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F DO32/1 1F	2688051	1
AXL F DO64/1 2F	2702053	1
AXL F DO32/1 XC 1F	2701230	1

Accessories

AXL F BS F	2688129	5

Digital output modules

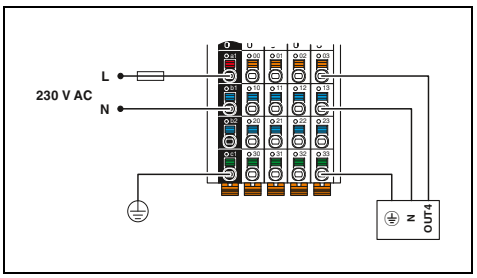
This module is designed for use within an Axioline F station.

The digital output module is used to output digital signals in the wide voltage range between 12 V AC and 253 V AC. Connection is via 2 or 3-wire technology.

Features:

– Output behavior can be adjusted for when local bus communication is aborted

4 outputs,
12 ... 253 V AC wide range



Technical data

Local bus interface		
Designation		Axioline F local bus
Connection method		Bus base module
Power supply for module electronics		
Communications power U_{Bus}		5 V DC (via bus base module)
Current consumption from U_{Bus}		max. 120 mA
I/O supply		
Supply of digital output modules U_O		230 V AC
Supply voltage range U_O		12 V AC ... 253 V AC (including all tolerances, including ripple, 50 ... 60 Hz)
Current consumption from U_O		max. 8 A (external fuse)
Protective circuit		Surge protection of the supply voltage
Digital outputs		
Connection method		3-wire
Number of outputs		4 (Triac outputs with zero voltage switch)
Output voltage		230 V AC
Maximum output current per channel		2 A AC
Maximum output current per module		8 A AC (external fuse)
Behavior with overload		Output may be damaged
Protective circuit		External protection required
General data		
Connection method		Push-in connection
Connection data solid/stranded/AWG		0.5 ... 1.5 mm² / 0.5 ... 1.5 mm² / 20 - 16
Weight		188 g
Dimensions	W / H / D	53.6 mm / 126.1 mm / 54 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline F digital output module, complete with accessories (bus base module)	**AXL F DO4/3 AC 1F**	2702068	1

Accessories

Axioline F bus base module (replacement part)	**AXL F BS F**	2688129	5

Digital output modules

IEC 61850-3

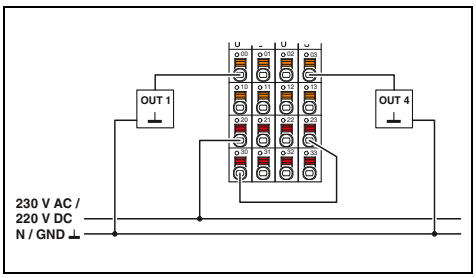
4 relay outputs

This module is designed for use within an Axioline F station.

The digital output module is used to output digital signals via relays with floating N/O contacts. Connection is via 2-wire technology.

Features:

– Impulse withstand voltage: 5 kV
– Developed in accordance with the requirements of IEC 61850-3
– Output behavior can be adjusted for when local bus communication is aborted



Technical data

Local bus interface		
Designation		Axioline F local bus
Connection method		Bus base module
Power supply for module electronics		
Communications power U_{Bus}		5 V DC (via bus base module)
Current consumption from U_{Bus}		max. 280 mA (all relays pick up)
Relay outputs		
Contact type		4 floating N/O contacts
Output voltage range		24 V DC ... 220 V DC -20 % / +15 % 24 V AC ... 230 V AC -20 % / +15 % (50/60 Hz)
Switching current		max. 8 A AC (cos phi = 1)
Switching capacity		max. 2000 VA
Switching rate		max. 6 (per minute)
Release time		< 5 ms
General data		
Connection method		Push-in connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight		206 g
Dimensions	W / H / D	53.6 mm / 126.1 mm / 54 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline F digital output module, complete with accessories (bus base module)	**AXL F DOR4/2 AC/220DC 1F**	2700608	1

Accessories

Axioline F bus base module (replacement part)	**AXL F BS F**	2688129	5

Digital input and output modules

These modules are designed for use within an Axioline F station.

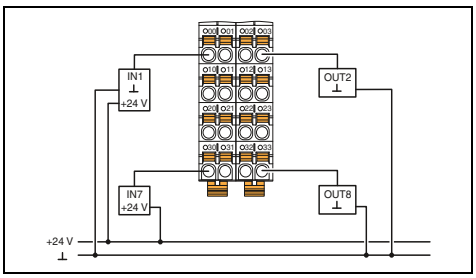
They are used to acquire and output digital 24 V DC signals.

You can adjust the filter times of the inputs to increase noise immunity.

Features:

– Connection of sensors or actuators in 1, 2 or 3-wire technology
– Minimum update time of < 100 µs
– Adjustable filter times
– Maximum input frequency: 5 kHz
– Short-circuit-proof outputs
– Diagnostic and status indicators
– Stored device rating plate

8 inputs and 8 outputs



Technical data

Local bus interface		
Designation		Axioline F local bus
Connection method		Bus base module
Power supply for module electronics		
Communications power U_{Bus}		5 V DC (via bus base module)
Current consumption from U_{Bus}		max. 120 mA
I/O supply		
Digital input and output module supply U_{IO}		24 V DC
Supply voltage range U_{IO}		19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Protective circuit		Surge protection of the supply voltage Polarity reversal protection of the supply voltage
Digital inputs		
Connection method		1-wire
Number of inputs		8
Description of the inputs		EN 61131-2 types 1 and 3
Nominal input voltage U_{IN}		24 V DC
Nominal input current at U_{IN}		2.4 mA
Input filter time		3000 µs (default) / 1000 µs / < 100 µs
Protective circuit		Polarity reversal protection of the inputs
Digital outputs		
Connection method		1-wire
Number of outputs		8
Output voltage		24 V DC
Maximum output current per channel		500 mA
Maximum output current per module		4 A (external fuse)
Behavior with overload		Shutdown with automatic restart
Protective circuit		Short-circuit protection, overload protection of the outputs
General data		
Connection method		Push-in connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight		133 g
Dimensions	W / H / D	35 mm / 126.1 mm / 54 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline F digital input/output module, complete with accessories (bus base module) - 8 inputs, 8 outputs	**AXL F DI8/1 DO8/1 1H**	2701916	1
- 16 inputs, 8 outputs - 16 inputs, 16 outputs - For extended temperature range of -40°C ... +70°C	**AXL F DI8/1 DO8/1 XC 1H**	2702017	1

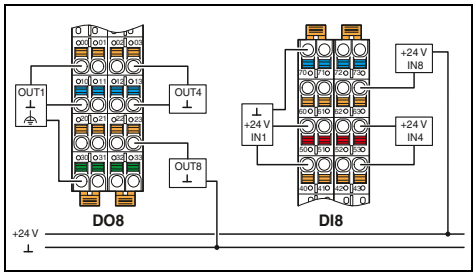
Accessories

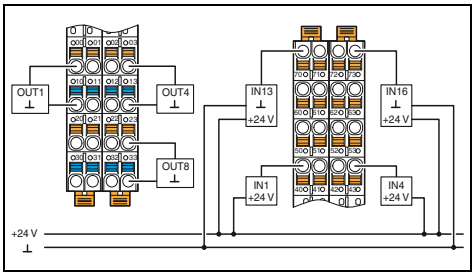
Axioline F bus base module (replacement part)	**AXL F BS H**	2700992	5

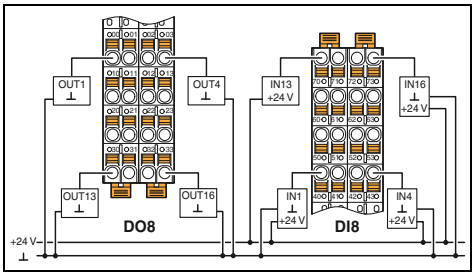
8 inputs and 8 outputs

16 inputs and 8 outputs, 2 A

16 inputs and 16 outputs







Technical data

Axioline F local bus	
Bus base module	
5 V DC (via bus base module)	
max. 120 mA	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
3-wire	1-wire
8	16
EN 61131-2 types 1 and 3	
24 V DC	
2.4 mA	
3000 µs (default) / 1000 µs / < 100 µs	
Polarity reversal protection of the inputs	
3-wire	2-wire
8	
24 V DC	
500 mA	
8 A (external fuse)	
Shutdown with automatic restart	
Short-circuit protection, overload protection of the outputs	
Push-in connection	
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
159 g	
35 mm / 129.9 mm / 54 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F DI8/3 DO8/3 2H	2702071	1

Accessories

AXL F BS H	2700992	5

Technical data

Axioline F local bus	
Bus base module	
5 V DC (via bus base module)	
max. 120 mA	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
1-wire	
16	
EN 61131-2 types 1 and 3	
24 V DC	
2.4 mA	
3000 µs (default) / 1000 µs / < 100 µs	
Polarity reversal protection of the inputs	
2-wire	1-wire
8	16
24 V DC	
2 A	500 mA
16 A (external fuse)	8 A (external fuse)
Shutdown with automatic restart	
Short-circuit protection, overload protection of the outputs	
Push-in connection	
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
159 g	
35 mm / 129.9 mm / 54 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F DI16/1 DO8/2-2A 2H	2702291	1

Accessories

AXL F BS H	2700992	5

Technical data

Axioline F local bus	
Bus base module	
5 V DC (via bus base module)	
max. 120 mA	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
1-wire	
16	
EN 61131-2 types 1 and 3	
24 V DC	
2.4 mA	
3000 µs (default) / 1000 µs / < 100 µs	
Polarity reversal protection of the inputs	
1-wire	
16	
24 V DC	
500 mA	
8 A (external fuse)	
Shutdown with automatic restart	
Short-circuit protection, overload protection of the outputs	
Push-in connection	
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
159 g	
35 mm / 129.9 mm / 54 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F DI16/1 DO16/1 2H	2702106	1

Accessories

AXL F BS H	2700992	5

Analog input modules

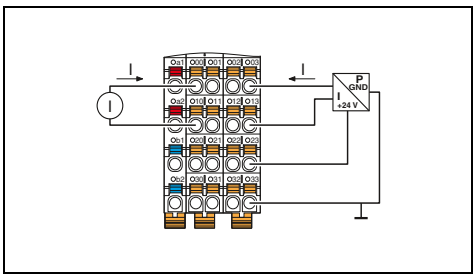
These modules are designed for use within an Axioline F station.

They are used to acquire standard analog current and voltage signals. Connection is via 2, 3 or 4-wire technology and a shield connection.

Features:

– Up to 8 analog differential signal inputs
– Current and voltage measuring ranges
– Input filter selection
– Minimum update time of 250 µs
– 16-bit measured value representation
– Stored device rating plate
– Integrated sensor supply

4 inputs
Current signals



Technical data

Local bus interface		
Designation		Axioline F local bus
Connection method		Bus base module
Power supply for module electronics		
Communications power U_{Bus}		5 V DC (via bus base module)
Current consumption from U_{Bus}		max. 150 mA
I/O supply		
Supply for analog modules U_A		24 V DC
Protective circuit		Surge protection Reverse polarity protection Transient protection
Analog inputs		
Connection method		2, 3, 4-wire
Number of inputs		4
Voltage input signal		-
Current input signal		0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Characteristics		
Measured value representation		16 bits (15 bits + sign bit)
Input filter		30 Hz, 12 kHz and mean-value generation (can be parameterized)
Precision		0.1 % (of measuring range final value for active mean-value generation and 30 Hz filter)
General data		
Connection method		Push-in connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight		145 g
Dimensions	W / H / D	35 mm / 126.1 mm / 54 mm

Ordering data

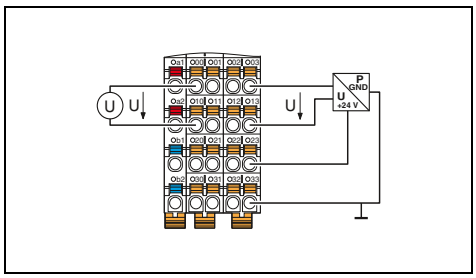
Description	Type	Order No.	Pcs./Pkt.
Axioline F analog input module, complete with accessories (bus base module)			
- 4 inputs	**AXL F AI4 I 1H**	2688491	1
- 8 inputs			
- For extended temperature range of -40°C ... +70°C	**AXL F AI4 I XC 1H**	2702007	1

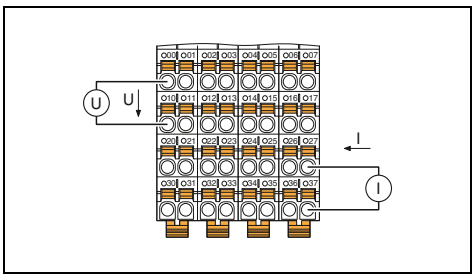
Accessories

Axioline F bus base module (replacement part)	**AXL F BS H**	2700992	5
Axioline shield connection set	**AXL SHIELD SET**	2700518	1

4 inputs
Voltage signals

8 inputs





Technical data

Axioline F local bus	Axioline F local bus
Bus base module	Bus base module
5 V DC (via bus base module)	5 V DC (via bus base module)
max. 150 mA	max. 130 mA
24 V DC	24 V DC
Surge protection	Surge protection
Reverse polarity protection	Reverse polarity protection
Transient protection	Transient protection
2, 3, 4-wire	2-wire
4	8
0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V	0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
-	0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
16 bits (15 bits + sign bit)	16 bits (15 bits + sign bit)
30 Hz, 12 kHz and mean-value generation (can be parameterized)	30 Hz, 12 kHz and mean-value generation (can be parameterized)
0.1 % (of measuring range final value for active mean-value generation and 30 Hz filter)	0.1 % (of measuring range final value for active mean-value generation and 30 Hz filter)
Push-in connection	Push-in connection
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
145 g	204 g
35 mm / 126.1 mm / 54 mm	53.6 mm / 126.1 mm / 54 mm

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F AI4 U 1H	2688501	1
AXL F AI4 U XC 1H	2702008	1

Accessories

AXL F BS H	2700992	5
AXL SHIELD SET	2700518	1

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F AI8 1F	2688064	1
AXL F AI8 XC 1F	2701232	1

Accessories

AXL F BS F	2688129	5
AXL SHIELD SET	2700518	1

Analog input and output modules

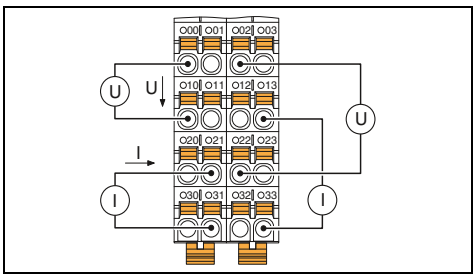
This module is designed for use within an Axioline F station.

It is used to acquire and output standard analog current and voltage signals. Connection is via 2-wire technology and a shield connection.

Features:

– 2 analog bipolar inputs and outputs each
– Current and voltage ranges
– Minimum update time of 250 µs
– 16-bit output value
– Overload and short-circuit protected
– Stored device rating plate

2 inputs and 2 outputs



Technical data

Local bus interface		
Designation		Axioline F local bus
Connection method		Bus base module
Power supply for module electronics		
Communications power U_{Bus}		5 V DC (via bus base module)
Current consumption from U_{Bus}		max. 150 mA
I/O supply		
Supply for analog modules U_A		24 V DC
Analog inputs		
Connection method		2-wire
Number of inputs		2
Voltage input signal		0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
Current input signal		0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Analog outputs		
Connection method		2-wire
Number of outputs		2
Voltage output signal		0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
Current output signal		0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Load/output load current output		≤ 500 Ω
Protective circuit		Short-circuit and overload protection Transient protection
Characteristics		
Representation of output values		16 bits (15 bits + sign)
Precision		0.1 % (of measuring range final value for active mean-value generation and 30 Hz filter) typ. 0.1 % (of output range final value)
General data		
Connection method		Push-in connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight		200 g
Dimensions	W / H / D	35 mm / 126.1 mm / 54 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline F analog I/O module, complete with accessories (bus base module)	**AXL F AI2 AO2 1H**	2702072	1

Accessories

Axioline F bus base module (replacement part)	**AXL F BS H**	2700992	5
Axioline shield connection set	**AXL SHIELD SET**	2700518	1

Analog output modules

These modules are designed for use within an Axioline F station.

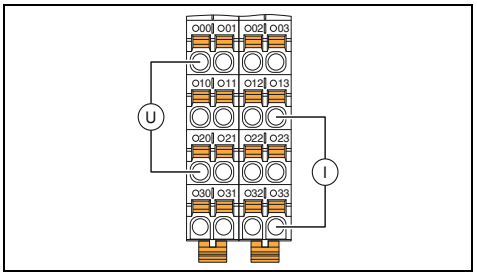
They are used to output standard analog current and voltage signals. Connection is via 2-wire technology and a shield connection.

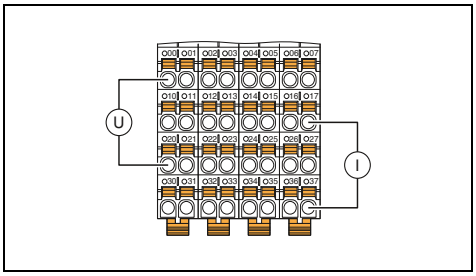
Features:

– Up to 8 analog bipolar outputs
– Current and voltage ranges
– Minimum update time of 250 µs
– 16-bit output value
– Overload and short-circuit protected
– Stored device rating plate

4 outputs

8 outputs





Technical data

Local bus interface		
Designation	Axioline F local bus	Axioline F local bus
Connection method	Bus base module	Bus base module
Power supply for module electronics		
Communications power U_{Bus}	5 V DC (via bus base module)	5 V DC (via bus base module)
Current consumption from U_{Bus}	max. 150 mA	max. 130 mA
I/O supply		
Supply for analog modules U_A	24 V DC	24 V DC
Analog outputs		
Connection method	2-wire	2-wire
Number of outputs	4	8
Voltage output signal	0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V	0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
Current output signal	0 mA ... 20 mA / 4 mA ... 20 mA	0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Load/output load current output	≤ 500 Ω	to 500 Ω
Protective circuit	Short-circuit and overload protection Transient protection	Short-circuit and overload protection Transient protection
Characteristics		
Representation of output values	16 bits (15 bits + sign)	16 bits (15 bits + sign)
Precision	typ. 0.1 % (of output range final value)	typ. 0.1 % (of output range final value)
General data		
Connection method	Push-in connection	Push-in connection
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	145 g	260 g
Dimensions W / H / D	35 mm / 126.1 mm / 54 mm	53.6 mm / 126.1 mm / 54 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline F analog output module, complete with accessories (bus base module)			
- 4 outputs	**AXL F AO4 1H**	2688527	1
- 8 outputs	**AXL F AO8 1F**	2688080	1
- For extended temperature range of -40°C ... +70°C	**AXL F AO4 XC 1H**	2702153	1
	AXL F AO8 XC 1F	2701237	1

Accessories

Axioline F bus base module (replacement part)	**AXL F BS H**	2700992	5
	AXL F BS F	2688129	5
Axioline shield connection set	**AXL SHIELD SET**	2700518	1
	AXL SHIELD SET	2700518	1

Temperature measurement modules

These modules are designed for use within an Axioline F station.

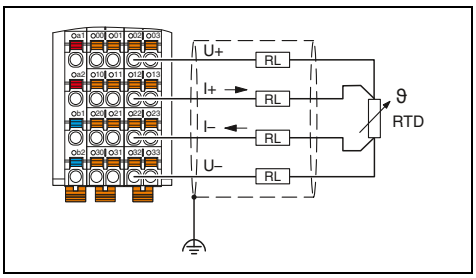
They are used to acquire data from resistive temperature sensors or thermocouples. Connection is via 2-, 3- or 4-conductor technology and an overall shield connection.

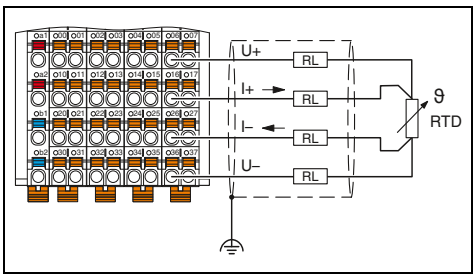
RTD features:
– 500 Ω and 5 kΩ linear inputs
– Programmable filters
– Short-circuit-proof inputs
– Stored device rating plate

Features of UTH:
– Linear voltages from -100 mV to +100 mV
– 1 input from -5 V to +5 V
– 4 Pt 100 inputs (external cold junction)
– Configurable cold junction type
– Stored device rating plate

4 RTD inputs

8 RTD inputs





		Technical data	Technical data
Local bus interface			
Designation		Axioline F local bus	Axioline F local bus
Connection method		Bus base module	Bus base module
Power supply for module electronics			
Communications power U_{Bus}		5 V DC (via bus base module)	5 V DC (via bus base module)
Current consumption from U_{Bus}		max. 140 mA	max. 180 mA
I/O supply			
Supply for analog modules U_A		24 V DC	24 V DC
Protective circuit		Surge protection Reverse polarity protection Transient protection	Surge protection Reverse polarity protection Transient protection
Analog inputs			
Connection method		2, 3, 4-wire (shielded)	2, 3, 4-wire (shielded)
Number of inputs		4 (for resistance temperature detectors)	8 (for resistance temperature detectors)
Protective circuit		Short-circuit protection, overload protection of the inputs Transient protection of inputs Transient protection of sensor supplies	Short-circuit protection, overload protection of the inputs Transient protection of inputs Transient protection of sensor supplies
Sensor types (RTD) that can be used		Pt, Ni, KTY, Cu sensors	Pt, Ni, KTY, Cu sensors
Sensor types that can be used (TC)		-	-
Linear resistance measuring range		0 Ω ... 500 Ω / 0 kΩ ... 5 kΩ	0 Ω ... 500 Ω / 0 kΩ ... 5 kΩ
Linear voltage range		-	-
Characteristics			
Measured value representation		16 bits (15 bits + sign bit)	16 bits (15 bits + sign bit)
Input filter time		40 ms / 60 ms / 100 ms / 120 ms (adjustable)	40 ms / 60 ms / 100 ms / 120 ms (adjustable)
Accuracy		typ. ± 0.1 K (Pt 100 with 3-wire connection)	typ. ± 0.1 K (Pt 100 with 3-wire connection)
General data			
Connection method		Push-in connection	Push-in connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight		144 g	215 g
Dimensions	W / H / D	35 mm / 126.1 mm / 54 mm	53.6 mm / 126.1 mm / 54 mm

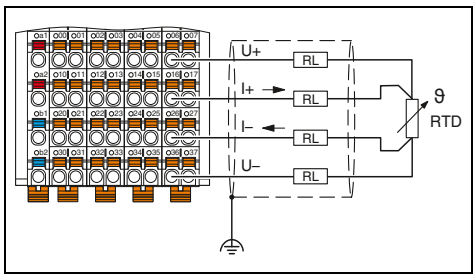
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Axioline F analog input module, complete with accessories (bus base module)						
- For connecting resistance temperature detectors	**AXL F RTD4 1H**	2688556	1	**AXL F RTD8 1F**	2688077	1
- For connecting thermocouple sensors						
- For extended temperature range of -40°C ... +70°C				**AXL F RTD8 XC 1F**	2701235	1

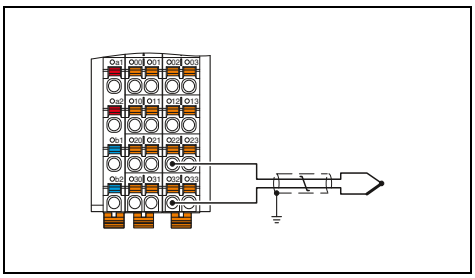
	Accessories			Accessories		
Axioline F bus base module (replacement part)	**AXL F BS H**	2700992	5	**AXL F BS F**	2688129	5
Axioline shield connection set	**AXL SHIELD SET**	2700518	1	**AXL SHIELD SET**	2700518	1

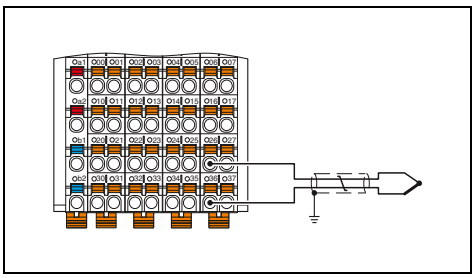
**8 RTD inputs,
high dynamic measuring range**

4 UTH inputs

8 UTH inputs







Technical data

Axioline F local bus	Axioline F local bus	Axioline F local bus
Bus base module	Bus base module	Bus base module
5 V DC (via bus base module)	5 V DC (via bus base module)	5 V DC (via bus base module)
max. 180 mA	max. 160 mA	max. 180 mA
24 V DC	24 V DC	
Surge protection	Surge protection of the supply voltage	Surge protection of the supply voltage
Reverse polarity protection	Polarity reversal protection of the supply voltage	Polarity reversal protection of the supply voltage
Transient protection	Transient protection	Transient protection
2, 4-wire (shielded)	2-wire (shielded, twisted pair)	2-wire (shielded, twisted pair)
8 (for resistance temperature detectors)	4 +1 (4 inputs for thermocouples or linear voltage, plus 1 input -5 V to +5 V)	8 +1 (8 inputs for thermocouples or linear voltage, plus 1 input -5 V to +5 V)
Short-circuit protection, overload protection of the inputs	Short-circuit protection, overload protection of the inputs	Short-circuit protection, overload protection of the inputs
Transient protection of inputs	Transient protection of inputs	Transient protection of inputs
Transient protection of sensor supplies		
Pt, Ni, Cu sensors	Pt 100 (2 external cold junctions, can also be used as a sensor input)	Pt 100 (4 external cold junctions, can also be used as a sensor input)
-	U, T, L, J, E, K, N, S, R, B, C, W, HK	U, T, L, J, E, K, N, S, R, B, C, W, HK
0 Ω ... 500 Ω	-	-
-	-100 mV ... 100 mV	-100 mV ... 100 mV
16 bits (15 bits + sign bit)	16 bits (15 bits + sign bit)	16 bits (15 bits + sign bit)
8 ms / 16 ms / 32 ms / 120 ms (adjustable)	40 ms / 60 ms / 100 ms / 120 ms (adjustable)	40 ms / 60 ms / 100 ms / 120 ms (adjustable)
typ. ± 0.1 K (Pt 100 with 4-wire connection)	typ. ± 0.19 K (Thermocouple type K, plus tolerance of cold junction)	typ. ± 0.19 K (Thermocouple type K, plus tolerance of cold junction)
Push-in connection	Push-in connection	Push-in connection
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
215 g	144 g	203 g
53.6 mm / 126.1 mm / 54 mm	35 mm / 126.1 mm / 54 mm	53.6 mm / 126.1 mm / 54 mm

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F RTD8 S 1F	2702120	1

Accessories

AXL F BS F	2688129	5
AXL SHIELD SET	2700518	1

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F UTH4 1H	2688598	1

Accessories

AXL F BS H	2700992	5
AXL SHIELD SET	2700518	1

Ordering data

Type	Order No.	Pcs./Pkt.
AXL F UTH8 1F	2688417	1

Accessories

AXL F BS F	2688129	5
AXL SHIELD SET	2700518	1

Serial communication module

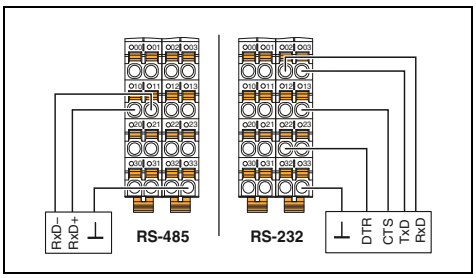
This module is designed for use within an Axioline F station.

It is used to connect devices with a serial interface, e.g., barcode scanners.

Features:

– Baud rates of up to 250 kBaud
– Communication via acyclic services or process data
– Support of various protocols (e.g., end-to-end protocol)
– 5 RS-232 hardware handshake signals with status indicator via LEDs
– Integrated RS-485/RS-422 termination resistor

1 serial input and output channel as RS-485/422 or RS-232 version



Technical data

Local bus interface	
Designation	Axioline F local bus
Connection method	Bus base module
Serial port	
Interface	RS-232, RS-485, RS-422
Connection method	Push-in connection
Power supply for module electronics	
Communications power U_{Bus}	5 V DC (via bus base module)
Current consumption from U_{Bus}	typ. 200 mA
Serial input/output channel	
Input buffer	4 kbyte
Output buffer	1 kbyte
Transmission speed	110 bps ... 250 kbps (can be parameterized)
Data bits	5 ... 8
Stop bits	1 or 2
Parity	Even, odd or no parity
Transmission type	Transparent mode, end-to-end mode, XON/XOFF, Modbus/RTU
General data	
Connection method	Push-in connection
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	135 g
Dimensions W / H / D	35 mm / 126.1 mm / 54 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline F communication module, complete with accessories (bus base module) - 1 serial input and output channel as RS-485/RS-422 or RS-232 version	**AXL F RS UNI 1H**	2688666	1
- For extended temperature range of -40°C ... +70°C	**AXL F RS UNI XC 1H**	2702006	1

Accessories

Axioline F bus base module (replacement part)	**AXL F BS H**	2700992	5
Axioline shield connection set	**AXL SHIELD SET**	2700518	1

Function/position detection module

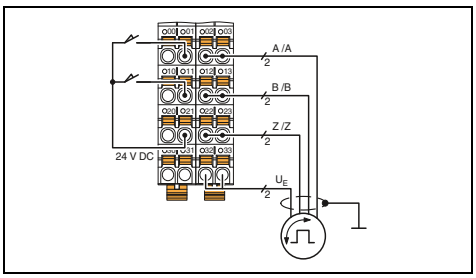
This module is designed for use within an Axioline F station.

It is used for counting pulses and for position detection using incremental encoders.

Features:

- Two counter inputs (32-bit)
- Two incremental encoder interfaces (32-bit)
- Symmetrical or asymmetrical encoders can be connected
- Maximum frequency of 300 kHz
- Eight digital inputs (gate, direction signal, latch, home position switch)
- Two digital outputs
- 5 V and 24 V sensor/encoder supply
- Encoder monitoring
- Rotary axis function
- Ten homing methods

**2 counter inputs,
2 incremental encoder interfaces**



Technical data

Local bus interface		
Designation		Axioline F local bus
Connection method		Bus base module
Power supply for module electronics		
Communications power U_{Bus}		5 V DC (via bus base module)
Current consumption from U_{Bus}		typ. 100 mA
I/O supply		
Supply of digital input modules U_I		24 V DC
Supply voltage range U_I		19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Protective circuit		Surge protection of the supply voltage Polarity reversal protection of the supply voltage
Counter input		
Number of inputs		2 (S1, S2)
Input frequency		max. 300 kHz (1 channel wired)
Input voltage		24 V DC
Encoder inputs		
Number of inputs		2 (A1, /A1, B1, /B1, Z1, /Z1; A2, /A2, B2, /B2, Z2, /Z2)
Encoder signals		Symmetrical and asymmetrical encoders
Input frequency		max. 300 kHz (1 channel wired)
Digital inputs		
Connection method		1-wire (optionally 2, 3-wire)
Number of inputs		8 (CNT: G1, G2, Dir1, Dir2; INC: Ref1, Ref2, L1, L2)
Description of the inputs		EN 61131-2, type 3
Nominal input voltage U_{IN}		24 V DC
Nominal input current at U_{IN}		2.5 mA (per channel)
Digital outputs		
Number of outputs		2 (Out1, Out2)
Output voltage		24 V DC
Maximum output current per channel		500 mA
Protective circuit		Short-circuit protection, overload protection of the outputs
General data		
Connection method		Push-in connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight		205 g
Dimensions	W / H / D	53.6 mm / 126.1 mm / 54 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline F special function module			
	AXL F CNT2 INC2 1F	2688093	1
- For extended temperature range of -40°C ... +70°C	**AXL F CNT2 INC2 XC 1F**	2701239	1

Accessories

Axioline F bus base module (replacement part)	**AXL F BS F**	2688129	5
Axioline shield connection set	**AXL SHIELD SET**	2700518	1

Position detection module

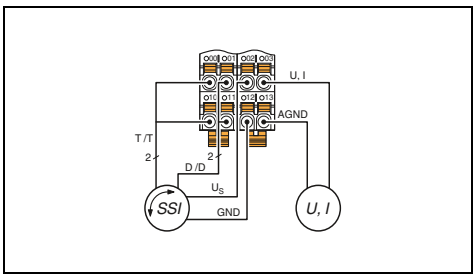
This module is designed for use within an Axioline F station.

This module enables you to record data from absolute encoders with SSI interface.

Features:

- Position detection using absolute encoders with SSI interface
- Encoder resolution up to 56 bits
- Transmission frequency of up to 2 MHz
- Gray or binary code
- Reversal of direction of rotation
- Synchronized transmission of encoder values
- Detailed encoder diagnostics
- Current and voltage measuring ranges
- 16-bit resolution of the analog output value
- D/A conversion time typically 5 µs

1 SSI interface for absolute encoder, 1 analog output



Technical data

Local bus interface		
Designation		Axioline F local bus
Connection method		Bus base module
Power supply for module electronics		
Communications power U_{Bus}		5 V DC (via bus base module)
Current consumption from U_{Bus}		max. 140 mA
I/O supply		
Supply U_l		24 V DC
Protective circuit		Surge protection Reverse polarity protection Transient protection
Encoder inputs		
Input name		SSI interface
Number of inputs		1
Transmission frequency		2 MHz
Adjustable resolution		8 ... 56 bit
Analog outputs		
Connection method		2-wire (shielded, twisted pair)
Number of outputs		1
Voltage output signal		0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
Current output signal		0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Load/output load current output		max. 500 Ω
Protective circuit		Surge protection Short-circuit and overload protection Transient protection
Precision		typ. 0.1 % (of output range final value)
Characteristics		
Representation of output values		16 bits (15 bits + sign)
General data		
Connection method		Push-in connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight		135 g
Dimensions	W / H / D	35 mm / 126.1 mm / 54 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline F special function module			
	AXL F SSI1 AO1 1H	2688433	1

Accessories

Axioline F bus base module (replacement part)	**AXL F BS H**	2700992	5
Axioline shield connection set	**AXL SHIELD SET**	2700518	1

Position detection module

new

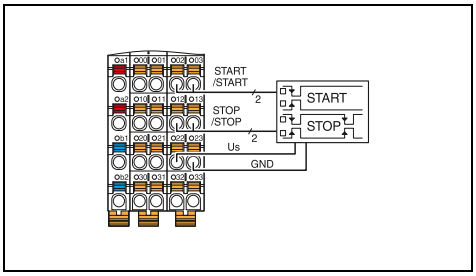
This module is designed for use within an Axioline F station.

It is used to evaluate magnetostrictive position sensors with a start/stop interface.

Features:

– 2 channels for magnetostrictive position sensors with start/stop interface
– 5 stop events per channel
– Automatic parameter upload
– 4 digital inputs
– Device rating plate stored
– Diagnostic and status indicators
– Can be used under extreme ambient conditions
– Extended temperature range (-40 °C ... +70 °C)
– Partially coated PCBs

2 digital pulse interfaces for evaluating magnetostrictive position sensors



Technical data

Local bus interface		
Designation		Axioline F local bus
Connection method		Bus base module
Power supply for module electronics		
Communications power U_{Bus}		5 V DC (via bus base module)
Current consumption from U_{Bus}		max. 150 mA
I/O supply		
Supply of digital input modules U_I		24 V DC
Supply voltage range U_I		19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Protective circuit		Surge protection Reverse polarity protection Transient protection
Input for magnetostrictive encoders		
Encoder length range		50 mm ... 10 m
Resolution (measuring length)		1 µm
Ultra-sound speed (gradient)		2400 m/s ... 3100 m/s
Digital inputs		
Connection method		1-wire
Number of inputs		4
Description of the inputs		EN 61131-2 types 1 and 3
Nominal input voltage U_{IN}		24 V DC
Nominal input current at U_{IN}		2.4 mA
General data		
Connection method		Push-in connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight		135 g
Dimensions	W / H / D	35 mm / 126.1 mm / 54 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline F special function module			
	AXL F IMPULSE2 XC 1H	2702655	1

Accessories

Axioline F bus base module (replacement part)	**AXL F BS H**	2700992	5
Axioline shield connection set	**AXL SHIELD SET**	2700518	1

For the control cabinet (IP20) — Inline

Product overview

Bus couplers

EtherCAT	EtherNet/IP	Modbus/TCP (UDP)	sercos the automation bus	PROFINET	CANopen
126	127	127	127	128	130

DeviceNet	INTERBUS	Modbus/RTU	PROFIBUS	MUX	
129	131	132	133	133	

Modular controllers

Performance class	
100	300
80	84

Power, segment, and accessory terminals

Power terminals			Boost terminals	Segment terminals	Potential distribution terminals	
24 V DC	120 V AC	230 V AC		24 V DC	24 V DC	GND
134	135	135	136	138	139	139

Inline ECO

Digital input	Digital output	Analog input	Analog output	Temperature recording	Function terminals
8 channels	4 - 8 channels	4 channels	4 channels	UTH / RTD	Communication
141	141	142	142	143	144

Input and output terminals

Digital input	Digital output	Analog input	Strain gauge	Analog output	Temperature recording
1 - 32 channels	1 - 32 channels	2 - 8 channels	2 channels	1 - 8 channels	UTH / RTD / TC
146	152	158	162	166	164

Intrinsically safe terminals (Ex i)

PWR	DIO	AIO	TEMP
24 V	4/4 channels	4/4 channels	4 channels (RTD/TC)
168	169	169	169

Safe I/Os

SafetyBridge Technology	PROFIsafe
296	299

Function terminals

Branch	Communication	Counter/PWM	Position detection and position controller
170	172	179	182

Power-level terminals

Servo amplifier Direct starter Reversing-load starter
185

General accessories

IB IL FIELD ...
Marking fields

ESL 62X...
Labeling sheets

ZBF 6-...
Zack marker strip labeling

IL CP
Coding profile

CLIPFIX 35-5
Standard end bracket

FLKM 14-PA-INLINE/...
VARIOFACE front adapters

I-L ATP GN
End cover plate

phoenixcontact.net/products

General technical data

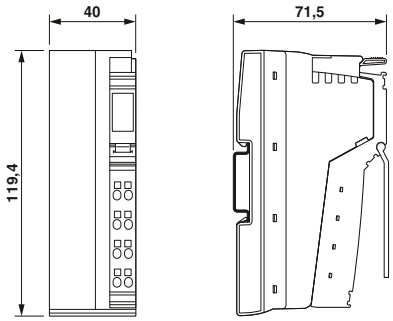
Ambient conditions	
Operating temperature range - ECO terminals - extended (...-XC modules)	-25°C ... +55°C 0°C ... +55°C -40°C ... +70°C
Relative humidity (operation)	5% to 95% (non-condensing)
Relative humidity (storage)	5% to 95% (non-condensing)
Vibration	5g, 2 hours in each space direction according to IEC 60068-2-6
Shock	25g, over 11 ms according to IEC 60068-2-6
Degree of protection	IP20 (according to IEC 60529)

Electromagnetic compatibility	
Noise emission	EN 61000-6-3
Noise emission of housing	EN 55011 Class A
Noise immunity	EN 61000-6-2

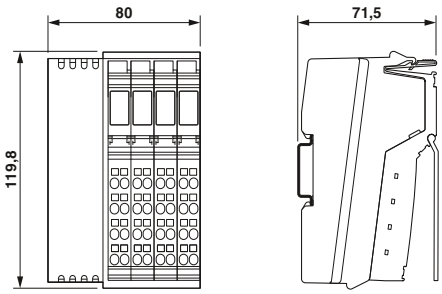
Housing types and dimensions

Bus coupler

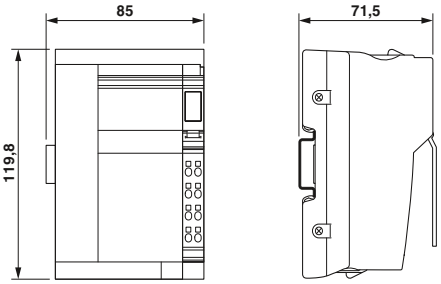
BK housing



BK IO housing

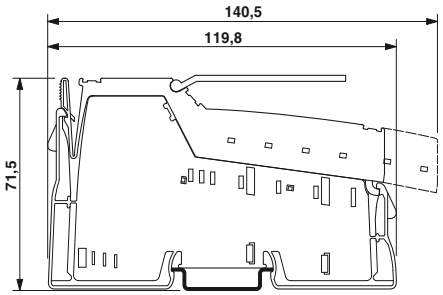


Container housing

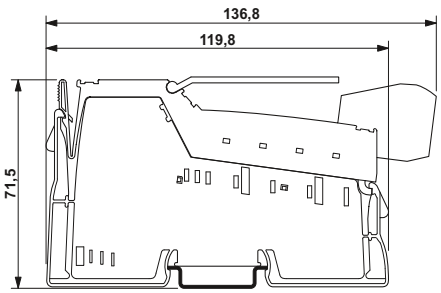


I/O terminals

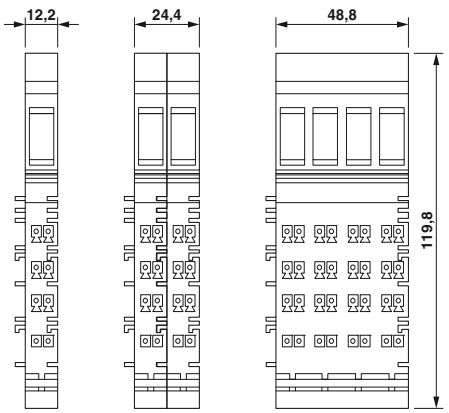
Electronics base with standard and double signal connector



Electronics base with shield plug



Terminal widths



Bus couplers

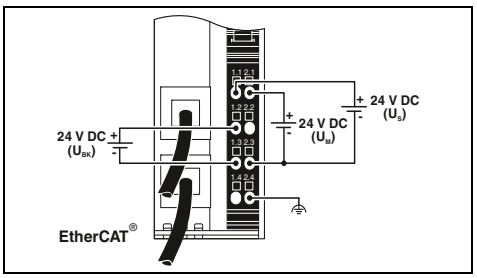
new

The Inline bus couplers are the link between the Inline I/O system and the higher-level network.

Features:

– Up to 63 terminals (maximum of 16 PCP devices) can be connected

RJ45 connection



Technical data

Interface		
Fieldbus system		EtherCAT®
Connection method		RJ45 socket
Transmission speed		100 Mbps (Full duplex)
Local bus interface		
Connection method		Inline data jumper
Number of local bus devices that can be connected		max. 63
Power supply for module electronics		
Supply voltage		24 V DC (via Inline plug)
Supply voltage range		19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Max. current consumption		0.9 A
Power supply at U_L		max. 0.8 A
Power supply at U_{ANA}		max. 0.5 A DC
Digital inputs		
Connection method		-
Number of inputs		-
Description of the inputs		-
Typical response time		-
Protective circuit		-
Digital outputs		
Connection method		-
Number of outputs		-
Maximum output current per channel		-
Protective circuit		-
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Dimensions	W / H / D	40 mm / 119.4 mm / 71.5 mm
Ambient temperature (operation)		-25 °C ... 55 °C
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Bus coupler, complete with accessories (connector and marking field)	**IL EC BK-PAC**	2702507	1

Accessories

Plug set for bus coupler	**IL BKDIO-PLSET**	2878599	1

EtherNet/IP

RJ45 connection,
8 digital inputs and 4 digital outputs

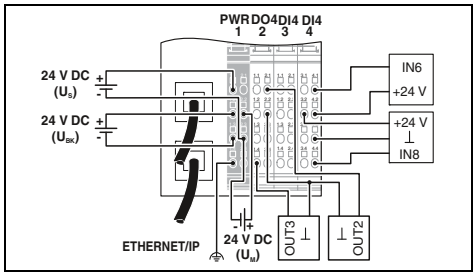
Modbus/TCP (UDP)

RJ45 connection,
8 digital inputs and 4 digital outputs

sercos
the automation bus

RJ45 connection,
8 digital inputs and 4 digital outputs

Ex:



Technical data

EtherNet/IP™
RJ45 socket
10/100 Mbps (half or full duplex (automatic detection))

Inline data jumper
max. 61 (on board I/Os are two devices)

24 V DC (via Inline plug)
19.2 V DC ... 30 V DC (including all tolerances, including ripple)

0.98 A
max. 0.8 A DC
max. 0.5 A DC

3-wire
8
EN 61131-2 type 1
approx. 500 µs
Reverse polarity protection

3-wire
4
500 mA
Short-circuit and overload protection

Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
80 mm / 119.8 mm / 71.5 mm
-25 °C ... 55 °C
Class A product, see page 525

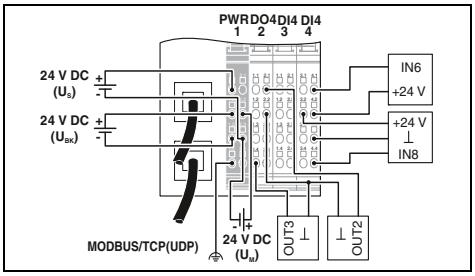
Ordering data

Type	Order No.	Pcs./Pkt.
IL EIP BK DI8 DO4 2TX-PAC	2897758	1

Accessories

IL BKDIO-PLSET	2878599	1

Ex:



Technical data

Modbus/TCP (UDP)
RJ45 socket
10/100 Mbps

Inline data jumper
max. 61 (on board I/Os are two devices)

24 V DC (via Inline plug)
19.2 V DC ... 30 V DC (including all tolerances, including ripple)

0.98 A
max. 0.8 A DC
max. 0.5 A DC

3-wire
8
EN 61131-2 type 1
approx. 500 µs
Reverse polarity protection

3-wire
4
500 mA
Short-circuit and overload protection

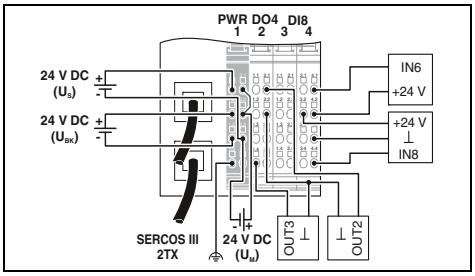
Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
80 mm / 119.8 mm / 71.5 mm
-25 °C ... 55 °C
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
IL ETH BK DI8 DO4 2TX-PAC	2703981	1

Accessories

IB IL SCN-8-CP	2727608	10



Technical data

Sercos
RJ45 socket
100 Mbps

Inline data jumper
max. 61 (on board I/Os are two devices)

24 V DC (via Inline plug)
19.2 V DC ... 30 V DC (including all tolerances, including ripple)

1.05 A
max. 0.8 A DC
max. 0.5 A DC

3-wire
8
IEC 61131-2 type 1
approx. 500 µs
Reverse polarity protection

3-wire
4
500 mA
Short-circuit and overload protection

Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
80 mm / 119.8 mm / 71.5 mm
-25 °C ... 55 °C
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
IL S3 BK DI8 DO4 2TX-PAC	2692380	1

Accessories

IL BKDIO-PLSET	2878599	1

Bus couplers

The Inline bus couplers are the link between the Inline I/O system and the higher-level network.

Features:

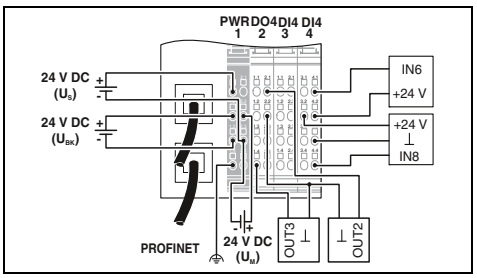
– Up to 61 terminals (maximum of 16 PCP devices) can be connected

DeviceNet™ features

– Address can be set via DIP switches or software

**RJ45 connection,
8 digital inputs and 4 digital outputs**

Ex:



Technical data

Interface		
Fieldbus system		PROFINET
Connection method		RJ45 socket, auto negotiation
Transmission speed		100 Mbps (acc. to PROFINET standard)
Local bus interface		
Connection method		Inline data jumper
Number of local bus devices that can be connected		max. 61 (on board I/Os are two devices)
Power supply for module electronics		
Supply voltage		24 V DC (via Inline plug)
Supply voltage range		19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Max. current consumption		138 mA
Power supply at U_L		max. 0.8 A DC
Power supply at U_{ANA}		max. 0.5 A DC
Digital inputs		
Connection method		2, 3-wire
Number of inputs		8
Description of the inputs		EN 61131-2 type 1
Typical response time		approx. 500 µs
Protective circuit		Reverse polarity protection
Digital outputs		
Connection method		2, 3-wire
Number of outputs		4
Maximum output current per channel		500 mA
Protective circuit		Short-circuit and overload protection
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Dimensions	W / H / D	80 mm / 119.8 mm / 71.5 mm
Ambient temperature (operation)		-25 °C ... 55 °C (observe derating)
EMC note		Class A product, see page 525

Ordering data

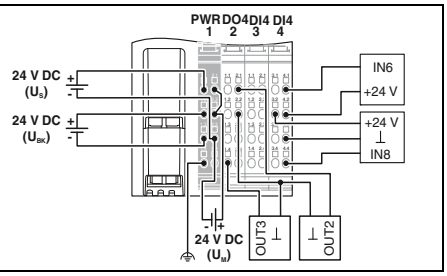
Description	Type	Order No.	Pcs./Pkt.
Bus coupler, complete with accessories (connector and marking field)	**IL PN BK DI8 DO4 2TX-PAC**	2703994	1

Accessories

Plug set for bus coupler	**IL BKDIO-PLSET**	2878599	1

SC-RJ connection,
8 digital inputs and 4 digital outputs

Ex:



Technical data

PROFINET
SC-RJ socket
100 Mbps (acc. to PROFINET standard)

Inline data jumper
max. 61 (on board I/Os are two devices)

24 V DC (via Inline plug)
19.2 V DC ... 30 V DC (including all tolerances, including ripple)

0.83 A DC
max. 0.8 A DC
max. 0.5 A DC

3-wire
8
EN 61131-2 type 1
approx. 500 µs
Reverse polarity protection

3-wire
4
500 mA
Short-circuit and overload protection

Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
80 mm / 119.8 mm / 71.5 mm
-25 °C ... 55 °C (observe derating)
Class A product, see page 525

Ordering data

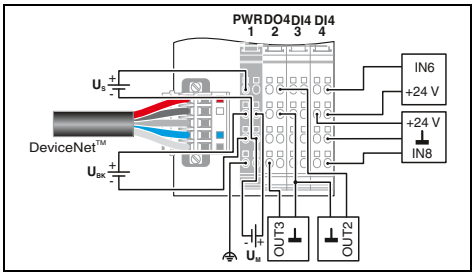
Type	Order No.	Pcs./Pkt.
IL PN BK DI8 DO4 2SCRJ-PAC	2878379	1

Accessories

IL BKDIO-PLSET	2878599	1

MINI-COMBICON connection,
8 digital inputs and 4 digital outputs

Ex:



Technical data

DeviceNet™
TWIN COMBICON
500 kbps, 250 kbps, 125 kbps (Can be set via DIP switch or programmed)

Inline data jumper
max. 61 (on board I/Os are two devices)

24 V DC (via Inline plug)
19.2 V DC ... 30 V DC (including all tolerances, including ripple)

0.9 A
max. 0.8 A DC
max. 0.5 A DC

3-wire
8
EN 61131-2 type 1
approx. 500 µs
Reverse polarity protection

3-wire
4
500 mA
Short-circuit and overload protection

Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
80 mm / 119.8 mm / 71.5 mm
-25 °C ... 55 °C
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
IL DN BK DI8 DO4-PAC	2897211	1

Accessories

IL BKDIO-PLSET	2878599	1

Bus couplers

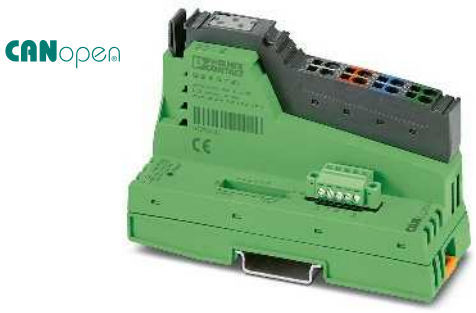
The Inline bus couplers are the link between the Inline I/O system and the higher-level network.

Features:

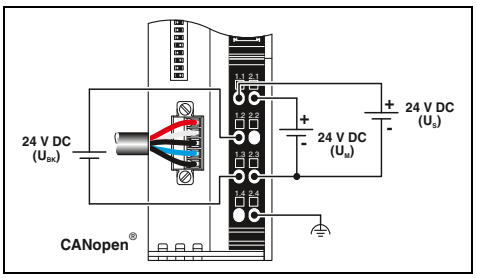
– Up to 63 terminals (maximum of 16 PCP devices) can be connected

CANopen® features:

– Address can be set via DIP switches or software



MINI COMBICON connection



Technical data

Interface		
Fieldbus system		CANopen®
Connection method		MINI COMBICON
Transmission speed		1 Mbps, 800 kbps, 500 kbps, 250 kbps, 125 kbps, 50 kbps, 20 kbps, 10 kbps (Can be set via DIP switch or automatic detection)
Local bus interface		
Connection method		Inline data jumper
Number of local bus devices that can be connected		max. 63
Maximum distance to the next remote bus device		-
Power supply for module electronics		
Supply voltage		24 V DC (via Inline plug)
Supply voltage range		19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Max. current consumption		0.9 A
Power supply at U_L		max. 0.8 A
Power supply at U_{ANA}		max. 0.5 A DC
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Dimensions	W / H / D	40 mm / 119.4 mm / 71.5 mm
Ambient temperature (operation)		-25 °C ... 55 °C
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Bus coupler, complete with accessories (connector and marking field)			
	IL CO BK-PAC	2702230	1
- For extended temperature range of -40°C ... +70°C	**IL CO BK-XC-PAC**	2702635	1
- 45° angled fiber optic connection - FO connection and FO remote bus branch			

Accessories

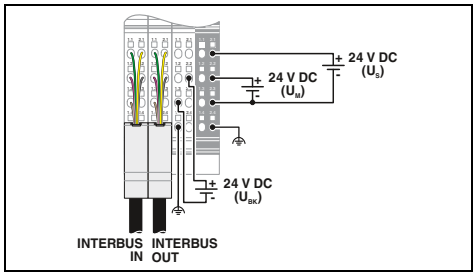
Inline plug	**IB IL SCN-8-CP**	2727608	10

Inline shield plug connection

D-SUB connection

45° angled fiber optic connection

Ex:



Technical data

INTERBUS
Inline shield plug
500 kbps

Inline data jumper
max. 63
400 m

24 V DC (via Inline plug)
19.2 V DC ... 30 V DC (including all tolerances, including ripple)

1.25 A
max. 2 A DC (observe derating)
max. 0.5 A DC (observe derating)

Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
48.8 mm / 135 mm / 71.5 mm
-25 °C ... 55 °C
Class A product, see page 525

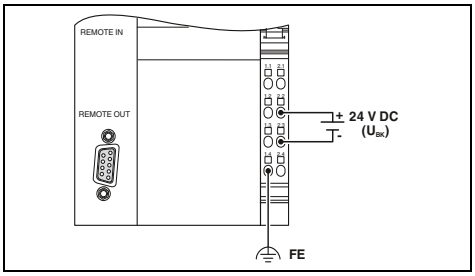
Ordering data

Type	Order No.	Pcs./Pkt.
IBS IL 24 BK-T/U-PAC	**2861580**	1
IBS IL 24 BK-T/U-XC-PAC	**2701150**	1

Accessories

IB IL BK-PLSET/CP	**2860374**	1

Ex:



Technical data

INTERBUS
D-SUB-9 socket/D-SUB 9 connector
500 kbps

Inline data jumper
max. 63
400 m

24 V DC (via Inline plug)
19.2 V DC ... 30 V DC (including all tolerances, including ripple)

1.25 A
max. 2 A DC (observe derating)
max. 0.5 A DC (observe derating)

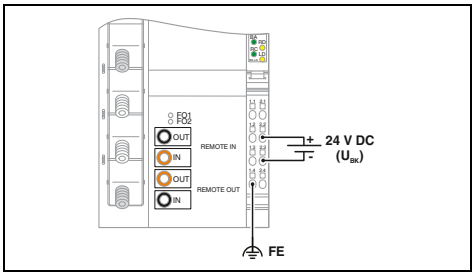
Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
85 mm / 119.8 mm / 71.5 mm
-25 °C ... 55 °C
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
IBS IL 24 BK-DSUB-PAC	**2861593**	1

Accessories

IB IL SCN-8-CP	**2727608**	10



Technical data

	IBS IL 24 BK-LK/45-PAC	IBS IL 24 BK RB-LK-PAC
	INTERBUS F-SMA plug 500 kbps	
	Inline data jumper max. 63 400 m	
	24 V DC (via Inline plug) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
	1.25 A max. 2 A DC (observe derating) max. 0.5 A DC (observe derating)	1.3 A
	Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 85 mm / 119.8 mm / 71.5 mm -25 °C ... 55 °C Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
IBS IL 24 BK-LK/45-PAC	**2862165**	1
IBS IL 24 BK RB-LK-PAC	**2861506**	1

Accessories

IB IL SCN-8-CP	**2727608**	10

Bus couplers

The Inline bus couplers are the link between the Inline I/O system and the higher-level network.

Bus coupler features:
– Up to 63 terminals (16 PCP devices) can be connected
– Address can be set via rotary coding or DIP switches

The **field multiplexer**, together with the connected I/O terminals, forms one station. A system consists of a station and remote station with complementary arrangement of the I/O terminals.

MUX features:
– Maximum of 32 terminals per station
– Up to 512 digital or 32 analog I/Os (or a mixture) can be connected

Digital and analog Inline I/O terminals that can be used on the field multiplexer are indicated in this catalog with the adjacent logo.

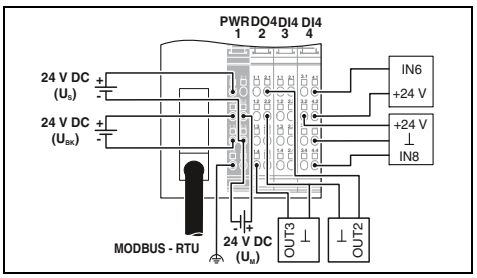
Notes:

You will find a multiplexer application on an SD card for configuring two ILC 131 ETH modular small-scale controllers as multiplexers in this catalog on page 91

Modbus/RTU

**D-SUB connection,
8 digital inputs and 4 digital outputs**

Ex:



Technical data

Interface		
Fieldbus system		Modbus/RTU
Connection method		D-SUB-9 socket
Transmission speed		1.2 kbps ... 115.2 kbps
Local bus interface		
Connection method		Inline data jumper
Number of local bus devices that can be connected		max. 61 (on board I/Os are two devices)
Power supply for module electronics		
Supply voltage		24 V DC (via Inline plug)
Supply voltage range		19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Max. current consumption		0.98 A
Power supply at U_L		max. 0.8 A DC
Power supply at U_{ANA}		max. 0.5 A DC
Digital inputs		
Connection method		3-wire
Number of inputs		8
Description of the inputs		EN 61131-2 type 1
Typical response time		approx. 500 µs
Protective circuit		Reverse polarity protection
Digital outputs		
Connection method		3-wire
Number of outputs		4
Maximum output current per channel		500 mA
Protective circuit		Short-circuit and overload protection
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Dimensions	W / H / D	80 mm / 119.8 mm / 71.5 mm
Ambient temperature (operation)		-25 °C ... 55 °C
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Bus coupler, complete with accessories (connector and marking field)	**IL MOD BK DI8 DO4-PAC**	2878696	1
- For extended temperature range of -40°C ... +70°C			

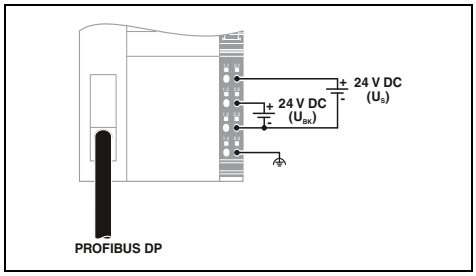
Accessories

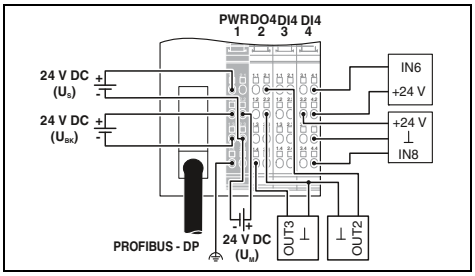
Plug set for bus coupler	**IL BKDIO-PLSET**	2878599	1
D-SUB connector, 9-pos. with two cable entries, termination resistor can be switched on via slide switch	**SUBCON-PLUS-MODBUS/IL/BK**	2310808	1
Adapter cable, Inline field multiplexer on PSI-MOS module			

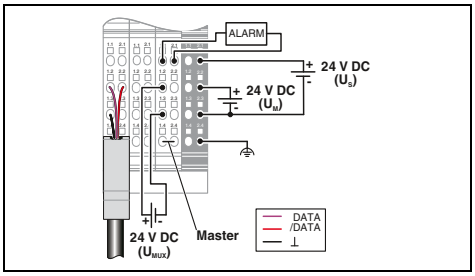
D-SUB connection

**D-SUB connection,
8 digital inputs and 4 digital outputs**

**Field multiplexer,
copper connection**







Technical data

PROFIBUS DP D-SUB-9 socket 9.6 kbps ... 12 Mbps	
Inline data jumper max. 63	
24 V DC 19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
1.25 A max. 2 A DC max. 0.5 A DC	
-	
-	
-	
-	
-	
-	
-	
-	
-	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 85 mm / 119.8 mm / 71.5 mm 0 °C ... 55 °C Class A product, see page 525	

Technical data

PROFIBUS DP D-SUB-9 socket 9.6 kbps ... 12 Mbps	
Inline data jumper max. 61 (on board I/Os are two devices)	
24 V DC (via Inline plug) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
0.98 A max. 0.8 A DC max. 0.5 A DC	
3-wire 8 EN 61131-2 type 1 approx. 500 µs Reverse polarity protection	
3-wire 4 500 mA Short-circuit and overload protection	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 80 mm / 119.8 mm / 71.5 mm -25 °C ... 55 °C Class A product, see page 525	

Technical data

RS-485 Inline shield plug -	
Inline data jumper 32 (without additional power terminal block, observe allowable total current consumption)	
24 V DC (via Inline plug) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
1.25 A max. 2 A DC (observe derating) max. 0.5 A DC (observe derating)	
-	
-	
-	
-	
-	
-	
-	
-	
-	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 48.8 mm / 135 mm / 71.5 mm -25 °C ... 55 °C Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
IL PB BK DP/V1-PAC	2862246	1

Accessories

IL BKDIO-PLSET	2878599	1
SUBCON-PLUS-PROFIB	2744348	1

Ordering data

Type	Order No.	Pcs./Pkt.
IL PB BK DI8 DO4/EF-PAC	2692322	1
IL PB BK DI8 DO4/EF-XC-PAC	2702132	1

Accessories

IL BKDIO-PLSET	2878599	1
SUBCON-PLUS-PROFIB	2744348	1

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 MUX MA-PAC	2861205	1

Accessories

IB IL MUX-CAB PSI	2878476	1

Power terminals

Inline Power terminals are used to supply, protect, and diagnose the individual voltage routing within an Inline station.

Depending on the terminal type, various functions can be implemented.

Supply of:

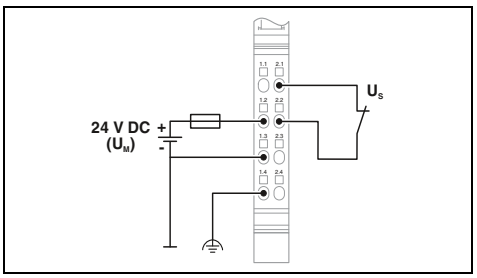
– Main circuit (U_M) up to 8 A
– Segment circuit (U_S) for the I/O supply up to 8 A

The IB IL DOR LV-SET-PAC distance terminal set creates the specified creepage distance when using AC terminals (gray housing). For example, when using IB IL 24/230 DOR 4/W-PAC relay terminals, the two end terminals interrupt all 24 V circuits as well as GND and functional earth ground.

AC Power terminals for 120 V AC or 230 V AC already include distance terminals.

24 V DC supply for U_M and U_S

Ex:



Technical data

Local bus interface		
Connection method		Inline data jumper
Power supply for module electronics		
Main circuit supply U_M		24 V DC
Supply voltage range U_M		19.2 V ... 30 V (including all tolerances, including ripple)
Power supply at U_M		8 A
Communications power U_L		-
Power supply at U_L		-
Current consumption from U_L		-
I/O supply voltage U_{ANA}		-
Power supply at U_{ANA}		-
Segment circuit supply U_S		24 V DC
Power supply at U_S		8 A
Fuse		-
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Protective circuit		Surge protection Suppressor diode
Weight		59 g
Dimensions	W / H / D	12.2 mm / 119.8 mm / 71.5 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline power terminal, complete with accessories (connector and marking field)			
- With fuse	**IB IL 24 PWR IN-PAC**	2861331	1
- For extended temperature range of -40°C ... +70°C	**IB IL 24 PWR IN-XC-PAC**	2701161	1
- With fuse and diagnostics			
- With fuse and fuse diagnostics			

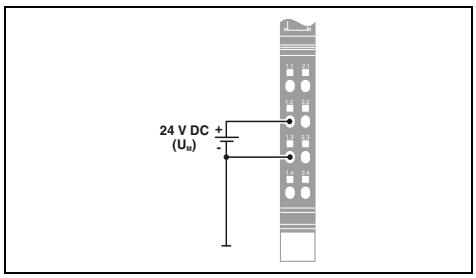
Accessories

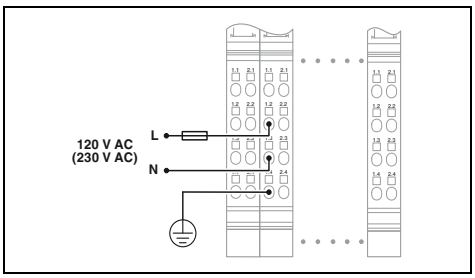
Inline distance terminal			

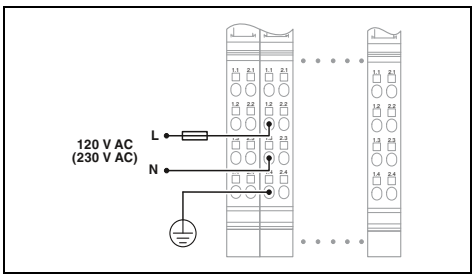
24 V DC supply for U_M and U_S, with fuse and diagnostics

120 V AC supply for U_L

230 V AC supply for U_L, with fuse and diagnostics as an option







Technical data

IB IL 24 PWR IN/2-F-PAC	IB IL 24 PWR IN/2-F-D-PAC
Inline data jumper	
24 V DC 19.2 V ... 30 V (including all tolerances, including ripple)	
6 A	4 A
-	7.5 V DC
-	
-	25 mA
-	
-	
24 V DC	
6 A	4 A
SI 5 x 20 6, 300 AT (in scope of delivery)	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 Polarity protection, surge protection	
59 g	44 g
12.2 mm / 119.8 mm / 71.5 mm Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 PWR IN/2-F-PAC	**2862136**	1
IB IL 24 PWR IN/2-F-XC-PAC	**2701162**	1
IB IL 24 PWR IN/2-F-D-PAC	**2862152**	1
IB IL 24 PWR IN/2F-DF-PAC	**2863779**	1

Accessories

Technical data

Inline data jumper	
120 V AC 108 V AC ... 135 V AC (including all tolerances, including ripple)	
8 A	
-	
-	
-	
-	
-	
-	
-	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 Surge protection	
80 g	
36.6 mm / 119.8 mm / 71.5 mm Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 120 PWR IN-PAC	**2861454**	1

Accessories

IB IL DOR LV-SET-PAC	**2861645**	1

Technical data

IB IL 230 PWR IN-PAC	IB IL 230 PWR IN/F-D-PAC
Inline data jumper	
230 V AC	
207 V AC ... 253 V AC (including all tolerances, including ripple)	-
8 A	
-	7.5 V DC
-	
-	25 mA
-	
-	
-	
-	
-	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Surge protection	-
80 g	
36.6 mm / 119.8 mm / 71.5 mm Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 230 PWR IN-PAC	**2861535**	1
IB IL 230 PWR IN/F-D-PAC	**2878971**	1

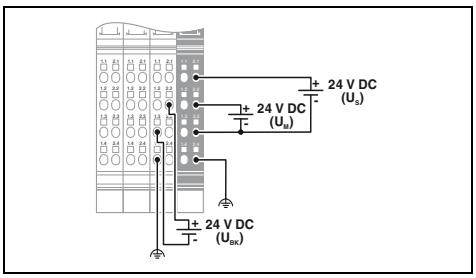
Accessories

IB IL DOR LV-SET-PAC	**2861645**	1

Boost terminal

The IB IL 24 PWR IN/R-PAC Inline boost terminal is used to boost the following voltages:
– Main circuit (U_M) up to 8 A
– Segment circuit (U_S) for the I/O supply up to 8 A
– Analog supply (U_{ANA}) up to 0.5 A
– Communications power (U_L) up to 2 A

Boost for U_M, U_S, U_L, U_{ANA}



Technical data

Local bus interface		
Connection method		Inline data jumper
Power supply for module electronics		
Main circuit supply U_M		24 V DC
Supply voltage range U_M		19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Power supply at U_M		8 A
Communications power U_L		7.5 V DC
Power supply at U_L		max. 2 A DC
I/O supply voltage U_{ANA}		24 V DC
Power supply at U_{ANA}		0.5 A DC
Segment circuit supply U_S		24 V DC
Supply voltage range U_S		19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Power supply at U_S		8 A DC
Fuse		electrical/thermal overload protection, included in scope of delivery
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Protective circuit		Surge protection (segment supply, main supply, 24 V supply) Input protective diodes (can be destroyed by permanent overload)Pulse loads up to 1500 W are short circuited by the input protective diode.
Weight		192 g
Dimensions	W / H / D	48.8 mm / 119.8 mm / 71.5 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline power terminal or **boost terminal**, complete with accessories (connector and marking field)			
	IB IL 24 PWR IN/R-PAC	2861674	1
- For extended temperature range of -40°C ... +70°C	**IB IL 24 PWR IN/R-XC-PAC**	2701298	1

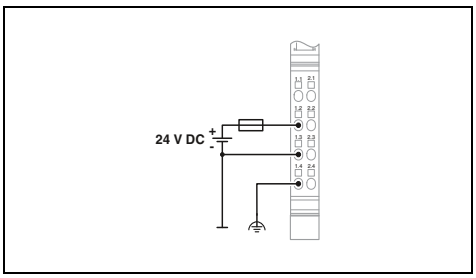
Accessories

Plug set, for power terminal, color-coded	**IB IL PWR IN/R-PLSET**	2860620	1

Boost terminal

The IB IL 24 PWR IN/R/L-0.8A-PAC Inline boost terminal is used to boost the following voltage:
– Communications power (U_L) up to 0.8 A

Boost for U_L



Technical data

Local bus interface		
Connection method		Inline data jumper
Power supply for module electronics		
Communications power U_L		7.5 V DC
Power supply at U_L		max. 0.8 A DC
Fuse		electrical/thermal overload protection, included in scope of delivery
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Protective circuit		Surge protection Input protective diodes (can be destroyed by permanent overload)Pulse loads up to 1500 W are short circuited by the input protective diode.
Weight		65 g
Dimensions	W / H / D	12.2 mm / 119.8 mm / 71.5 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline boost terminal, complete with accessories (connector and marking field) - For the communications power U_L of 0.8 A	**IB IL 24 PWR IN/R/L-0.8A-PAC**	2693020	1

Accessories

Connector for power and segment terminals	**IB IL SCN-PWR IN-CP**	2727637	10

Segment terminals

Inline segment terminals can be used to create several segment circuits (U_S) within the main circuit (U_M). The signal and initiator voltages for digital I/Os are always tapped from the segment circuit U_S.

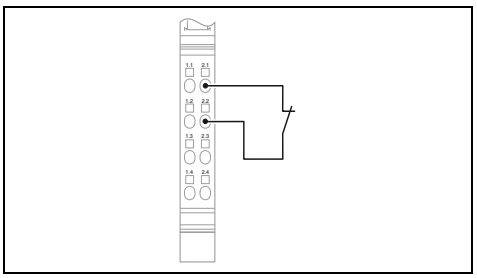
Depending on the terminal type, various functions can be implemented:

– Segmentation without fuse
– Segmentation with fine fuse
– Segmentation with fine fuse and diagnostics
– Segmentation with electronic fuse and diagnostics

When combined with the IB IL PD 24V-PAC potential distributor terminal, 24 V supplies with electronic fuse protection and remote diagnostics can be provided in the field, for example. However, the potential distributor terminals are also suitable for the economical return wiring of sensor and actuator cables when using digital Inline terminals with single-wire connection method.

24 V DC segment circuit supply U_S

Ex:



Technical data

Local bus interface		
Connection method		Inline data jumper
Power supply for module electronics		
Communications power U_L		-
Current consumption from U_L		-
Segment circuit supply U_S		24 V DC
Supply voltage range U_S		19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Power supply at U_S		8 A
Fuse		-
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Protective circuit		Overload protection fuse
Weight		42 g
Dimensions	W / H / D	12.2 mm / 119.8 mm / 71.5 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline segment terminal, complete with accessories (connector and marking field) - With fuse - With fuse and diagnostics - For extended temperature range of -40°C ... +70°C	**IB IL 24 SEG-PAC**	2861344	1
Inline potential distributor terminal, complete with accessories (connector and marking field) - 24 V - GND			

MUX

24 V DC segment circuit supply U_S, with fuse and diagnostics

24 V DC segment circuit supply U_S, with electronic fuse

Potential distributor

Ex:

U_M and U_S connected internally via fuse

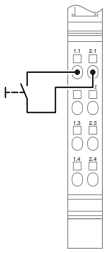
Technical data

Inline data jumper	
-	
-	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
6 A	
SI 5 x 20 6, 300 AT (in scope of delivery)	
Spring-cage connection	
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Overload protection fuse	
59 g	
12.2 mm / 119.8 mm / 71.5 mm	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 SEG/F-PAC	**2861373**	1
IB IL 24 SEG/F-D-PAC	**2861904**	1
IB IL 24 SEG/F-XC-PAC	**2701163**	1

Ex:



U_M and U_S connected internally via fuse

Button for resetting the fuse

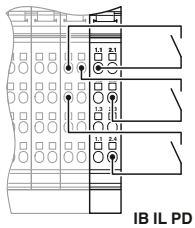
Technical data

Inline data jumper	
7.5 V DC	
30 mA	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
2.5 A	
2.5 A (electronic)	
Spring-cage connection	
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Overload protection	
44 g	
12.2 mm / 119.8 mm / 71.5 mm	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 SEG-ELF-PAC	**2861409**	1

DNV GL



e.g. for single wire connection with IB IL 24 DI 32/HD

IB IL PD 24V-PAC

Technical data

	IB IL PD 24V-PAC	IB IL PD GND-PAC
Inline data jumper		
-		
-		
24 V DC	24 V DC	-
-		
-		
-		
Spring-cage connection		
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16		
-		
44 g		
12.2 mm / 119.8 mm / 71.5 mm		
Class A product, see page 525		

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL PD 24V-PAC	**2862987**	1
IB IL PD GND-PAC	**2862990**	1

Inline ECO

The Inline ECO terminals allow you to solve automation tasks easily and cost-effectively.

Following the principle of "one terminal, one function", you will always find the right function for your automation application in the range of Inline ECO terminals. No special terminal parameterization is required.

Inline ECO terminals are approved for the temperature range from 0°C to +55°C. The electronics base and Inline plug are supplied as standard.

Find out more with the web code

Detailed information on these products can be found on our website. Simply enter # and numbers in the search field.

#1242

Can be freely combined

The Inline ECO terminals can be combined with all Inline terminals and Inline components.

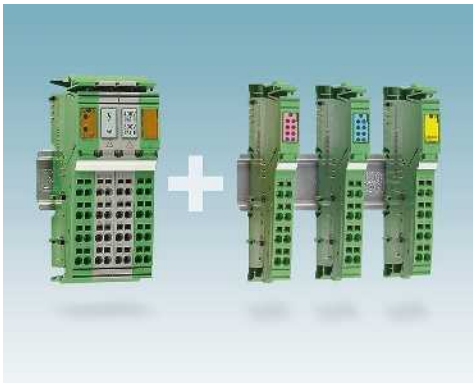
No parameterization required

Every Inline ECO terminal is particularly easy to handle. You don't need to preset any parameters.

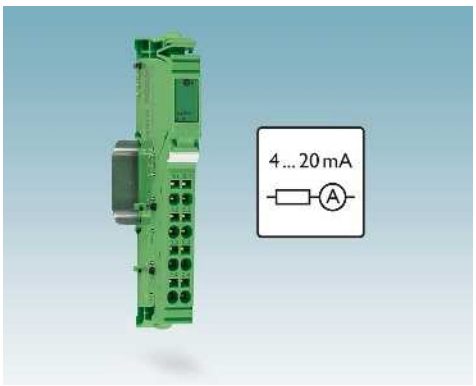
Functional safety in compact machines

Integrate the safe I/O terminal by simply plugging it into your Inline I/O station. Digital output terminals with approval for the safety-related segment circuit are then installed to the right of the safe I/O terminal.

When a sensor is activated, e.g., emergency stop, the actuator voltage supply for the connected output modules is shut down for safety reasons. Two dual-channel sensor circuits can be connected to one safe I/O terminal. All status and error messages are forwarded to the standard controller.



Can be freely combined



No parameterization required

Easy integration of network security solutions

Inline ECO – Digital input and output terminals

The ECO digital input and output terminals are designed for use within an Inline station. They are used to acquire and output digital signals.

The IB IL 24 DO4/EF-ECO output terminal is approved for applications with a safety-relevant segment circuit.

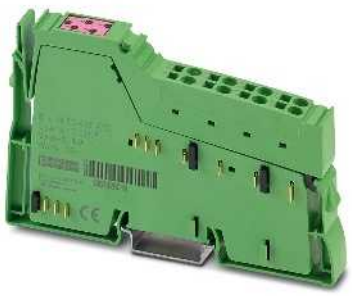
Notes:

You can find an overview of the standard versions of all digital input and output terminals from page 146

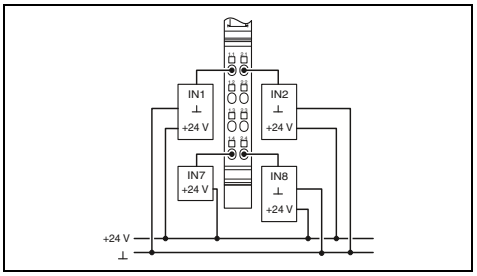
new

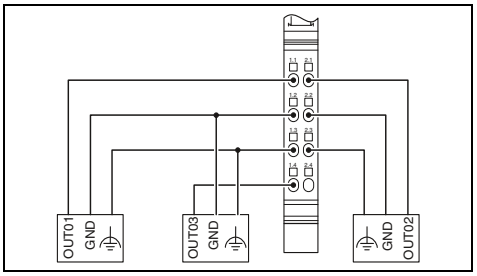
8 digital inputs

new



4/8 digital outputs





Technical data

		IB IL 24 DO 4/EF-ECO	IB IL 24 DO 8/HD-ECO
Local bus interface			
Connection method		Inline data jumper	
Power supply for module electronics			
Communications power U_L		7.5 V DC	
Current consumption from U_L		max. 30 mA DC	max. 44 mA / max. 45 mA
Digital inputs			
Connection method		1-wire	-
Number of inputs		8	-
Description of the inputs		EN 61131-2 types 1 and 3	-
Typical response time		1 ms	-
Digital outputs			
Connection method		-	3-wire / 1-wire
Number of outputs		-	4 / 8
Maximum output current per channel		-	500 mA
General data			
Connection method		Spring-cage connection	
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Weight		60 g	
Dimensions	W / H / D	12.2 mm / 119.8 mm / 71.5 mm	
Ambient temperature (operation)		0 °C ... 55 °C	
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline ECO digital input terminal (with connector)			
- Single-wire connection method	**IB IL 24 DI 8/HD-ECO**	2702792	1
Inline ECO digital output terminal (with connector)			
- For the safety-relevant segment circuit	**IB IL 24 DO 4/EF-ECO**	2702825	1
- Single-wire connection method	**IB IL 24 DO 8/HD-ECO**	2702793	1

Inline ECO
Analog input and output modules

The ECO analog input and output terminals are designed for use within an Inline station. They are used to acquire and output analog current and voltage signals.

Notes:

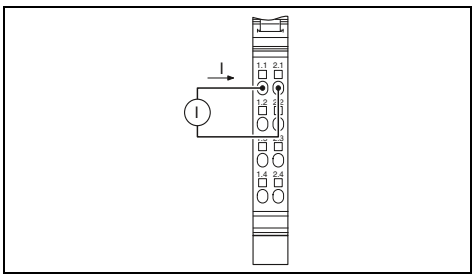
You can find an overview of the standard versions of all analog input and output terminals from page 158

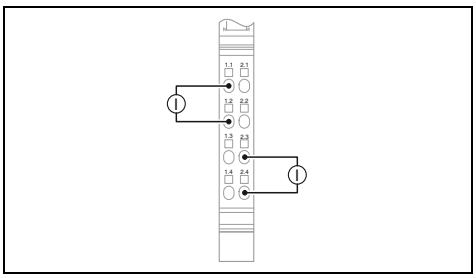
new

4 analog inputs

new

4 analog outputs





Technical data

		IB IL AI 4/I/4-20-ECO	IB IL AI 4/U/0-10-ECO
Local bus interface			
Connection method		Inline data jumper	
Power supply for module electronics			
I/O supply voltage U_{ANA}		24 V DC	
Current consumption from U_{ANA}		typ. 15 mA	
Communications power U_L		7.5 V DC	
Current consumption from U_L		typ. 60 mA	
Analog inputs			
Connection method		2-wire	
Number of inputs		4	
Voltage input signal		-	0 V ... 10 V
Current input signal		4 mA ... 20 mA	-
Measured value resolution		-	
Process data update		< 10 ms	
Data formats		Standardized representation	
Analog outputs			
Connection method		-	
Number of outputs		-	
Voltage output signal		-	
Load/output load voltage output		-	
Current output signal		-	
Load/output load current output		-	
Protective circuit		-	
Representation of output values		-	
Process data update		-	
Data formats		-	
General data			
Connection method		Spring-cage connection	
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Weight		60 g	
Dimensions	W / H / D	12.2 mm / 119.8 mm / 71.5 mm	
Ambient temperature (operation)		0 °C ... 55 °C	
EMC note		Class A product, see page 525	

Technical data

		IB IL AO 4/I/4-20-ECO	IB IL AO 4/U/0-10-ECO
Local bus interface			
Connection method		Inline data jumper	
Power supply for module electronics			
I/O supply voltage U_{ANA}		24 V DC	
Current consumption from U_{ANA}		typ. 65 mA	typ. 35 mA
Communications power U_L		7.5 V DC	
Current consumption from U_L		typ. 40 mA	typ. 60 mA
Analog inputs			
Connection method		-	
Number of inputs		-	
Voltage input signal		-	
Current input signal		-	
Measured value resolution		-	
Process data update		-	
Data formats		-	
Analog outputs			
Connection method		2-wire	
Number of outputs		4	
Voltage output signal		-	0 V ... 10 V
Load/output load voltage output		-	> 2 kΩ
Current output signal		4 mA ... 20 mA	-
Load/output load current output		< 300 Ω	-
Protective circuit		Short-circuit and overload protection Transient protection	
Representation of output values		16 bits	
Process data update		< 10 ms	
Data formats		Standardized representation	
General data			
Connection method		Spring-cage connection	
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Weight		60 g	
Dimensions	W / H / D	12.2 mm / 119.8 mm / 71.5 mm	
Ambient temperature (operation)		0 °C ... 55 °C (see "Derating" table in the data sheet)	
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline ECO analog input terminal (with connector)			
- 4 mA ... 20 mA input signal	**IB IL AI 4/I/4-20-ECO**	2702495	1
- 0 V ... 10 V input signal	**IB IL AI 4/U/0-10-ECO**	2702496	1
Inline ECO analog output terminal (with connector)			
- 4 mA ... 20 mA output signal	**IB IL AO 4/I/4-20-ECO**	2702497	1
- 0 V ... 10 V output signal	**IB IL AO 4/U/0-10-ECO**	2702498	1

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL AO 4/I/4-20-ECO	2702497	1
IB IL AO 4/U/0-10-ECO	2702498	1

Inline ECO – Temperature measurement terminals

The ECO temperature measurement terminals are designed for use within an Inline station. They are used to connect resistive temperature sensors (Pt 100 and Pt 1000) or thermocouples (types J, K, L).

Notes:

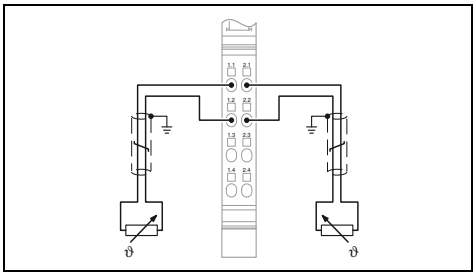
You can find an overview of the standard versions of all temperature measurement terminals from page 164

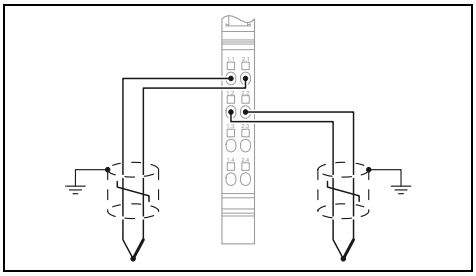
new

4 RTD inputs

new

4 UTH inputs





	Technical data		Technical data
	IB IL RTD 4/PT100-ECO	IB IL RTD 4/PT1000-ECO	
Local bus interface			
Connection method	Inline data jumper		Inline data jumper
Power supply for module electronics			
I/O supply voltage U_{ANA}	24 V DC		24 V DC
Current consumption from U_{ANA}	typ. 7.3 mA		typ. 32 mA
Communications power U_L	7.5 V DC		7.5 V DC
Current consumption from U_L	typ. 56 mA		typ. 38 mA
Analog inputs			
Connection method	2-wire		2-wire
Number of inputs	4 (Pt 100)	4 (Pt 1000)	4 (type J)
Precision	-		typ. ± 1.9 K (cold junction)
Description of the input	Input for resistive temperature sensors		Differential inputs
Linear resistance measuring range	-		-
Sensor types (RTD) that can be used	Pt 100 (IEC 60751/EN 60751)	Pt 1000 (IEC 60751/EN 60751)	-
Measuring principle	-		Sigma/Delta process
Process data update	< 10 ms		< 10 ms
General data			
Connection method	Spring-cage connection		Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	60 g		65 g
Dimensions W / H / D	12.2 mm / 119.8 mm / 71.5 mm		12.2 mm / 119.8 mm / 71.5 mm
EMC note	Class A product, see page 525		Class A product, see page 525

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Inline ECO analog input terminal (with connector)						
- For Pt 100 resistance temperature detectors	**IB IL RTD 4/PT100-ECO**	2702499	1			
- For Pt 1000 resistance temperature detectors	**IB IL RTD 4/PT1000-ECO**	2702501	1			
Inline ECO analog input terminal (with connector)						
- For thermocouple type J according to DIN EN 60584-1				**IB IL UTH 4/J-ECO**	2702502	1
- For thermocouple type K according to DIN EN 60584-1				**IB IL UTH 4/K-ECO**	2702503	1
- For thermocouple type L according to DIN 43710				**IB IL UTH 4/L-ECO**	2702504	1

Inline ECO – Serial communication terminals

The ECO serial communication terminals are designed for use within an Inline station.

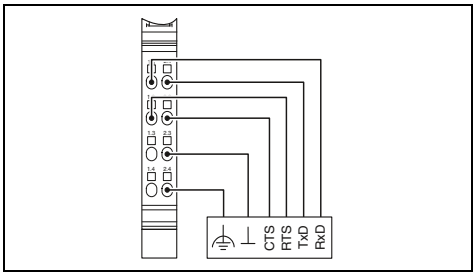
The IB IL RS 232-ECO terminal is used to operate standard I/O devices with serial RS-232 interfaces on a bus system.

Notes:

You can find an overview of the standard versions of all serial communication terminals from page 172

new

1 serial RS-232 interface



Technical data

Local bus interface		
Connection method		Inline data jumper
Serial port		
Interface		RS-232
Connection method		Spring-cage connection
Power supply for module electronics		
Communications power U_L		7.5 V
Current consumption from U_L		typ. 70 mA
Serial input/output channel		
Input buffer		4 kbyte
Output buffer		1 kbyte
Transmission speed		110 bps ... 38400 bps (configurable)
Data bits		6 ... 8
Stop bits		1 or 2
Parity		Even, odd or no parity
Transmission type		Transparent mode
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		60 g
Dimensions	W / H / D	12.2 mm / 119.8 mm / 71.5 mm
Ambient temperature (operation)		0 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline ECO communication terminal (with connector)			
	IB IL RS 232-ECO	2702795	1

Inline ECO – Serial communication terminals

The ECO serial communication terminals are designed for use within an Inline station.

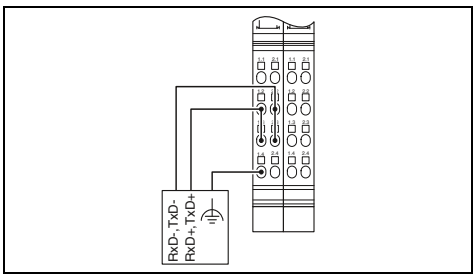
The IB IL RS 485-ECO terminal is used to operate standard I/O devices with serial RS-485 interfaces on a bus system.

Notes:

You can find an overview of the standard versions of all serial communication terminals from page 172

new

1 serial RS-485 interface



Technical data

Local bus interface		
Connection method		Inline data jumper
Serial port		
Interface		RS-485
Connection method		Spring-cage connection
Power supply for module electronics		
Communications power U_L		7.5 V
Current consumption from U_L		typ. 70 mA
Serial input/output channel		
Input buffer		4 kbyte
Output buffer		1 kbyte
Transmission speed		110 bps ... 38400 bps (configurable)
Data bits		6 ... 8
Stop bits		1 or 2
Parity		Even, odd or no parity
Transmission type		Transparent mode
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		62 g
Dimensions	W / H / D	12.2 mm / 119.8 mm / 71.5 mm
Ambient temperature (operation)		0 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline ECO communication terminal (with connector)			
	IB IL RS 485-ECO	2702141	1

Digital input terminals

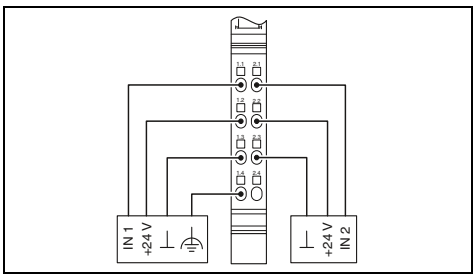
Digital Inline input terminals are designed to connect digital signals, such as those supplied by buttons, limit switches or proximity switches.

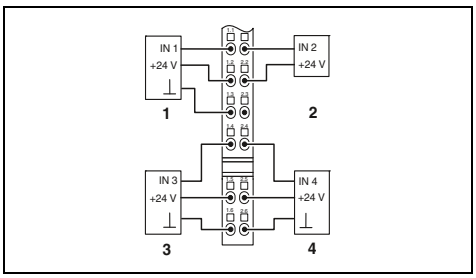
Features, depending on the selected device:

– 2 to 32-channel
– According to EN 61131-2 Type 1 or 3
– Single, 2, 3 or 4-wire connection method
– Maximum permissible load current per sensor: 250 mA

2 inputs

4 inputs





Technical data

		IB IL 24 DI 4-PAC	IB IL 24 DI 4-ME
Local bus interface			
Connection method	Inline data jumper	Inline data jumper	
Power supply for module electronics			
Communications power U_L	7.5 V DC	7.5 V DC	
Current consumption from U_L	max. 35 mA	max. 40 mA	
Digital inputs			
Connection method	4-wire	3-wire	
Number of inputs	2	4	
Description of the inputs	EN 61131-2 type 1	EN 61131-2 type 1	IEC 61131-2 type 1
Typical response time	< 1 ms	< 1 ms	
General data			
Connection method	Spring-cage connection	Spring-cage connection	
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Weight	53 g	66 g	59 g
Dimensions W / H / D	12.2 mm / 119.8 mm / 71.5 mm	12.2 mm / 140.5 mm / 71.5 mm	12.2 mm / 119.8 mm / 71.5 mm
EMC note	Class A product, see page 525	Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline digital input terminal, complete with accessories (connector and marking field)			
	IB IL 24 DI 2-PAC	2861221	1
- Single-wire connection method - Machine Edition (ME version) - For extended temperature range of -40°C ... +70°C			

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 DI 4-PAC	2861234	1
IB IL 24 DI 4-ME	2863928	4
IB IL 24 DI 4-XC-PAC	2701152	1

Accessories

Description	Type	Order No.	Pcs./Pkt.
Plug set			
Plug set for IB IL DI 16, color-coded			
Inline plug	**IB IL SCN-8-CP**	2727608	10

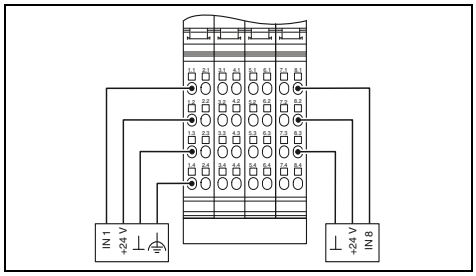
Accessories

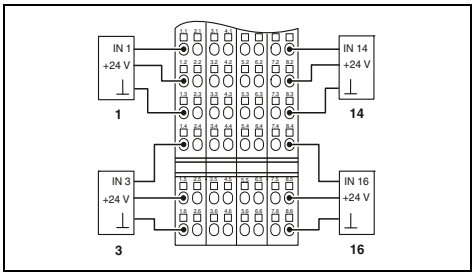
Type	Order No.	Pcs./Pkt.
IB IL SCN-12-ICP	2727611	10

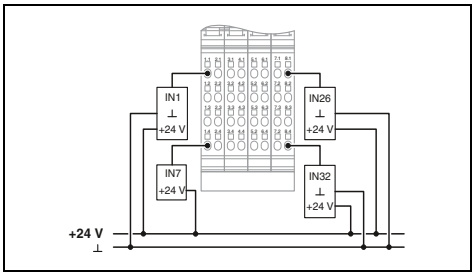
8 inputs

16 inputs

32 inputs







Technical data

IB IL 24 DI 8-PAC	IB IL 24 DI8/HD-PAC
Inline data jumper	
7.5 V DC	
max. 50 mA	max. 30 mA DC
4-wire	1-wire
8	
EN 61131-2 type 1	EN 61131-2 types 1 and 3
< 1 ms	1 ms
Spring-cage connection	
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
118 g	60 g
48.8 mm / 119.8 mm / 71.5 mm	12.2 mm / 119.8 mm / 71.5 mm
Class A product, see page 525	

Technical data

IB IL 24 DI 16-PAC	IB IL 24 DI 16-ME
Inline data jumper	
7.5 V DC	
max. 60 mA	
3-wire	
16	
EN 61131-2 type 1	IEC 61131-2 type 1
< 1 ms	
Spring-cage connection	
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
210 g	122 g
48.8 mm / 140.5 mm / 71.5 mm	48.8 mm / 119.8 mm / 71.5 mm
Class A product, see page 525	

Technical data

Inline data jumper
7.5 V DC
max. 90 mA
1-wire
32
EN 61131-2 type 1
2 ms
Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
185 g
48.8 mm / 119.8 mm / 71.5 mm
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 DI 8-PAC	2861247	1
IB IL 24 DI8/HD-PAC	2700173	1
IB IL 24 DI8/HD-XC-PAC	2701212	1

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 DI 16-PAC	2861250	1
IB IL 24 DI 16-ME	2897156	4
IB IL 24 DI 16-XC-PAC	2701154	1

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 DI 32/HD-PAC	2862835	1

Accessories

IB IL SCN-8	2726337	10

Accessories

IB IL DI16-PLSET/ICP	2860989	1

Accessories

IB IL DI/DO 8-PLSET	2860950	1

Digital input terminals

The digital Inline input terminals are used to acquire digital input signals. They are designed for use within an Inline station.

NPN terminal features:
– 2 to 32-channel

T2 terminal features:
– According to EN 61131-2 Type 2

S0 terminal features:
– Connection of S0 pulse encoders
– 32-bit counter range

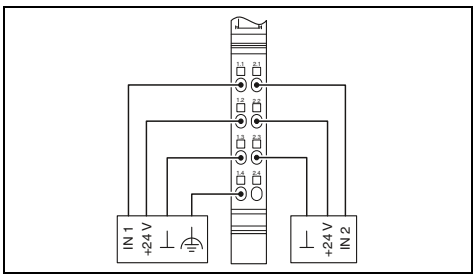
Pulse counter:
– Maximum counting frequency of up to 150 Hz

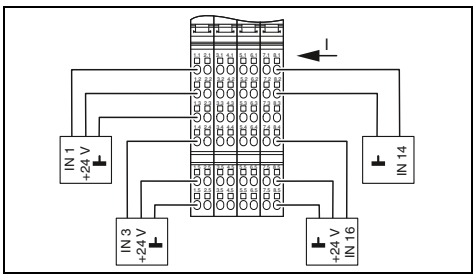
Operating hours counter:
– 1 s resolution
– Counter enabled on active or inactive input (configurable)

2 inputs, NPN-wired

16 inputs, NPN-wired

Ex:





Technical data

Local bus interface			
Connection method		Inline data jumper	Inline data jumper
Power supply for module electronics			
Communications power U_L		7.5 V DC	7.5 V DC
Current consumption from U_L		max. 35 mA	max. 60 mA
Digital inputs			
Connection method		4-wire	3-wire
Number of inputs		2 (NPN)	16 (NPN)
Description of the inputs		EN 61131-2 type 1	EN 61131-2 type 1
Typical response time		< 1 ms	< 1 ms
General data			
Connection method		Spring-cage connection	Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		53 g	210 g
Dimensions	W / H / D	12.2 mm / 119.8 mm / 71.5 mm	48.8 mm / 140.5 mm / 71.5 mm
EMC note		Class A product, see page 525	Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline digital input terminal, complete with accessories (connector and marking field) - NPN-wired - Input in acc. with EN 61131-2/Type 2 - S0 counter	**IB IL 24 DI 2-NPN-PAC**	2861483	1

Accessories

Plug set			
Inline plug	**IB IL SCN-8-CP**	2727608	10

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline digital input terminal, complete with accessories (connector and marking field) - NPN-wired - Input in acc. with EN 61131-2/Type 2 - S0 counter	**IB IL 24 DI 16-NPN-PAC**	2863520	1

Accessories

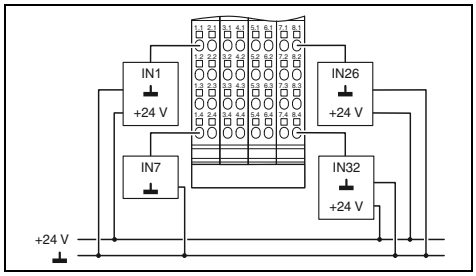
Plug set			
Inline plug	**IB IL SCN-12-ICP**	2727611	10

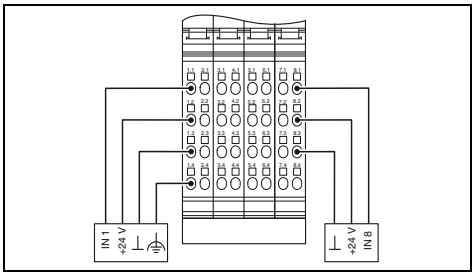
32 inputs, NPN-wired

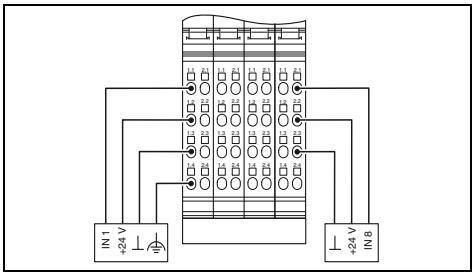
8 inputs, EN 61131-2/Type 2

8 S_0 counter inputs

Ex:







Technical data

Inline data jumper

7.5 V DC
max. 90 mA

1-wire
32 (NPN)
-
< 1 ms

Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
185 g
48.8 mm / 119.8 mm / 71.5 mm
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 DI 32/HD-NPN-PAC	2878243	1

Accessories

IB IL DI/DO 8-PLSET	2860950	1

Technical data

Inline data jumper

7.5 V DC
max. 50 mA

4-wire
8
IEC 61131-2 Type 2
< 1 ms

Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
118 g
48.8 mm / 119.8 mm / 71.5 mm
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 DI 8/T2-PAC	2862204	1

Accessories

IB IL SCN-8-CP	2727608	10

Technical data

Inline data jumper

7.5 V DC
max. 55 mA

4-wire
8 (S0 counter inputs)
IEC 62053-31 and DIN 43864
-

Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
183 g
48.8 mm / 119.8 mm / 71.5 mm
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL DI 8/S0-PAC	2897020	1

Accessories

IB IL SCN-8-CP	2727608	10

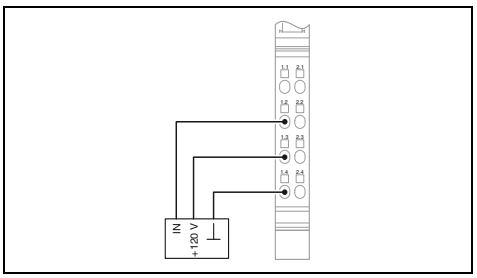
Digital input terminals

The terminals are designed for use within an Inline station. They are used to acquire digital input signals in the 120 V AC or 230 V AC voltage range.

Features:

– Connections for one digital sensor
– Maximum permissible load current: 500 mA

1 input, 120 V



Technical data

Local bus interface		
Connection method		Inline data jumper
Power supply for module electronics		
Supply voltage		120 V AC
Supply voltage range		108 V AC ... 135 V AC
Communications power U_L		7.5 V
Current consumption from U_L		max. 30 mA
Digital inputs		
Connection method		3-wire
Number of inputs		1
Description of the inputs		IEC 61131-2 type 1
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		39 g
Dimensions	W / H / D	12.2 mm / 119.8 mm / 71.5 mm
EMC note		Class A product, see page 525

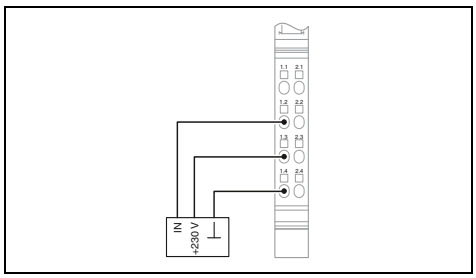
Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline digital input terminal, complete with accessories (connector and marking field) - 120 V AC - 230 V AC	**IB IL 120 DI 1-PAC**	2861917	1

Accessories

Inline distance terminal	**IB IL DOR LV-SET-PAC**	2861645	1

1 input, 230 V



Technical data

Inline data jumper
230 V AC 12 V AC ... 253 V AC 7.5 V max. 30 mA
3-wire 1 IEC 61131-2 type 1
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 39 g 12.2 mm / 119.8 mm / 71.5 mm Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 230 DI 1-PAC	2861548	1

Accessories

IB IL DOR LV-SET-PAC	2861645	1

Digital output terminals

Digital Inline output terminal blocks are designed for the connection of digital actuators, such as electromagnetic valves, contactors or visual indicators.

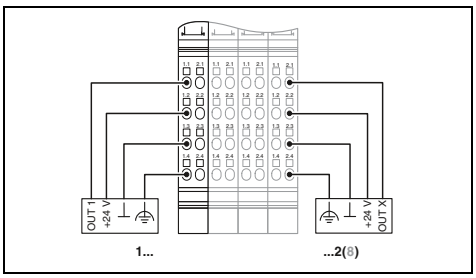
Features, depending on the selected device:

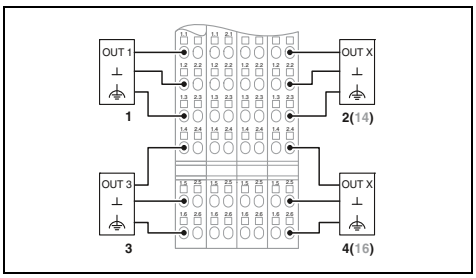
– 2 to 32-channel
– Connection of actuators in single, 2, 3, and 4-wire technology
– Nominal current per output: 500 mA
– Short-circuit and overload protected outputs

2 outputs

4 outputs

Ex:





Technical data

		IB IL 24 DO 2-PAC	
Local bus interface			
Connection method		Inline data jumper	
Power supply for module electronics			
Communications power U_L		7.5 V DC	
Current consumption from U_L		max. 33 mA	
Digital outputs			
Connection method		4-wire	
Number of outputs		2	
Maximum output current per channel		500 mA	
Protective circuit		Overload protection, short-circuit protection of outputs	
General data			
Connection method		Spring-cage connection	
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Weight		41 g	
Dimensions	W / H / D	12.2 mm / 119.8 mm / 71.5 mm	
EMC note		Class A product, see page 525	

Technical data

		IB IL 24 DO 4-PAC	IB IL 24 DO 4-ME
Local bus interface			
Connection method		Inline data jumper	
Power supply for module electronics			
Communications power U_L		7.5 V DC	
Current consumption from U_L		max. 44 mA	
Digital outputs			
Connection method		3-wire	
Number of outputs		4	
Maximum output current per channel		500 mA	
Protective circuit		Overload protection, short-circuit protection of outputs	
General data			
Connection method		Spring-cage connection	
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Weight		66 g	59 g
Dimensions	W / H / D	12.2 mm / 140.5 mm / 71.5 mm	12.2 mm / 119.8 mm / 71.5 mm
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline digital output terminal, complete with accessories (connector and marking field)			
	IB IL 24 DO 2-PAC	2861470	1
- Single-wire connection method - Machine Edition (ME version) - For extended temperature range of -40°C ... +70°C			

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 DO 4-PAC	2861276	1
IB IL 24 DO 4-ME	2863931	4
IB IL 24 DO 4-XC-PAC	2701155	1

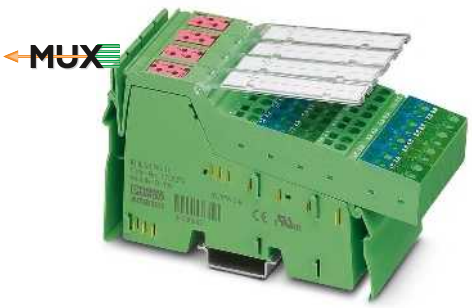
Accessories

Plug set for IB IL DO 16, color-coded			
Inline plug	**IB IL SCN-8-CP**	2727608	10

Accessories

Inline plug	**IB IL SCN-12-OCP**	2727624	10

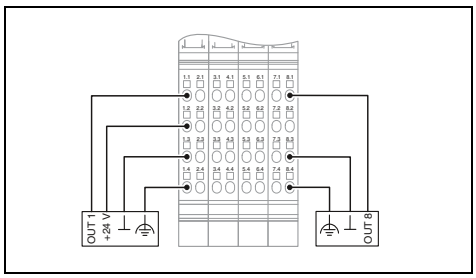
8 outputs

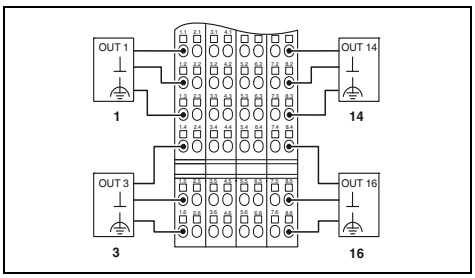


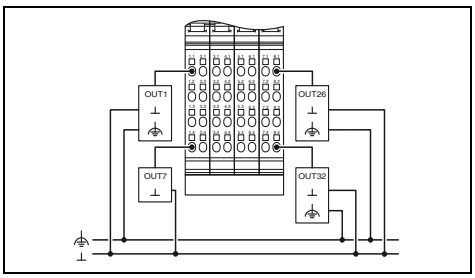
16 outputs

32 outputs

Ex:







Technical data

IB IL 24 DO 8-PAC	IB IL 24 DO8/HD-PAC
Inline data jumper	
7.5 V DC	
max. 60 mA	max. 45 mA
4-wire	1-wire
8	
500 mA	
Overload protection, short-circuit protection of outputs	
Spring-cage connection	
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
130 g	60 g
48.8 mm / 119.8 mm / 71.5 mm	12.2 mm / 119.8 mm / 71.5 mm
Class A product, see page 525	

Technical data

IB IL 24 DO 16-PAC	IB IL 24 DO 16-ME
Inline data jumper	
7.5 V DC	
max. 90 mA	
3-wire	
16	
500 mA	
Overload protection, short-circuit protection of outputs	
Spring-cage connection	
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
218 g	190 g
48.8 mm / 140.5 mm / 71.5 mm	48.8 mm / 119.8 mm / 71.5 mm
Class A product, see page 525	

Technical data

Inline data jumper
7.5 V DC
max. 140 mA
1-wire
32
500 mA
Overload protection, short-circuit protection of outputs
Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
195 g
48.8 mm / 119.8 mm / 71.5 mm
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 DO 8-PAC	**2861289**	1
IB IL 24 DO8/HD-PAC	**2700172**	1
IB IL 24 DO8/HD-XC-PAC	**2701213**	1

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 DO 16-PAC	**2861292**	1
IB IL 24 DO 16-ME	**2897253**	4
IB IL 24 DO 16-XC-PAC	**2701156**	1

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 DO 32/HD-PAC	**2862822**	1

Accessories

IB IL SCN-8	**2726337**	10

Accessories

IB IL DO16-PLSET/OCP	**2860992**	1

Accessories

IB IL DI/DO 8-PLSET	**2860950**	1

Digital output terminals

The terminals are designed for use within an Inline station. They are used to output digital signals.

NPN terminal features:
- NPN-wired
- 2 to 32-channel
- Connection of sensors in single, 2, 3, and 4-wire technology
- Maximum permissible load current per actuator: 500 mA
- Short-circuit and overload protected outputs

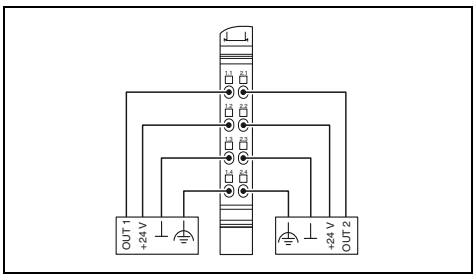
2 A module features:
- 2 to 8-channel
- Connection of sensors in 2, 3, and 4-wire technology
- Maximum permissible load current per actuator: 2 A
- Short-circuit and overload protected outputs

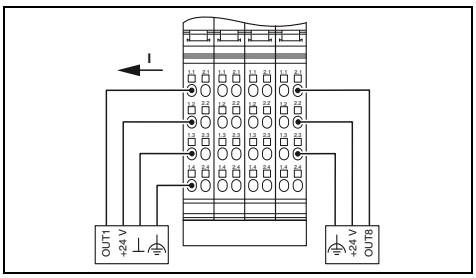
2 outputs, NPN-wired

8 outputs, NPN-wired

Ex:

Ex:





Technical data

Local bus interface			
Connection method		Inline data jumper	Inline data jumper
Power supply for module electronics			
Communications power U_L		7.5 V DC	7.5 V DC
Current consumption from U_L		max. 32 mA	max. 60 mA
Digital outputs			
Connection method		4-wire	4-wire
Number of outputs		2 (NPN)	8 (NPN)
Maximum output current per channel		500 mA	1 A
Protective circuit		Overload protection, short-circuit protection of outputs	Overload protection, short-circuit protection of outputs
General data			
Connection method		Spring-cage connection	Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		42 g	130 g
Dimensions	W / H / D	12.2 mm / 119.8 mm / 71.5 mm	48.8 mm / 119.5 mm / 71.5 mm
EMC note		Class A product, see page 525	Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline digital output terminal, complete with accessories (connector and marking field) - NPN-wired - Outputs 2 A - For extended temperature range of -40°C ... +70°C	**IB IL 24 DO 2-NPN-PAC**	2861496	1

Accessories

Plug set			
Inline plug	**IB IL SCN-8-CP**	2727608	10

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 DO 8-NPN-PAC	2863546	1

Accessories

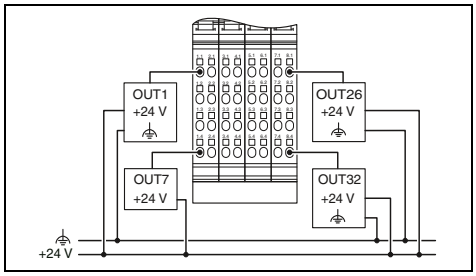
IB IL SCN-8-CP	2727608	10

32 outputs, NPN-wired

2 outputs, 2 A

8 outputs, 2 A

Ex:



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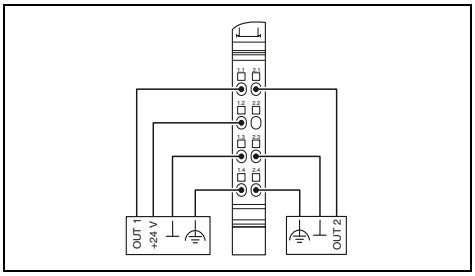
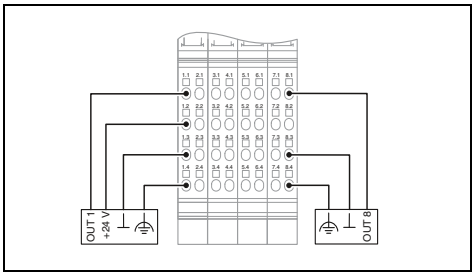




Technical data

Inline data jumper	
7.5 V DC max. 140 mA	
1-wire 32 (NPN) 500 mA Overload protection, short-circuit protection of outputs	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 195 g 48.8 mm / 119.8 mm / 71.5 mm Class A product, see page 525	

Technical data

Inline data jumper	
7.5 V DC max. 35 mA	
4-wire 2 2 A Overload protection, short-circuit protection of outputs	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 61 g 12.2 mm / 119.8 mm / 71.5 mm Class A product, see page 525	

Technical data

Inline data jumper	
7.5 V DC max. 60 mA	
4-wire 8 2 A Overload protection, short-circuit protection of outputs	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 130 g 48.8 mm / 119.8 mm / 71.5 mm Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 DO 32/HD-NPN-PAC	2878340	1

Accessories

IB IL DI/DO 8-PLSET	2860950	1

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 DO 2-2A-PAC	2861263	1
IB IL 24 DO 2-2A-XC-PAC	2702133	1

Accessories

IB IL SCN-8-CP	2727608	10

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 DO 8-2A-PAC	2861603	1

Accessories

IB IL SCN-8-CP	2727608	10

Digital output terminals

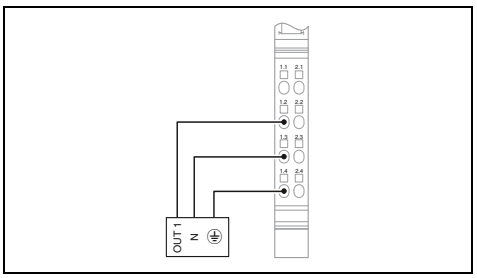
Digital Inline output terminals are designed for the connection of digital actuators, such as electromagnetic valves, contactors or visual indicators.

Inline relay terminals make it possible to switch any I/O voltage up to a maximum of 230 V AC.

Differing relay contact materials ensure low contact resistance for small loads and lamp loads in the ...W versions, while the ...W/PC versions are designed for capacitive loads.

The IB IL 24/48 DOR 2/W-PAC module is a relay module for small signals.

1/4 outputs,
12 - 253 V AC



Technical data

		IB IL DO 1 AC-PAC	IB IL DO 4 AC-1A-PAC
Local bus interface			
Connection method		Inline data jumper	
Power supply for module electronics			
Communications power U_L		7.5 V DC	
Current consumption from U_L		max. 35 mA	max. 45 mA
Digital outputs			
Connection method		3-wire	
Number of outputs		1	4
Maximum output current per channel		500 mA	1 A
General data			
Connection method		Spring-cage connection	
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Weight		45 g	130 g
Dimensions	W / H / D	12.2 mm / 119.8 mm / 71.5 mm	48.8 mm / 119.8 mm / 71.5 mm
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline digital output terminal, complete with accessories (connector and marking field)			
- 1 output	**IB IL DO 1 AC-PAC**	2861920	1
- 4 outputs 1 A	**IB IL DO 4 AC-1A-PAC**	2861658	1
- 1 SPDT relay contact			
- 2 SPDT relay contacts,			
- 4 SPDT relay contacts			
- 4 SPDT relay contacts, 10 A, high inrush current			
- For extended temperature range of -40°C ... +70°C			

Accessories

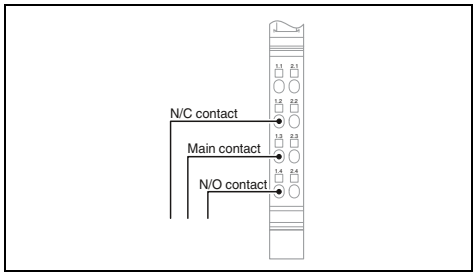
Inline distance terminal **Plug** for digital Inline terminals with AC voltage	**IB IL DOR LV-SET-PAC**	2861645	1

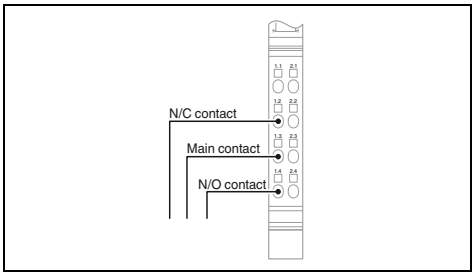
**1/4 relay outputs,
5 - 253 V AC, gold contacts**

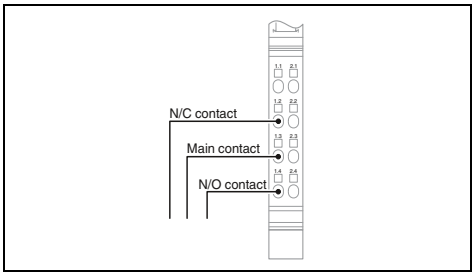
**1/4 relay outputs,
5 - 253 V AC**

**2 relay outputs,
5 - 50 V AC, 5 - 120 V DC**

Ex:







Technical data

	IB IL 24/230 DOR1/W-PAC	IB IL 24/230 DOR4/W-PAC
	Inline data jumper	
	7.5 V	
	max. 60 mA	max. 187 mA
	-	
	1 (floating contacts)	4 (floating contacts)
	3 A	
	Spring-cage connection	
	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
	46 g	138 g
	12.2 mm / 119.8 mm / 71.5 mm	48.8 mm / 119.8 mm / 71.5 mm
	Class A product, see page 525	

Technical data

	IB IL 24/230 DOR1/W-PC-PAC	IB IL 24/230 DOR4/W-PC-PAC
	Inline data jumper	Via data marshalling
	7.5 V	
	max. 60 mA	max. 187 mA
	-	
	1 (floating contacts)	4 (floating contacts)
	2.6 A	3 A
	Spring-cage connection	
	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
	46 g	138 g
	12.2 mm / 119.8 mm / 71.5 mm	48.8 mm / 119.8 mm / 71.5 mm
	Class A product, see page 525	

Technical data

Inline data jumper
7.5 V DC
max. 30 mA
-
2 (floating contacts)
2 A
Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
63 g
12.2 mm / 119.8 mm / 71.5 mm
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24/230 DOR1/W-PAC	**2861881**	1
IB IL 24/230 DOR4/W-PAC	**2861878**	1
IB IL 24/230 DOR4/HC-PAC	**2897716**	1

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24/230 DOR1/W-PC-PAC	**2862178**	1
IB IL 24/230 DOR4/W-PC-PAC	**2862181**	1

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24/48 DOR 2/W-PAC	**2863119**	1
IB IL 24/48 DOR 2/W-XC-PAC	**2701214**	1

Accessories

IB IL DOR LV-SET-PAC	**2861645**	1
IB IL SCN-8-AC-REL	**2740290**	10

Accessories

IB IL DOR LV-SET-PAC	**2861645**	1
IB IL SCN-8-AC-REL	**2740290**	10

Accessories

Analog input terminals

Inline Analog input terminals are suitable for connecting standard sensors for acquiring current and voltage signals.

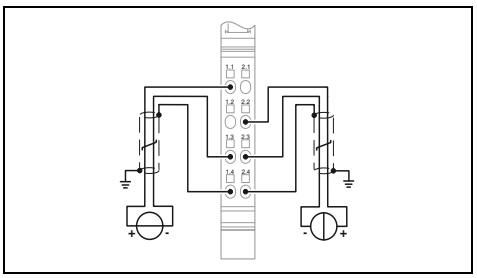
Terminals with 2, 4 or 8 channels are available.

Features:

- Single-ended and differential inputs
- Connection of sensors in 2 or 3-wire technology
- Measured value acquisition with 13 or 16-bit resolution
- High level of measuring accuracy
- Excellent interference and common mode suppression
- Overload-protected current inputs
- Integrated short-circuit-proof sensor supply

2 inputs

Ex:



Technical data

		IB IL AI 2/SF-PAC	IB IL AI 2/SF-ME
Local bus interface			
Connection method		Inline data jumper	
Power supply for module electronics			
I/O supply voltage U_{ANA}		24 V DC	
Current consumption from U_{ANA}		max. 18 mA	
Communications power U_L		7.5 V DC	
Current consumption from U_L		max. 60 mA	
Analog inputs			
Connection method		2-wire	
Number of inputs		2	
Voltage input signal		0 V ... 10 V / -10 V ... 10 V	
Current input signal		0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA	
Process data			
Measured value resolution		16 bits (15 bits + sign bit)	13 bits (12 bits + sign bit)
Process data update		< 1.5 ms	typ. 1.5 ms
Data formats		IL, IB ST, IB RT, standardized representation	
General data			
Connection method		Spring-cage connection	
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Weight		69 g	47 g
Dimensions	W / H / D	12.2 mm / 136.8 mm / 71.5 mm	12.2 mm / 119.8 mm / 71.5 mm
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline analog input terminal, complete with accessories (connector and marking field)			
	IB IL AI 2/SF-PAC	**2861302**	1
- Machine Edition (ME version) - 8 inputs, initiator with supply outputs	**IB IL AI 2/SF-ME**	**2863944**	1
- For extended temperature range of -40°C ... +70°C	**IB IL AI 2/SF-XC-PAC**	**2701157**	1

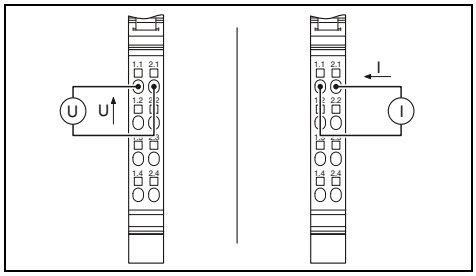
Accessories

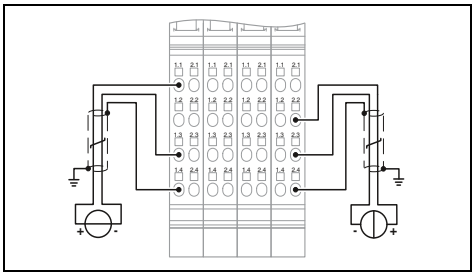
Shield plug	**IB IL SCN 6-SHIELD-TWIN**	**2740245**	5

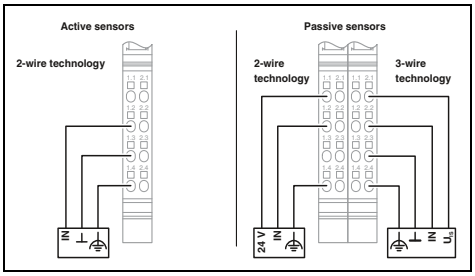
4 inputs

8 inputs

8 inputs,
with initiator supply







Technical data

IB IL AI 4/U-PAC	IB IL AI 4/I-PAC
Inline data jumper	
24 V DC typ. 30 mA 7.5 V DC	
2-wire 4 0 V ... 10 V / -10 V ... 10 V -	 - 0 mA ... 20 mA / 4 mA ... 20 mA
12 bits (11 bits + sign bit) typ. 250 µs (all channels) IB IL, S7-compatible	13 bits (12 bits + sign bit)
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 66 g 12.2 mm / 119.8 mm / 71.5 mm Class A product, see page 525	

Technical data

Inline data jumper
24 V DC max. 35 mA 7.5 V DC max. 55 mA
2-wire 8 0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V 0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
16 bits (15 bits + sign bit) bus-synchronous IL, IB ST, IB RT, standardized representation, PIO format
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 213 g 48.8 mm / 136.8 mm / 71.5 mm Class A product, see page 525

Technical data

Inline data jumper
24 V DC max. 40 mA 7.5 V DC max. 65 mA
2, 3-wire 8 - 0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
16 bits (15 bits + sign bit) bus-synchronous IBS IL, IBS ST, IBS RT, standardized representation, PIO format
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 125 g 48.8 mm / 136.8 mm / 71.5 mm Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL AI 4/U-PAC	2700459	1
IB IL AI 4/I-PAC	2700458	1

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL AI 8/SF-PAC	2861412	1
IB IL AI 8/SF-XC-PAC	2701159	1

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL AI 8/IS-PAC	2861661	1

Accessories

IB IL SCN 6-SHIELD-TWIN	2740245	5

Accessories

IB IL SCN 6-SHIELD-TWIN	2740245	5

Analog input terminals

The IB IL AI 4/EF (EF...Extended Functions) analog Inline terminal is suitable for connecting standard sensors for acquiring current and voltage signals.

Features:

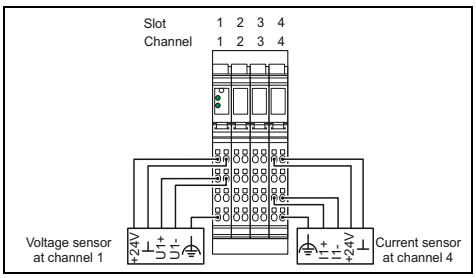
- 4 differential signal inputs
- Connection of sensors in 2, 3, and 4-wire technology
- Measured value acquisition with 16-bit resolution
- Sensor supply with channel-specific integrated short-circuit and overload protection
- Short update time of < 1 ms, maximum for all channels
- Bus-synchronous provision of input values with very low jitter (< 10 µs)

Notes:

The driver function blocks can be obtained free of charge on the Internet at phoenixcontact.net/products under Download on the product page of the corresponding module.

**4 inputs,
with extended functions**

Ex:



Technical data

Local bus interface		
Connection method		Inline data jumper
Power supply for module electronics		
I/O supply voltage U_{ANA}		24 V DC
Current consumption from U_{ANA}		max. 20 mA
Communications power U_L		7.5 V DC
Current consumption from U_L		max. 100 mA
Analog inputs		
Connection method		2, 3, 4-wire
Number of inputs		4
Description of the input		Differential input, including sensor supply (24 V DC)
Voltage input signal		0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
Current input signal		0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Process data		
Measured value resolution		16 bits (15 bits + sign bit)
Process data update		< 1 ms (bus-synchronous)
Data formats		IB IL, IB ST, standardized representation, S7 compatible
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		210 g
Dimensions	W / H / D	48.8 mm / 135 mm / 71.5 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline analog input terminal, complete with accessories (connector and marking field)			
	IB IL AI 4/EF-PAC	2878447	1
- For extended temperature range of -40°C ... +70°C	**IB IL AI 4/EF-XC-PAC**	2701215	1

Accessories

Shield plug	**IB IL SCN 6-SHIELD-TWIN**	2740245	5

Analog input terminal with HART functionality

The Inline terminal offers the option of communicating with intelligent field devices using the standardized HART communication protocol.

It enables both analog and digital communication. The analog signal transmits the process information; the digital modulated signal also permits bidirectional communication with the HART-compatible sensor.

Features:

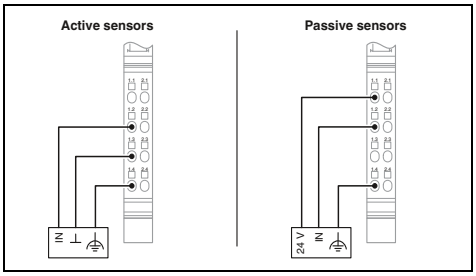
- Two differential signal inputs for current sensors
- Sensor connection with 2-wire connection method
- Measured value acquisition with 16-bit resolution
- Point-to-point and multi-drop connections possible
- Polling and burst modes
- A maximum of 5 HART devices can be connected per channel
- A hand-held operator panel can be connected
- FDT/DTM support

Notes:

The driver function blocks can be obtained free of charge on the Internet at phoenixcontact.net/products under Download on the product page of the corresponding module.

2 HART inputs

Ex:



Technical data

Local bus interface		
Connection method		Inline data jumper
Power supply for module electronics		
I/O supply voltage U_{ANA}		24 V DC
Current consumption from U_{ANA}		max. 150 mA
Communications power U_L		7.5 V DC
Current consumption from U_L		max. 110 mA
Analog inputs		
Connection method		2-wire
Number of inputs		2
Current input signal		4 mA ... 20 mA / 0 mA ... 25 mA
Process data		
Measured value resolution		16 bits (15 bits + sign bit)
Process data update		typ. 1 ms (bus-synchronous)
Data formats		IB IL, standardized representation, PIO
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		134 g
Dimensions	W / H / D	48.8 mm / 135 mm / 71.5 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline analog input terminal, complete with accessories (connector and marking field) - HART functionality	**IB IL AI 2-HART-PAC**	2862149	1

Accessories

Shield plug	**IB IL SCN 6-SHIELD-TWIN**	2740245	5

Strain gauge measurement terminals

Inline strain gauge measurement terminals enable the connection of load cells, force transducers, mass force transducers, and similar instruments, based on strain gauges.

IB IL SGI 2/F-PAC features:

– 2 fast inputs for strain gauge
– Bus-synchronous process data update with ≥ 1 ms (depending on the local bus cycle time)
– Typical deviation of the measuring range final value of ±0.1% (unipolar) or ±0.2% (bipolar)
– Optional: 16-sample mean-value generation

IB IL SGI 2/P/EF-PAC features:

– 2 high-precision and fast inputs for the strain gauges
– Typical deviation of the measuring range final value of ±0.01%
– Serial interface for external weight displays
– Zero point, tare, and standstill display
– Optional: 4, 16, and 32-sample mean-value generation

IB IL SGI 1/CAL features:

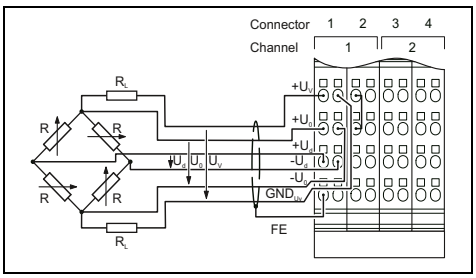
– 1 input for strain gauge
– Can be verified by EC type approval according to standards EN 45501 and OIML R76
– Electronic evaluating device to set up non-automatic weighing instruments (NAWI)
– Up to 3000 division counts
– Serial interface for external weight displays
– Zero point, tare, and standstill display
– Alibi memory for up to 65,536 measurement protocols

Notes:

The driver function blocks can be obtained free of charge on the Internet at phoenixcontact.net/products under Download on the product page of the corresponding module.

2 fast inputs

Ex:



Technical data

Local bus interface		
Connection method		Inline data jumper
Power supply for module electronics		
I/O supply voltage U_{ANA}		24 V DC
Current consumption from U_{ANA}		typ. 32 mA (with maximum load of 58.3 Ω when U_V = 5 V)
Communications power U_L		7.5 V DC
Current consumption from U_L		max. 85 mA
Analog inputs		
Connection method		6 or 4-wire, twisted pair shielded cable
Number of inputs		2
Description of the inputs		Input channels for strain gauge
Bridge difference U_d		Measuring range specified by selecting the characteristic and the bridge voltage
Bridge voltage U_0		3.3 V / 5 V
Analog outputs		
Description of the outputs		Voltage output
Number of outputs		2
Impedance		> 58.3 Ω (typical; permissible total resistance of the strain gauge)
Output current		typ. 55 mA (With U_V = 3.3 V) / typ. 85 mA (With U_V = 5 V)
Characteristics		
Unipolar		+1 mV/V, +2 mV/V, +3 mV/V, +4 mV/V
Bipolar		±1 mV/V, ±2 mV/V, ±3 mV/V, ±4 mV/V
Measured value representation		15 bit + sign bit
Process data update		1 x per local bus cycle at a bus cycle time ≥ 1 ms
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		190 g
Dimensions	W / H / D	48.8 mm / 136 mm / 71.5 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline analog strain gauge input terminal, complete with accessories (connector and marking field) - Fast inputs - Fast and precise inputs - Can be verified, precise input	**IB IL SGI 2/F-PAC**	2878638	1

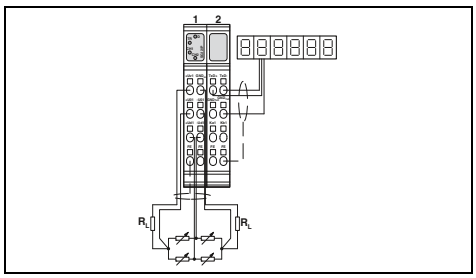
Accessories

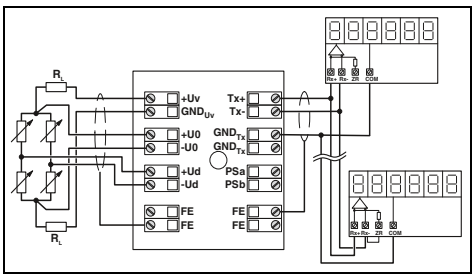
Calibration set, approval-related		
Shield plug	**IB IL SCN 6-SHIELD-TWIN**	2740245	5

2 fast and precise inputs

1 input that can be verified

PTB-BG





Technical data

Inline data jumper	
24 V DC 32 mA (in case of typical load of 350 Ohm per channel)	24 V DC max. 50 mA
7.5 V DC max. 95 mA	7.5 V DC typ. 80 mA
6 or 4-wire, twisted pair shielded cable	6-wire, twisted pair shielded cable
2 Input channels for strain gauge Measuring range specified by selecting the characteristic	1 Input channel for strain gauge Measuring range specified by selecting the characteristic
5 V	5 V
Jumper supply 2 > 43 Ω (per channel)	Voltage output 1 > 55 Ω
max. 115 mA (per channel)	max. 90 mA
-	-
±1 mV/V, ±2 mV/V, ±3 mV/V, ±3.33 mV/V, ±4 mV/V, ±5 mV/V, ±6 mV/V, manual characteristic value specification 16 bit, 20 bit, ASCII data record can be parameterized: 200 µs, 500 µs, 1 ms, 2 ms, 5 ms, 10 ms, 12.5 ms, 20 ms, 50 ms, 100 ms	±1 mV/V, ±2 mV/V, ±3 mV/V, ±3.33 mV/V, ±4 mV/V, ±5 mV/V Process data: status bits and measured value including decimal places of the gross/net display typ. 100 ms
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 220 g 48.8 mm / 136 mm / 71.5 mm Class A product, see page 525	Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 160 g 48.8 mm / 120 mm / 71.5 mm Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL SGI 2/P/EF-PAC	2702373	1

Accessories

IB IL SCN 6-SHIELD-TWIN	2740245	5

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL SGI 1/CAL	2700064	1

Accessories

IB IL SGI EU CALSET	2700165	1
IB IL SCN-6 SHIELD	2726353	5

Temperature measurement terminals

These Inline terminals can be used to connect thermocouples (UTH) and resistive temperature sensors (RTD).

Features of UTH inputs:

– Connection of thermocouples according to DIN EN 60584-1 and DIN 43710
– Absolute and differential temperature measurement
– Internal and external cold junction

Features of RTD inputs:

– Pt, Ni, Cu, KTY sensor types according to DIN and SAMA

The IB IL 24 TC Inline thermistor terminal is used for the evaluation of PTC thermistors. It makes it possible to monitor the temperature of motors and can be used in conjunction with Inline motor starters.

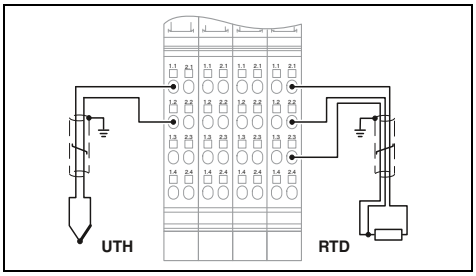
Notes:

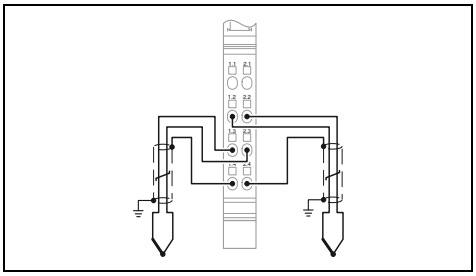
The driver function blocks can be obtained free of charge on the Internet at phoenixcontact.net/products under Download on the product page of the corresponding module.

8 inputs, UTH and RTD

2 UTH inputs

Ex:





Technical data

Local bus interface			
Connection method		Inline data jumper	Inline data jumper
Power supply for module electronics			
I/O supply voltage U_{ANA}		24 V DC	24 V DC
Current consumption from U_{ANA}		typ. 24 mA	typ. 11 mA
Communications power U_L		7.5 V DC	7.5 V DC
Current consumption from U_L		typ. 90 mA	typ. 43 mA
Analog inputs			
Connection method		2, 3-wire	2-wire
Number of inputs		8	2
Precision		-	typ. ± 0.6 °C
Description of the input		Temperature sensor inputs	Inputs for thermocouples or linear voltage
Linear resistance measuring range		-	-
Sensor types (RTD) that can be used		Pt, Ni sensors, linear resistors	-
Sensor types that can be used (TC)		B, C, E, J, K, L, N, R, S, T, U, mV input	U, T, L, J, E, K, N, S, R, B, C, W, HK
Measuring principle		Successive approximation	Successive approximation
Measured value representation		16 bits (15 bits + sign bit)	16 bits two's complement and other
Process data update		20 ms (with filter time of 20 ms or 100 ms) 100 ms (with filter time of 400 ms or 1600 ms)	30 ms (For both channels)
General data			
Connection method		Spring-cage connection	Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		188 g	67 g
Dimensions	W / H / D	48.8 mm / 119.8 mm / 71.5 mm	12.2 mm / 136.8 mm / 71.5 mm
EMC note			Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline analog input terminal, complete with accessories (connector and marking field) - With extended functions - For extended temperature range of -40°C ... +70°C	**IB IL TEMP 8 UTH/RTD-PAC**	2701000	1

Accessories

Description	Type	Order No.	Pcs./Pkt.
Shield plug	**IB IL SCN 6-SHIELD-TWIN**	2740245	5

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL TEMP 2 UTH-PAC	2861386	1
IB IL TEMP 2 UTH-XC-PAC	2701216	1

Accessories

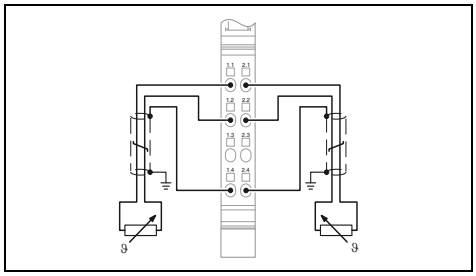
Type	Order No.	Pcs./Pkt.
IB IL SCN 6-SHIELD-TWIN	2740245	5

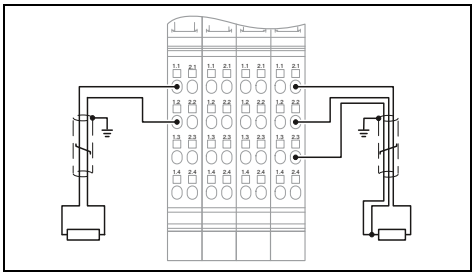
2 RTD inputs

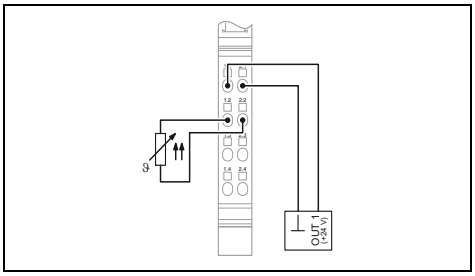
4 or 8 RTD inputs

1 thermistor input

Ex:







Technical data

Inline data jumper	
24 V DC	
max. 18 mA	
7.5 V DC	
typ. 43 mA	
2, 3, 4-wire	
2	
typ. ± 0.26 °C	
Input for resistive temperature sensors	
0 Ω ... 400 Ω / 0 Ω ... 4 kΩ	
Pt, Ni, KTY, Cu sensors, linear resistors	
-	
Successive approximation	
16 bits two's complement and other	
32 ms (Both channels with 3-wire technology)	
20 ms (One channel with 2-conductor technology and one channel with 4-conductor technology)	
Spring-cage connection	
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
67 g	
12.2 mm / 136.8 mm / 71.5 mm	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL TEMP 2 RTD-PAC	2861328	1
IB IL TEMP 2 RTD-XC-PAC	2701217	1

Accessories

IB IL SCN 6-SHIELD-TWIN	2740245	5

Technical data

	IB IL TEMP 4/8 RTD-PAC	IB IL TEMP 4/8 RTD/EF-PAC
Inline data jumper		
24 V DC		
typ. 28 mA		typ. 6 mA
7.5 V DC		
typ. 75 mA		typ. 95 mA
2, 3-wire		4-wire
8		
typ. ± 0.5 °C		typ. ± 0.05 °C
Input for resistive temperature sensors		
0 Ω ... 400 Ω / 0 Ω ... 20 kΩ		0 Ω ... 500 Ω / 0 Ω ... 5 kΩ
Pt, Ni, KTY, Cu sensors, linear resistors		
-		
Successive approximation		Sigma/Delta process
16 bits (15 bits + sign bit)		
6 ms (Up to 230 ms possible depending on operating mode)		1.8 s (Up to 3.3 s possible depending on operating mode)
Spring-cage connection		
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16		
190 g		
48.8 mm / 136.8 mm / 71.5 mm		48.8 mm / 119.8 mm / 71.5 mm
Class A product, see page 525		

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL TEMP 4/8 RTD-PAC	2863915	1
IB IL TEMP 4/8 RTD/EF-PAC	2897402	1
IB IL TEMP 4/8 RTD-EF-XC-PAC	2701218	1

Accessories

IB IL SCN 6-SHIELD-TWIN	2740245	5

Technical data

Inline data jumper	
24 V DC	
0 A DC	
7.5 V DC	
max. 60 mA	
2-wire	
1	
-	
Input for PTC thermistor	
2.7 kΩ ... 3.5 kΩ (Shutdown range, total resistance) / 50 Ω ... 2.25 kΩ (Operating range, total resistance)	
PTC thermistor according to DIN 44081 or DIN 44082	
-	
-	
-	
-	
Spring-cage connection	
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
50 g	
12.2 mm / 119.8 mm / 71.5 mm	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 TC-PAC	2861360	1

Accessories

IB IL SCN-6 SHIELD	2726353	5

Analog output terminals

These Inline terminals are used in applications in which analog actuators are to be controlled.

With these terminals, common current and voltage output ranges can be configured individually and channel-specifically.

Features:

- Connection of sensors in 2-wire technology
- Measured value output with 16-bit resolution
- Load of up to 500 Ω
- Bipolar outputs
- Short-circuit-proof current outputs
- Short update time of < 1 ms

Notes:

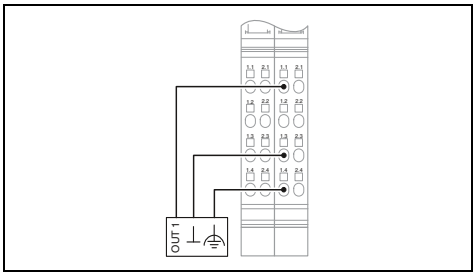
The driver function blocks can be obtained free of charge on the Internet at phoenixcontact.net/products under Download on the product page of the corresponding module.

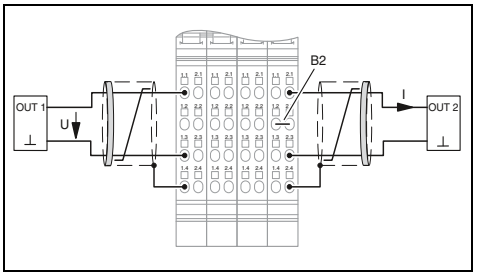
1 output

2 outputs

Ex:

Ex:





		Technical data	Technical data
Local bus interface			
Connection method		Inline data jumper	Inline data jumper
Power supply for module electronics			
I/O supply voltage U_{ANA}		24 V DC	24 V DC
Current consumption from U_{ANA}		typ. 50 mA	max. 95 mA
Communications power U_L		7.5 V DC	7.5 V DC
Current consumption from U_L		typ. 30 mA	max. 45 mA
Analog outputs			
Connection method		2-wire	2-wire
Number of outputs		1	2
Voltage output signal		0 V ... 10 V	0 V ... 10 V
Load/output load voltage output		> 2 kΩ	> 2 kΩ 0.03%
Current output signal		0 mA ... 20 mA / 4 mA ... 20 mA	0 mA ... 20 mA / 4 mA ... 20 mA
Load/output load current output		< 500 Ω	< 500 Ω
Protective circuit		Transient protection of outputs	Short-circuit protection of outputs
Characteristics			
Representation of output values		16 bits	16 bits (15 bits + sign)
Process data update		< 1 ms	< 1 ms
General data			
Connection method		Spring-cage connection	Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		126 g	125 g
Dimensions	W / H / D	24.4 mm / 135 mm / 71.5 mm	48.8 mm / 135 mm / 71.5 mm
EMC note		Class A product, see page 525	Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline analog output terminal, complete with accessories (connector and marking field)	**IB IL AO 1/SF-PAC**	2861315	1
- Machine Edition (ME version) - For extended temperature range of -40°C ... +70°C	**IB IL AO 1/SF-XC-PAC**	2701219	1

Accessories

Plug set	**IB IL AO/CNT-PLSET**	2732664	1
Shield plug for analog Inline terminals			
Plug			

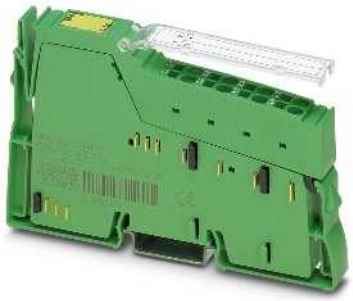
Ordering data

Type	Order No.	Pcs./Pkt.
IB IL AO 2/SF-PAC	2863083	1

Accessories

IB IL SCN-6 SHIELD	2726353	5

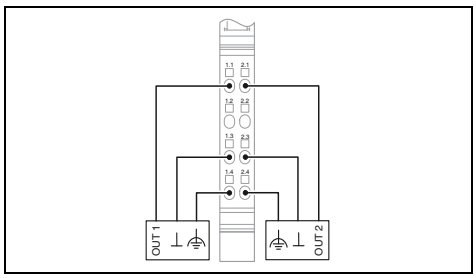
2 outputs, bipolar

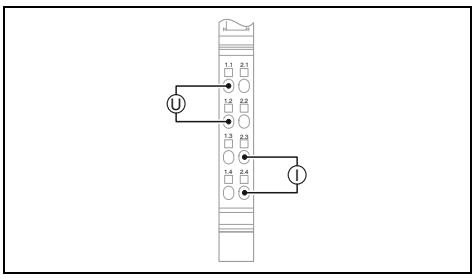


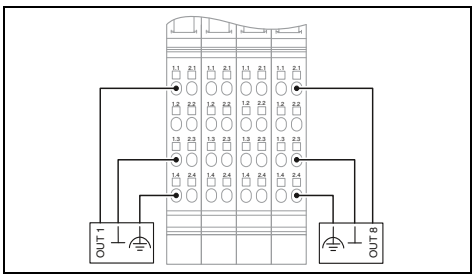
2 outputs, multifunctional

4/8 outputs, bipolar

Ex:







Technical data

	IB IL AO 2/U/BP-PAC	IB IL AO 2/U/BP-ME
	Inline data jumper	
	24 V DC max. 35 mA 7.5 V DC max. 40 mA	
	2-wire 2 0 V ... 10 V / -10 V ... 10 V > 2 kΩ 0.05 %	> 2 kΩ 0.02 %
	- - Transient protection of outputs	
	16 bits (15 bits + sign) < 2 ms	13 bits (12 bits + sign) < 1 ms
	Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 48 g 12.2 mm / 136.8 mm / 71.5 mm	12.2 mm / 119.8 mm / 71.5 mm
	Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL AO 2/U/BP-PAC	2861467	1
IB IL AO 2/U/BP-ME	2863957	1

Accessories

IB IL SCN 6-SHIELD-TWIN	2740245	5

Technical data

	Inline data jumper
	24 V DC typ. 24 mA (No-load) 7.5 V DC typ. 55 mA
	2-wire 2 0 V ... 10 V / -10 V ... 10 V > 1 kΩ 0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA ≤ 450 Ω Short-circuit and overload protection Transient protection
	12 bits (11 bits + sign bit) bus-synchronous
	Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 66 g 12.2 mm / 119.8 mm / 71.5 mm
	Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL AO 2/UI-PAC	2700775	1

Accessories

Technical data

	Inline data jumper
	24 V DC typ. 72 mA 7.5 V DC typ. 80 mA
	2-wire 8 0 V ... 10 V / -10 V ... 10 V / 0 V ... 5 V / -5 V ... 5 V > 2 kΩ 0.05 % - - Transient protection of outputs
	16 bits (15 bits + sign) < 2 ms (depends on operating mode)
	Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 215 g 48.8 mm / 136.8 mm / 71.5 mm
	Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL AO 4/8/U/BP-PAC	2878036	1
IB IL AO 4/8/U/BP-XC-PAC	2701164	1

Accessories

IB IL SCN-8	2726337	10

Intrinsically safe I/Os für the Ex area

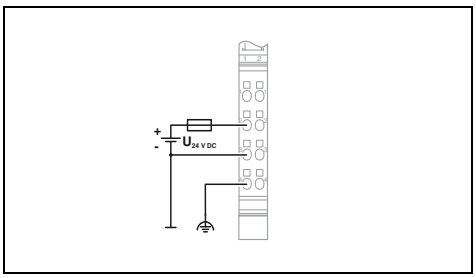
Connect intrinsically safe signals to the modular Inline I/O system.

Features:

- Disconnect terminal block for installation between non-intrinsically-safe I/O terminals and an intrinsically safe power supply
- Power supply to the intrinsically safe blue I/O terminals with safe electrical isolation
- I/O terminals for connecting intrinsically safe sensors or actuators in Zone 1 and Zone 0 of the Ex area
- Four configurable channels with diagnostic LEDs per I/O terminal
- Partition plate for installation between intrinsically safe I/O terminals and a further intrinsically safe power supply
- Fieldbus-independent diagnostics using FDT/DTM technology

Power terminal for intrinsically safe terminals

Ex:



Technical data

Local bus interface		
Connection method		Inline data jumper
Power supply for module electronics		
Supply for main circuit U_{Ex}		28 V DC ±5 %
Power supply at U_{Ex}		max. 1000 mA
Current consumption from U_{Ex}		-
Communications power U_L		5 V DC (via voltage jumper)
Power supply at U_L		1000 mA (max.)
Current consumption from U_L		-
Digital inputs		
Connection method		-
Input circuit		-
Protective circuit		-
Digital outputs		
Connection method		-
Description of the outputs		-
Analog inputs		
Connection method		-
Voltage input signal		-
Current input signal		-
Analog outputs		
Connection method		-
Current output signal		-
Protective circuit		-
Temperature input		
Sensor types (RTD) that can be used		-
Sensor types that can be used (TC)		-
Linear resistance measuring range		-
Measured value resolution		-
Data formats		-
Protective circuit		-
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Dimensions	W / H / D	48.8 mm / 119.9 mm / 70.4 mm
Ambient temperature (operation)		-25 °C ... 60 °C
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline terminal, Ex-i, complete with accessories (connector and marking field)	**IB IL EX-IS PWR IN-PAC**	2869910	1

Accessories

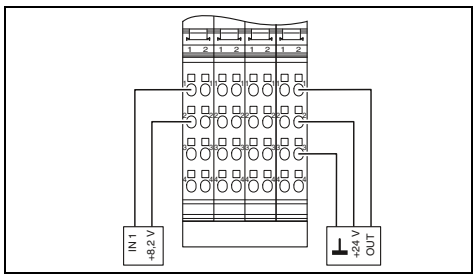
Inline isolator terminal	**IB IL EX PWR-ISO-PAC**	2869909	1

4 selectable digital channels, input (also NAMUR) or output

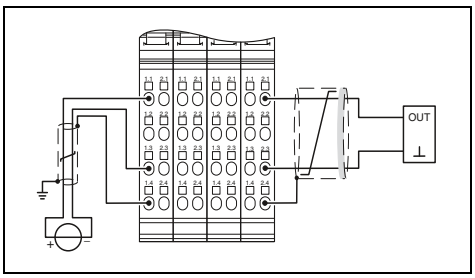
4 selectable analog channels, input or output

4 selectable temperature inputs, RTD or TC

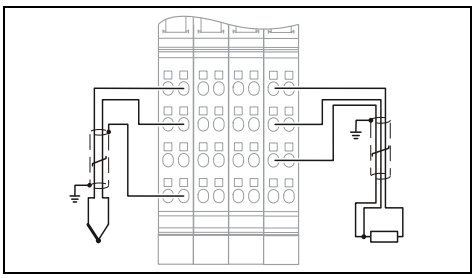
Ex:



Ex:



Ex:



Technical data	Technical data	Technical data
Inline data jumper	Inline data jumper	Inline data jumper
28 V DC	28 V DC	28 V DC
-	-	-
max. 190 mA	max. 187 mA	max. 80 mA
5 V DC (via voltage jumper)	5 V DC (via voltage jumper)	5 V DC (via voltage jumper)
-	-	-
max. 50 mA	max. 50 mA	max. 50 mA
2-wire	-	-
Floating contacts and 2-wire NAMUR proximity sensor (EN 60947-5-6)	-	-
Polarity protection, surge protection	-	-
3-wire	-	-
Digital passive output	-	-
-	2, 3-wire	-
-	0 V ... 10 V	-
-	0 mA ... 20 mA / 4 mA ... 20 mA	-
-	2-wire	-
-	0 mA ... 20 mA / 4 mA ... 20 mA	-
-	Polarity protection, surge protection	-
-	-	2 and 3-wire, Pt, Ni (DIN 100, 200, 500, 1000)
-	-	J, K, E, R, S, T
-	-	0 Ω ... 800 Ω / 0 Ω ... 5000 Ω
-	-	16 bit (15 bit + sign bit)
-	-	IB IL, S7-compatible
-	-	Polarity protection, surge protection
Spring-cage connection	Spring-cage connection	Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
48.8 mm / 119.8 mm / 71.5 mm	48.8 mm / 136.8 mm / 71.5 mm	48.8 mm / 136.8 mm / 71.5 mm
-25 °C ... 60 °C	-25 °C ... 60 °C	-25 °C ... 60 °C
Class A product, see page 525	Class A product, see page 525	Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL EX-IS DIO 4/NAM-PAC	2869911	1

Accessories

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL EX-IS AIO 4/EF-PAC	2869912	1

Accessories

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL EX-IS TEMP 4 RTD/TC-PAC	2869913	1

Accessories

Branch terminals

The IBS IL 24 RB-T-PAC and IBS IL 24 RB-LK-PAC INTERBUS branch terminals make it possible to add more system levels to an INTERBUS network. To do so, you can choose between copper cable or fiber optics as the transmission medium. You can operate up to 15 levels in total in the network.

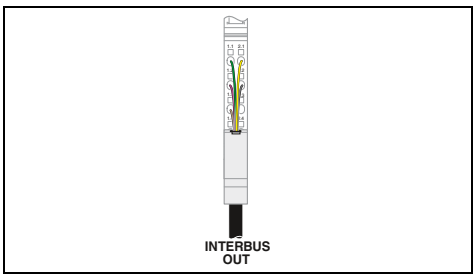
The IB IL 24 FLM-PAC Inline branch terminal enables the direct connection of Fieldline Modular M8 and M12 local bus devices to an Inline Modular station.

The IB IL 24 FLM MUL-TI-PAC branch terminal enables the integration of several Fieldline Modular M8 local buses in an Inline station.

By combining the IB IL 24 FLM-PAC Inline branch terminal and IB IL 24 LSKIP-PAC local bus extension terminal, a so-called "line skip" can be implemented within an Inline station. This means that the Inline station can extend onto another DIN rail without having to use a new bus coupler.

Remote bus branch via copper cable

Ex:



Technical data

Interface		
Connection method		Inline data jumper Inline shield plug
Local bus interface		
Connection method		Inline data jumper
Power supply for module electronics		
Supply voltage		-
Supply voltage range		-
Max. current consumption		-
Communications power U_L		-
Power supply at U_L		-
Current consumption from U_L		-
I/O supply voltage U_{ANA}		24 V DC
Current consumption from U_{ANA}		typ. 29 mA
Power supply at U_{ANA}		-
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		67 g
Dimensions	W / H / D	12.2 mm / 135 mm / 71.5 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline branch terminal, complete with accessories (connector and marking field)	**IBS IL 24 RB-T-PAC**	2861441	1
- For extended temperature range of -40°C ... +70°C	**IBS IL 24 RB-T-XC-PAC**	2701151	1

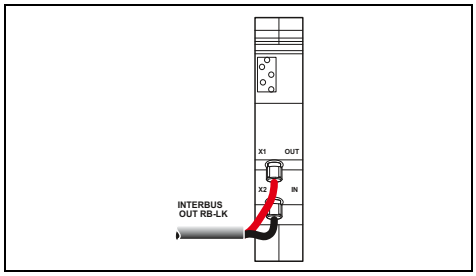
Accessories

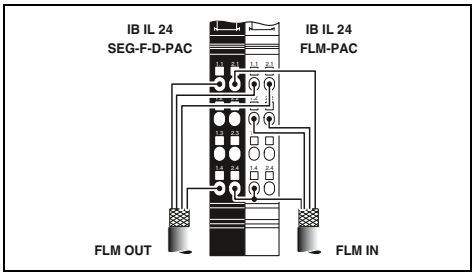
Inline segment terminal, complete with accessories (connector and marking field)			
Shield plug for analog Inline terminals	**IB IL SCN-6 SHIELD**	2726353	5

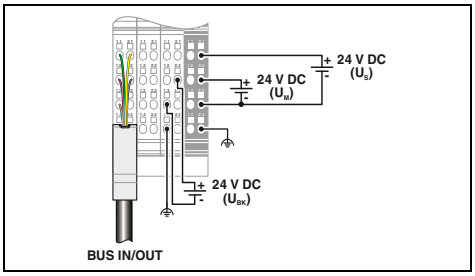
Remote bus branch via fiber optics

Fieldline Modular extension

Local bus extension terminal







Technical data

FSMA plugs	
Inline data jumper	
-	
-	
-	
-	
-	
-	
24 V DC	
typ. 42 mA	
max. 51 mA	
-	
FSMA plugs	
-	
89 g	
24.4 mm / 119.8 mm / 71.5 mm	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
IBS IL 24 RB-LK	2878117	1

Accessories

Technical data

	IB IL 24 FLM-PAC	IB IL 24 FLM MULTI-PAC
	Inline shield plug	
	Inline data jumper	
	-	
	-	
	-	
	7.5 V DC	
	-	
	110 mA	50 mA
	-	
	-	
	-	
	Spring-cage connection	
	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
	43 g	
	12.2 mm / 136.8 mm / 71.5 mm	
	Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 FLM-PAC	2736903	1
IB IL 24 FLM MULTI-PAC	2737009	1

Accessories

IB IL 24 SEG/F-PAC	2861373	1
IB IL SCN-6 SHIELD	2726353	5

Technical data

Inline shield plug	
Inline data jumper	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
max. 1.25 A (with max. number of connected I/O terminal blocks)	
7.5 V DC	
max. 2 A DC (observe derating)	
-	
24 V DC	
-	
max. 0.5 A DC (observe derating)	
Spring-cage connection	
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
207 g	
48.8 mm / 135 mm / 71.5 mm	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 LSKIP-PAC	2897457	1

Accessories

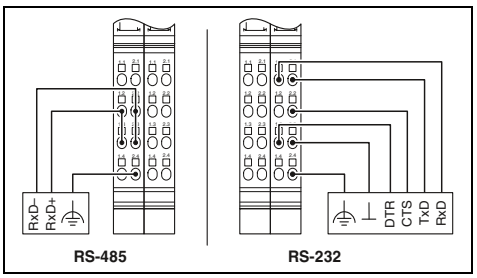
Serial communication terminals

The serial Inline communication terminal can be used to connect devices with a serial interface, (e.g., barcode scanners).

Features:

– RS-232 or RS-485/422 communication
– Baud rates of up to 250 kBaud
– Number of data bits, stop bits, and parity can be set
– Communication via process data
– Process data width can be set using DIP switches

1 serial RS-485/422 or RS-232 interface, process data communication



Technical data

Local bus interface		
Connection method		Inline data jumper
Serial port		
Interface		RS-232, RS-485, RS-422
Power supply for module electronics		
Communications power U_L		7.5 V
Current consumption from U_L		typ. 78 mA
Serial input/output channel		
Input buffer		4 kbyte
Output buffer		1 kbyte
Transmission speed		110 bps ... 250000 bps (configurable)
Data bits		5 ... 8
Stop bits		1 or 2
Parity		Even, odd or no parity
Transmission type		Transparent mode, end-to-end mode, XON/XOFF
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		135 g
Dimensions	W / H / D	24.4 mm / 135 mm / 71.5 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline communication channel, complete with accessories (connector and marking field) - 1 serial input and output channel as RS-485/RS-422 or RS-232 version	**IB IL RS UNI-PAC**	2700893	1

Accessories

Plug set	**IB IL AO/CNT-PLSET**	2732664	1

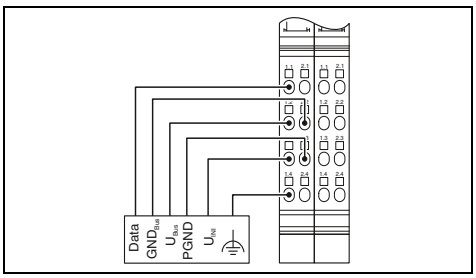
INTERFACE system bus master terminal

The Inline terminal can be used to connect INTERFACE modules to the Inline station and thus the higher-level bus system via the INTERFACE system bus.

Features:

- Easy integration of up to 8 INTERFACE EMM and EEM modules with firmware 1.03 or later
- User-friendly parameterization, configuration, and diagnostics using DTMs (Device Type Managers)
- Serial interface (S port) including a memory stick for saving the configuration
- Acquisition and output of up to 31 measured values and 16 manipulated variables
- Application: Motor and energy data management

INTERFACE system bus master



Technical data

Local bus interface	
Connection method	Bus base module
Communication interface	
Interface	INTERFACE system bus
Connection method	Inline shield plug
Programming interface	
Interface	Programming interface (S port)
Connection method	IFS-USB-PROG-ADAPTER
Power supply for module electronics	
Communications power U_L	7.5 V
Current consumption from U_L	typ. 66 mA
Supply of the connected INTERFACE modules	
9 V supply	
Voltage range	8.1 V ... 9.9 V
Type of protection	Short-circuit protection, electronic
Max. current carrying capacity	300 mA
24 V supply (EEM, EMM)	
Voltage range	19.2 V ... 30 V (including ripple)
Type of protection	Short-circuit protection, electronic and thermal
Max. current carrying capacity	4 A
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	
Width	24.4 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline Modular communication terminal, complete with accessories (connector and marking field)			
- For connecting the INTERFACE system bus	**IB IL IFS-MA-PAC**	2692720	1

Accessories

Plug set	**IB IL AO/CNT-PLSET**	2732664	1
Programming adapter with USB interface	**IFS-USB-PROG-ADAPTER**	2811271	1
Multi-functional memory block for the Interface system	**IFS-CONFSTICK**	2986122	1
Assembled connecting cable, IL-IFS, 2 m in length	**IMC 1,5/ 5-ST-3,81SET IL IFS 2M**	1784729	1

DALI master terminals

In addition to DALI communication, the DALI master also provides the DALI bus supply. You do not need an external DALI power supply. This terminal can be extended with up to three IB IL DALI-PAC devices, each of which represents another DALI master.

Features:

– Up to 64 DALI devices per master terminal
– Safe electrical isolation of the DALI bus
– Protection of the DALI bus against accidental connection of the mains voltage (up to 250 V AC)
– Diagnosis, transmitting and receiving display
– Function blocks for PC Worx are available

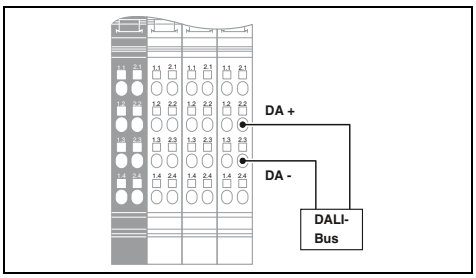
The DALI multimaster is used to communicate with both DALI ballasts and DALI sensors. The DALI multimaster contains the DALI bus supply.

IB IL DALI/MM-PAC features:

– Up to 64 DALI devices
– DALI supply can be switched off
– Suitable for single and multimaster operation
– Protection of the DALI bus against accidental connection of the mains voltage (up to 250 V AC)

DALI master

EAC



Technical data

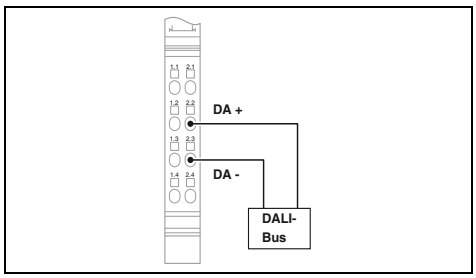
Local bus interface		
Connection method		Inline data jumper
Power supply for module electronics		
Communications power U_L		7.5 V DC
Current consumption from U_L		max. 38 mA
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.08 ... 1.5 mm² / 24 - 16
Weight		194 g
Dimensions	W / H / D	48.8 mm / 119.8 mm / 71.5 mm

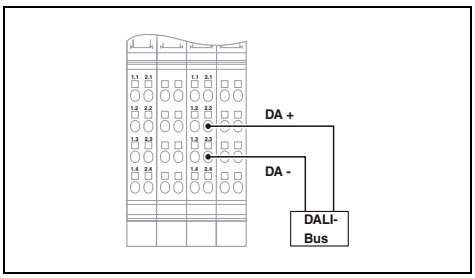
Ordering data

Description	Type	Order No.	Pcs./Pkt.
1-channel DALI-master, complete with accessories (connector and marking field) - Integrated DALI power supply - Extension for IB IL DALI/PWR-PAC	**IB IL DALI/PWR-PAC**	2897813	1

Extension for DALI master

DALI multimaster





Technical data

Inline data jumper	
7.5 V DC max. 38 mA	
Spring-cage connection 0.2 ... 1.5 mm² / 0.08 ... 1.5 mm² / 24 - 16 57 g 12.2 mm / 119.8 mm / 71.5 mm	

Technical data

Inline data jumper
7.5 V max. 75 mA
Spring-cage connection 0.2 ... 1.5 mm² / 0.08 ... 1.5 mm² / 24 - 16 180 g 48.8 mm / 119.8 mm / 71.5 mm

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL DALI-PAC	2897910	1

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL DALI/MM-PAC	2700605	1

CAN master terminal

The Inline terminal can be used to connect a lower-level CAN network. Within the Inline station, the terminal acts as a CAN master for the CAN system.

Any CAN frames with 11-bit or 29-bit identifier can be transmitted via the terminal by the PLC to all types of CAN devices, regardless of the CAN protocol present there.

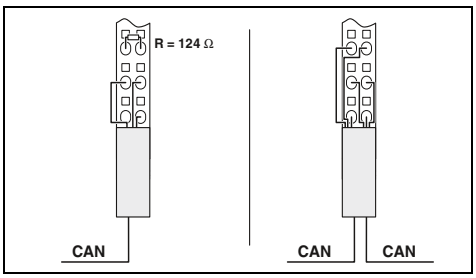
Features:

- Transparent mode
- CAN 2.0A (11-bit identifier; standard frame)
- CAN 2.0B (29-bit identifier; extended frame)
- Transmission speed of 10 kbps to 1 Mbps
- Maximum data width: 126 bytes + 2-byte command/status word
- User-friendly controller-independent software tool for configuring the CAN network
- Serial interface (S port) including a memory stick for saving the configuration

Notes:

The driver function blocks can be obtained free of charge on the Internet at phoenixcontact.net/products under Download on the product page of the corresponding module.

CAN master



Technical data

Local bus interface		
Connection method		Bus base module
Communication interface		
Interface		CAN bus
Connection method		Inline shield plug
Programming interface		
Interface		CAN bus
Connection method		Inline shield plug
Power supply for module electronics		
Communications power U_L		7.5 V
Current consumption from U_L		typ. 110 mA
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		
Dimensions	W / H / D	12.2 mm / 136.8 mm / 71.5 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline Modular communication terminal, complete with accessories (connector and marking field)			
- For connecting a CAN bus system	**IB IL CAN-MA-PAC**	2700196	1
- For extended temperature range of -40°C ... +70°C	**IB IL CAN-MA-XC-PAC**	2701160	1

Accessories

Shield plug	**IB IL SCN 6-SHIELD-TWIN**	2740245	5
Multi-functional memory block for the Interface system	**IFS-CONFSTICK**	2986122	1
Configuration cable for IB IL CAN-MA-PAC	**IB IL CAN-MA CONF-CAB**	2700620	1

PROFIBUS terminal block

The PROFIBUS terminal block enables connection of PROFIBUS modules to a PC Worx controller via INTERBUS or PROFINET.

Likewise, a PC Worx controller can be integrated into an existing PROFIBUS system.

The terminal block supports both the master and slave functions.

Features:

- PROFIBUS DP V0 master for a maximum of ten PROFIBUS slaves with up to 48 data words of input and output data.
- PROFIBUS DP V0 master for a maximum of three PROFIBUS slaves with up to 56 data words of input and output data.
- PROFIBUS DP slave with a maximum of 56 data words
- User-friendly parameterization via PC Worx
- Local plug-in memory for backing up the configuration

PROFIBUS master/slave

Technical data

Local bus interface		
Connection method		Bus base module
Communication interface		
Interface		PROFIBUS DP V0 master/slave
Connection method		9-pos. D-SUB socket
Power supply for module electronics		
Communications power U_L		7.5 V
Current consumption from U_L		typ. 98 mA
General data		
Connection method		9-pos. D-SUB socket
Weight		
Dimensions	W / H / D	48.8 mm / 119.8 mm / 71.5 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline PROFIBUS master, complete with accessories (connector and marking field)	**IB IL PB MA-PAC**	2700630	1

Accessories

D-SUB connector, 9-pos. with two cable entries, termination resistor can be switched on via slide switch	**SUBCON-PLUS-PROFIB**	2744348	1

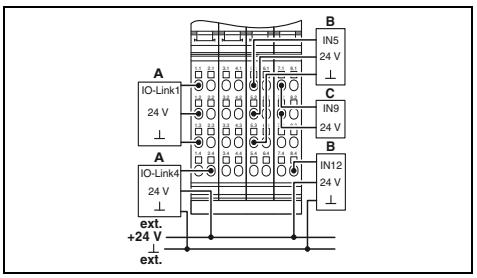
IO-Link master terminal

The Inline IO-Link master enables the connection of IO-Link-compatible sensors and actuators (IO-Link devices).

Features:

– 4 type A IO-Link ports
– Transmission speeds
  COM1: 4.8 kBaud
  COM2: 38.4 kBaud
  COM3: 230.4 kBaud
– Optional use of the IO-Link ports in SIO mode as standard inputs or standard outputs
– Connections for 12 digital sensors
– IO-Link specification 1.0

4 IO-Link ports, 12 digital inputs



Technical data

Local bus interface		
Connection method		Inline data jumper
Power supply for module electronics		
Communications power U_L		7.5 V
Current consumption from U_L		max. 100 mA
Digital inputs		
Connection method		3-wire
Number of inputs		12
IO-Link ports		
Connection method		2, 3-wire
Number of ports		4
IO-Link port supply		
Nominal voltage for I/O supply		min. U_S - 1 V
Nominal current for every IO-Link port		max. 200 mA
Nominal current per device		max. 800 mA
Digital inputs in the SIO mode		
Number of inputs		max. 4
Input voltage		24 V DC
Input voltage range		0 V DC ... 30 V DC
Nominal input current		5.5 mA (at 24 V DC)
Current flow		linear in the range of 0 V ... 7 V, constant in the range of 7 V ... 30 V
Signal delay		3 ms
Digital outputs in the SIO mode		
Number of outputs		max. 4
Nominal output voltage		U_S - 3 V (U_{OUT} at I_{CQ} ≤200 mA)
Nominal current per channel		max. 200 mA ($I_{Nominal}$)
Maximum total current consumption		max. 800 mA
Protective circuit		Short-circuit protection Integrated per channel
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		200 g
Dimensions	W / H / D	48.8 mm / 119.8 mm / 71.5 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline IO-Link master, complete with accessories (connector and marking field)	**IB IL 24 IOL 4 DI 12-PAC**	2692717	1

Counter terminal

The Inline counter terminal detects and processes fast pulse sequences from sensors.

Possible operating modes:

– Event counting
– Frequency measurement (time- or state-controlled)
– Time measurement (period or pulse length)
– Pulse generator

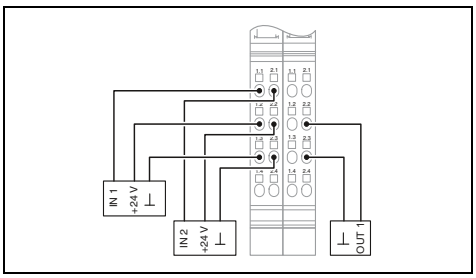
Features:

– 1 counter
– 24 V sensor supply including monitoring
– Processing of 5 V or 24 V signals
– Input frequency of up to 100 kHz
– Gate input
– 24-bit counter value for event counting and frequency measurement
– Frequency measurement resolution of up to 0.1 Hz
– 16-bit counter value for time measurement
– Time measurement resolutions: 2 µs, 1 ms, and 10 ms
– 24 V onboard output switches when relation condition is met
– Start and final value can be modified during counting

Notes:

The driver function blocks can be obtained free of charge on the Internet at phoenixcontact.net/products under Download on the product page of the corresponding module.

1 counter input



Technical data

Local bus interface		
Connection method		Inline data jumper
Power supply for module electronics		
Supply voltage		24 V DC
Supply voltage range		19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Communications power U_L		7.5 V DC
Current consumption from U_L		typ. 40 mA
Counter input		
Operating modes		Event counting, frequency/time measurement
Input frequency		max. 100 kHz
Input voltage		24 V DC (Nominal voltage) / 30 V DC (maximum)
Input current		typ. 5 mA
Control input		
Connection method		2, 3-wire
Input voltage		24 V DC (Nominal voltage) / 30 V DC (maximum)
Input current		typ. 5 mA
Digital outputs		
Number of outputs		1
Connection method		2-wire
Output voltage		24 V DC (Nominal voltage)
Output current		max. 0.5 A (Nominal current)
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		130 g
Dimensions	W / H / D	24.4 mm / 135 mm / 71.5 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline counter terminal, complete with accessories (connector and marking field)			
	IB IL CNT-PAC	2861852	1
- For extended temperature range of -40°C ... +70°C	**IB IL CNT-XC-PAC**	2702134	1

Accessories

Plug set	**IB IL AO/CNT-PLSET**	2732664	1

Pulse width terminal

The Inline PWM terminal outputs signals; depending on the operating mode, either the pulse length, period length or frequency can be set.

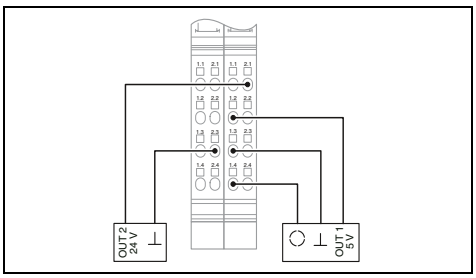
Features:

- 2 independent channels
- Output of 5 V or 24 V signals
- Maximum frequency of 50 kHz
- Pulse width modulation:
  Period length can be set in increments from 100 µs to 10 s, duty factor in 0.39% increments)
- Frequency output: can be set between 0 Hz and 50 kHz
- Single pulse output: pulse length can be set between 10 µs and 25.5 s
- Pulse/direction signal output without integrated ramp function to control step motor power sections

Notes:

The driver function blocks can be obtained free of charge on the Internet at phoenixcontact.net/products under Download on the product page of the corresponding module.

Pulse width modulation, frequency generator or pulse/direction signal output



Technical data

Local bus interface		
Connection method		Inline data jumper
Power supply for module electronics		
Supply voltage		24 V DC
Supply voltage range		19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Communications power U_L		7.5 V
Current consumption from U_L		max. 130 mA
Digital outputs		
Number of outputs		max. 2
Connection method		2-wire (shielded)
Output voltage		24 V / 5 V DC
Output current		10 mA (5 V); 500 mA (24 V)
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		130 g
Dimensions	W / H / D	24.4 mm / 136.8 mm / 71.5 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline function terminal, complete with accessories (connector and marking field)	**IB IL PWM/2-PAC**	2861632	1

Accessories

Plug	**IB IL SCN-8**	2726337	10
Shield plug	**IB IL SCN 6-SHIELD-TWIN**	2740245	5

Power measurement terminal

This module is designed for use within an Inline station.

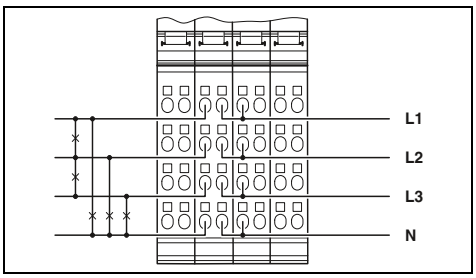
The power measurement terminal enables you to analyze AC networks and is used in applications where conventional analog meters in distribution systems no longer meet growing requirements. This is particularly true in cases where it is important to analyze distortions and harmonics as well as measuring current, voltage, and power.

Analysis of AC networks

Features:

– 3 phases plus neutral conductor, connectable
– Direct current detection, 1 A or 5 A
– Line-to-line voltage up to 690 V AC (L-L)
– Specification according to EN 61010-1:2001:
  - Measurement category 3 (300 V AC (L-N))
  - Measurement category 2 (400 V AC (L-N))
– Network variables:
  - Phase currents and neutral conductor current
  - Phase and phase conductor voltages
  - Real, reactive, and apparent powers
  - Power factors of phases
  - Power flow directions
  - Frequency
– Operating modes:
  - Basic measured values
  - Scanning measured values (64 scans/full wave)
– Synchronization
– Triggers for measurement intervals can be freely defined
– Harmonic analysis up to 31st harmonic
– Determination of maximum value
– Operating hours counter
– Power meter
– Bimetal filtering

EAC



Technical data

Local bus interface	
Designation	Inline local bus
Connection method	Inline data jumper
Power supply for module electronics	
Communications power U_L	7.5 V
Current consumption from U_L	typ. 130 mA
Current measuring input	
Nominal current I_N	5 A AC (1 A AC, depending on parameterization)
Overload	1.4 times continuous; 150 A for 10 ms
Precision	0.25 % (of the nominal value)
Scanning rate	22.4 k samples/50 Hz
Voltage measuring input	
Nominal voltage U_N	400 V AC (Nominal phase voltage)
Nominal voltage U_N	0 V AC ... 690 V AC (Phase conductor voltage)
Overload	1.2 times the nominal value
Precision	0.25 % (of the nominal value)
Scanning rate	22.4 k samples/50 Hz
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	200 g
Width	48.8 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline power measurement terminal, complete with accessories (connector and marking field)	**IB IL PM 3P/N/EF-PAC**	2700965	1

Accessories

Marking field, width: 12.2 mm	**IB IL FIELD 2**	2727501	10
Marking field, width: 48.8 mm	**IB IL FIELD 8**	2727515	10

Position detection terminals

The Inline position detection terminals allow you to record positions via incremental encoders, absolute encoders with SSI interface or magnetostrictive encoders with start/stop interface.

IB IL INC-IN-PAC features:

– Symmetrical and asymmetrical incremental encoders with or without Z trace can be connected
– Shield connection
– Maximum input frequency of 300 kHz
– Single, double or quadruple evaluation
– 25-bit actual position value
– 5 V and 24 V encoder supply including monitoring
– 3 digital inputs to connect two limit switches and one home position switch
– 5 homing functions
– Direction of rotation indicator via LED
– Open circuit detection

IB IL SSI-IN-PAC features:

– 1 single or multi-turn encoder with up to 25-bit resolution can be connected
– Transmission frequency of up to 1 MHz
– 5 V encoder supply including monitoring
– Gray or binary code
– Parity monitoring
– Reversal of direction of rotation
– Shield connection

IB IL IMPULSE-IN-PAC features:

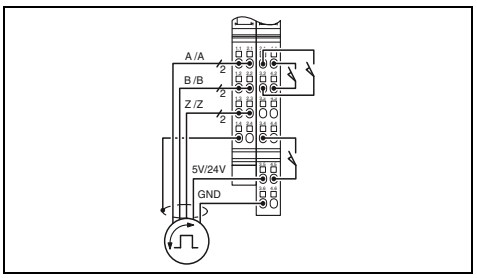
– 1 magnetostrictive encoder can be connected
– Evaluation of the position of a magnet
– Length measuring range of up to 3.85 m
– Position resolution of 5 µm
– Ultrasonic encoder speed of 2500 m/s to 2999.99 m/s
– 24 V encoder supply including monitoring
– Shield connection

Notes:

The driver function blocks can be obtained free of charge on the Internet at phoenixcontact.net/products under Download on the product page of the corresponding module.

Input for incremental encoder with square-wave signal (symmetrical or asymmetrical)

Ex:



Technical data

Local bus interface		
Connection method		Inline data jumper
Power supply for module electronics		
Communications power U_L		7.5 V DC
Current consumption from U_L		max. 70 mA
Encoder supply voltage		5 V DC / 24 V DC
Encoder supply current		max. 250 mA
Drawing encoder supply voltage		Main circuit U_M
Drawing initiator supply		Main circuit U_M
Incremental encoder input		
Number of inputs		1
Description of the input		Symmetrical (RS-422) or asymmetrical (3.5 V to -27 V)
Input frequency (24 V)		0 Hz ... 300 kHz
Absolute position encoder input		
Number of inputs		-
Transmission frequency		-
Adjustable resolution		-
Input for magnetostrictive encoders		
Length measuring range		-
Ultra-sound speed (gradient)		-
Digital inputs		
Number of inputs		3
Input voltage range "0" signal		-30 V DC ... 5 V DC
Input voltage range "1" signal		15 V DC ... 30 V DC
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		143 g
Dimensions	W / H / D	24.4 mm / 140.5 mm / 71.5 mm

Ordering data

Inline position detection terminal, complete with accessories (connector and marking field)		
IB IL INC-IN-PAC	2861755	1

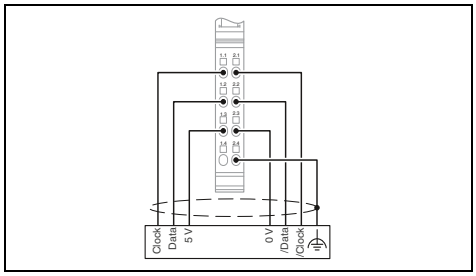
Accessories

Connector		
IB IL SCN-12-ICP	2727611	10
Shield plug for analog Inline terminals		
IB IL SCN-6 SHIELD	2726353	5

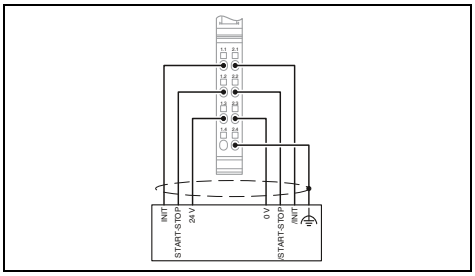
Input for absolute rotation or travel measuring systems with SSI interface

Input for magnetostrictive encoder with start/stop interface

EAC
Ex:



EAC



Technical data	
Inline data jumper	
7.5 V DC max. 28 mA 5 V DC max. 250 mA Main circuit U_M -	
- -	
-	
1 100 kHz / 200 kHz / 400 kHz / 800 kHz / 1 MHz 25 bit (maximum)	
- -	
- - -	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 71 g 12.2 mm / 135 mm / 71.5 mm	

Technical data	
Inline data jumper	
7.5 V max. 70 mA 24 V max. 250 mA Main circuit U_M -	
- -	
-	
- - -	
> 0 mm ... 3850 mm (Resolution: 5 µm) 2500 m/s ... 2999.99 m/s (Firmware 1.22 and higher) 2750 m/s ... 2898 m/s (Firmware 1.21 and higher)	
- - -	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 71 g 12.2 mm / 135 mm / 71.5 mm	

Ordering data		
IB IL SSI-IN-PAC	2819574	1

Accessories		
IB IL SCN-6 SHIELD	2726353	5

Ordering data		
IB IL IMPULSE-IN-PAC	2861768	1

Accessories		
IB IL SCN-6 SHIELD	2726353	5

Positioning control terminals

The Inline positioning control system is suitable for point-to-point positioning of binary-controlled drives, e.g., pole-changing AC motors, in accordance with the rapid motion/creeping motion principle and supports the positioning of rotary and linear axes.

It can be used to perform simple positioning tasks, such as positioning:
– Transportation equipment
– Format adjustments (adjustable axes)
– Tools

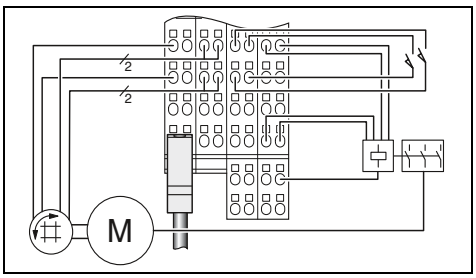
It is not necessary to set control parameters here. After specifying a target position, the terminal automatically, and therefore independently of the bus, assumes control of the drive by specifying both the traversing rate (rapid motion/creeping motion) and the traversing direction via four binary outputs and signaling when the target point has been reached.

Features:
– Position detection using absolute encoders with SSI interface
– 5 V and 24 V encoder supply including monitoring
– 24 V sensor supply including monitoring
– 3 digital inputs
– 4 digital outputs
– Software limit switch
– Integrated monitoring functions
– Gear ratio can be parameterized
– Backlash and friction compensation
– Startup using hand-held operator panel mode

Notes:

The driver function blocks can be obtained free of charge on the Internet at phoenixcontact.net/products under Download on the product page of the corresponding module.

SSI interface for absolute encoders



Technical data

Local bus interface		
Connection method		Inline data jumper
Power supply for module electronics		
Communications power U_L		7.5 V DC
Current consumption from U_L		max. 60 mA
Encoder supply voltage		5 V DC / 24 V DC
Encoder supply current		500 mA
Drawing encoder supply voltage		Main circuit U_M
Drawing initiator supply		Main circuit U_M
Absolute position encoder input		
Number of inputs		1
Transmission frequency		400 kHz
Adjustable resolution		26 bit (maximum)
Digital inputs		
Number of inputs		3
Input voltage range "0" signal		-30 V DC ... 5 V DC
Input voltage range "1" signal		13 V DC ... 30 V DC
Digital outputs		
Number of outputs		4
Output voltage		24 V DC
Output current		2 A
General data		
Connection method		Spring-cage connection
Connection data solid/stranded/AWG		0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight		210 g
Dimensions	W / H / D	48.8 mm / 140.5 mm / 71.5 mm

Ordering data

Inline positioning terminal, complete with accessories (connector and marking field) - Absolute encoder input	**IB IL SSI-PAC**	2861865	1

Accessories

Connector	**IB IL SCN-12-ICP**	2727611	10
Shield plug for analog Inline terminals	**IB IL SCN-6 SHIELD**	2726353	5

Servo controller for EC motors

The IB IL EC AR 48/10A Inline servo controller is a universal power output module with a 4 quadrant function for permanently excited DC motors with brushgears or electronically commutated DC motors (EC motors) with up to 450 W power output.

Features:

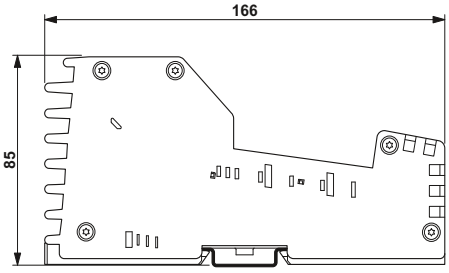
- Variable frequency drive with positioning function
- Electronic commutation with Hall sensors
- Point-to-point positioning function
- Speed profile: Trapezoid or S curve
- Position, speed, and torque control
- Position detection with incremental encoder
- Homing
- Max. 48 V/10 A
- 97.6 mm design width
- Software tool for operation and startup including oscilloscope function
- Cycle time of the position controller: 1 ms
- For single- and multi-axis applications

Applications:

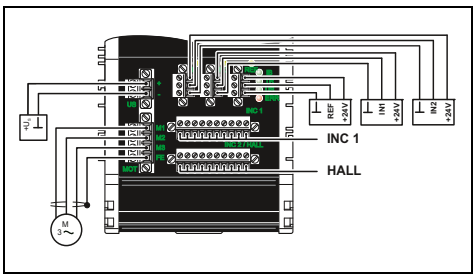
- Handling machines in the semiconductor industry, in small parts protection, in the electronics industry, and in test engineering
- Assembly machines in small appliance production
- Bearing and conveying technology for small loads
- Format adjustment in processing machines and packaging machines
- Laboratory technology

Notes:

The driver function blocks can be obtained free of charge on the Internet at phoenixcontact.net/products under Download on the product page of the corresponding module.



Servo controller for 24 V motors with positioning and homing function



Technical data

Interface	
Inline local bus	Inline data jumper
Startup and diagnostics	RS-232
Power supply for module electronics	
Communications power U_L	7.5 V DC
Current consumption from U_L	typ. 30 mA
Power supply	
Connection method	2-pos. COMBICON connector
Supply voltage range	12 V DC ... 48 V DC ±15 % (Surge voltage shutdown U_S > 60 V DC)
Motor output	
Output name	1 permanently excited DC motor with or without brushgear
Connection method	4-pos. COMBICON connector with shield clip
Nominal current range	max. 10 A (Starting/continuous current)
Nominal motor power	450 W (Power consumption)
Function	4 quadrant servo controller
Incremental encoder input	
Description of the input	Symmetrical incremental encoders
Input frequency (5 V)	max. 1 MHz
Description of the input	Asymmetrical incremental encoders
Input frequency (5 V)	max. 500 kHz (At 4 V voltage level)
Input frequency (24 V)	max. 100 kHz (At 20 V voltage level)
Digital inputs	
Number of inputs	3
Connection method	MINI COMBICON
Connection method	3-wire (Signal, Us, GND)
General data	
Connection method	Screw connection
Connection data solid/stranded/AWG Front MSTB	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12
Connection data solid/stranded/AWG Front MC	0.14 ... 2.5 mm² / 0.2 ... 2.5 mm² / 28 - 16
Weight	880 g
Width	97.6 mm
EMC note	Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Inline variable frequency drive, including connector			
- For DC motors with brushgear and EC motors (without brushgear)	**IB IL EC AR 48/10A-PAC**	2819587	1

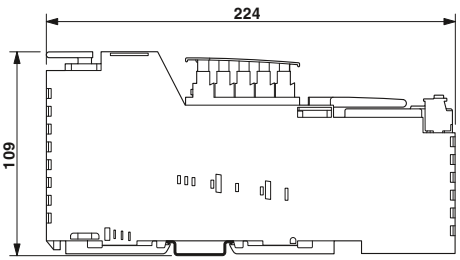
Power-level terminals

The single-channel power-level terminals for direct and reversing starters and the electromechanical version with electronic motor protection enable a three-phase asynchronous motor to be switched, protected, and monitored via a bus system.

The power-level terminals are designed for use within the 24 V area of an Inline station.

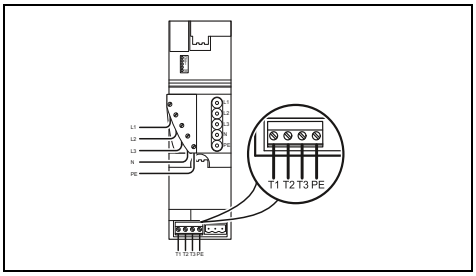
Features:

- Integrated electronic motor protection in accordance with IEC 60947-4
- Connection option for an external passive brake module
- Manual local operation
- Safe isolation between mains voltage and 24 V supply voltage according to EN 50178
- Diagnostic and status indicators
- Motor current monitoring
- Motor control via OUT process data



Electronic direct or reversing load starter, up to 1.5 kW/400 V AC

EAC



Technical data

Interface	
Inline local bus	Inline data jumper
Power supply for module electronics	
Communications power U_L	7.5 V
Current consumption from U_L	max. 45 mA
Motor starter, output	
Connection method	COMBICON
Output voltage range	200 V AC ... 400 V AC (50 Hz ... 60 Hz)
Nominal current range	0.2 A ... 3.6 A
Power factor	0.3
Switching rate	Max. 30 per minute (observe derating)
Motor monitoring	
Tripping class	Based on class 10 A of IEC 60947-4: 1990
Overspeed tripping	≥ 20 A (after 0.3 seconds)
Output	
Maximum switching voltage	-
Max. switching current	-
Switch-off delay	-
Switch-on delay	-
General data	
Connection method	Screw connection
Connection data solid/stranded/AWG Motor circuit connector	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Width	63 mm
EMC note	Class A product, see page 525

Ordering data

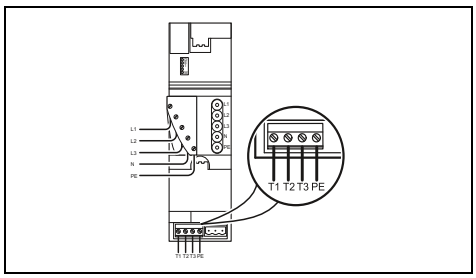
Description	Type	Order No.	Pcs./Pkt.
Inline power-level terminal blocks, incl. motor circuit connector			
- Electronic direct starter	**IB IL 400 ELR 1-3A**	2727352	1
- Electronic reversing load starter	**IB IL 400 ELR R-3A**	2727378	1
- Electromechanical direct starter			
Inline brake module, for brake control in connection with Inline power-level terminals - For 440 V AC/DC brakes			

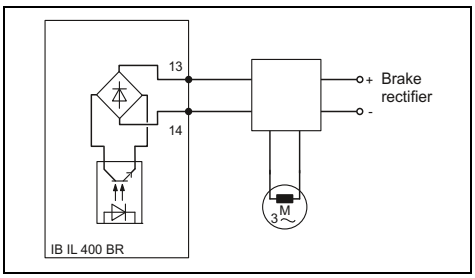
Accessories

Inline thermistor terminal, complete with accessories (connector and marking field)	**IB IL 24 TC-PAC**	2861360	1
Power plug for Inline power-level terminals	**IB IL 400 CN-PWR-IN**	2836078	1
Power bridge, for Inline power-level terminal blocks	**IB IL 400 CN-BRG**	2836081	1
Motor circuit connector for Inline power-level terminals	**GMVSTBW 2,5 HV/ 4-ST-7,62 NZIL**	1893957	10

Electromechanical direct starter, up to 3.7 kW / 400 V AC

Extension module, for brake control of power-level terminals





Technical data

Inline data jumper	-
7.5 V max. 45 mA	- -
COMBICON 200 V AC ... 600 V AC (50 Hz ... 60 Hz) 0.2 A ... 8 A 0.3 Max. 5 cycles per minute	- - - - -
Based on class 10 A of IEC 60947-4: 1990 ≥ 40 A (after 0.3 seconds)	- -
- - - -	440 V AC/DC 300 mA AC/DC < 1 ms < 4 ms
Screw connection 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16 63 mm Class A product, see page 525	- - 55 mm Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 400 MLR 1-8A	2727365	1

Type	Order No.	Pcs./Pkt.
IB IL 400 BR	2727394	1

Accessories

IB IL 24 TC-PAC	2861360	1
IB IL 400 CN-PWR-IN	2836078	1
IB IL 400 CN-BRG	2836081	1
GMVSTBW 2,5 HV/ 4-ST-7,62 NZIL	1893957	10

Accessories

Inline Block IO

Distributed I/O system with a block design

The space-saving extension to the modular Inline I/O system: compact and flat Inline Block IO modules.

Pre-assembled devices with a block design can be used to integrate a fixed number of I/Os into your network or bus system. Significant benefits can be achieved in terms of handling and costs for low numbers of I/Os in particular, as I/O modules and bus couplers are combined in a single device.

Your advantages:

– Particularly space saving: just 55 mm tall and 95 or 156 mm wide
– Manage low numbers of I/Os cost-effectively
– Time savings as no configuration is required and installation is easy
– Separate module, sensor, and actuator supply increases system availability

	Ordering data		
Description	Type	Order No.	Pcs./Pkt.
Inline Block IO digital I/O module for Modbus/TCP			
- 16 fixed inputs, 16 freely selectable inputs/outputs	**ILB ETH 24 DI16 DIO16-2TX**	2832962	1
Inline Block IO digital I/O module for PROFINET			
- 16 fixed inputs, 16 freely selectable inputs/outputs	**ILB PN 24 DI16 DIO16-EF**	2702289	1
Inline Block IO analog and digital I/O module and motion control for Sercos			
- 2 axes, drive control via speed setpoint, position detection with incremental signal from rotary/linear encoder	**ILB S3 24 DI8 DO4 AO2 INC-IN2**	2700174	1
Inline Block IO digital I/O module for CANopen®			
- 16 inputs, 16 outputs	**ILB CO 24 DI16 DO16**	2862592	1
Inline Block IO digital I/O module for DeviceNet™			
- 16 inputs, 16 outputs	**ILB DN 24 DI16 DO16**	2862602	1
Inline Block IO analog and digital I/O modules for INTERBUS			
- 32 inputs	**ILB IB 24 DI32**	2862343	1
- 16 outputs	**ILB IB 24 DO16**	2862356	1
- 32 outputs	**ILB IB 24 DO32**	2862369	1
- 16 inputs, 16 outputs	**ILB IB 24 DI16 DO16**	2862385	1
- 16 inputs, 16 outputs, D-SUB bus connection	**ILB IB 24 DI16 DO16-DSUB**	2878625	1
Inline Block IO analog and digital I/O modules for PROFIBUS			
- Eight inputs, eight inputs or outputs	**ILB PB 24 DI 8 DIO8**	2863562	1
- 16 inputs, 16 outputs	**ILB PB 24 DI16 DO16**	2862411	1
- 32 inputs	**ILB PB 24 DI32**	2862398	1

INTERBUS ST

Distributed I/O system with a modular design

INTERBUS ST (Smart Terminal) modules are used for medium to high numbers of I/Os – they connect sensors and actuators to INTERBUS, either distributed in the terminal box or centrally in the control cabinet.

Your advantages:

– Different connection methods increase flexibility when selecting the transmission medium
– Replaceable module electronics ensure reliable operation
– Adaptation to your individual needs, thanks to the modular design and connecting the modules as desired

Ordering data

Description	Type	Order No.	Pcs./Pkt.
INTERBUS ST BK modules			
- D-SUB connector, 9-pos.	**IBS ST 24 BK-T**	**2754341**	1
- MINI-COMBICON connector, 8-pos.	**IBS ST 24 BKM-T**	**2750154**	1
- Fiber optics F-SMA connector, optical path diagnostics	**IBS ST 24 BKM-LK-OPC**	**2728665**	1
- Additional remote bus branch, D-SUB connector	**IBS ST 24 BK RB-T**	**2753504**	1
- Additional local bus branch	**IBS ST 24 BK LB-T**	**2753232**	1
- D-SUB connector, 9-pos., 8 digital input and outputs each	**IBS ST 24 BK DIO 8/8/3-T**	**2752411**	1
INTERBUS ST digital modules			
- 16 inputs	**IB ST 24 DI 16/4**	**2754338**	1
- 32 inputs	**IB ST 24 DI32/2**	**2754927**	1
- 32 outputs	**IB ST 24 DO32/2**	**2754325**	1
- 16 relay N/O contact outputs	**IB ST 24 DO16R/S**	**2721112**	1
- Eight inputs, eight outputs, 2 A	**IB ST 24 DIO 8/8/3-2A**	**2753708**	1
INTERBUS ST analog modules			
- 4 inputs, 0 - 20 mA, 4 - 20 mA, 0 - 10 V, ±10 V	**IB ST 24 AI 4/EF**	**2700838**	1
- 8 inputs, 0 - 20 mA, 4 - 20 mA, 0 - 10 V, etc.	**IB ST 24 BAI 8/EF**	**2700842**	1
- 4 inputs, RTD, Pt 100, Pt 1000, etc.	**IB ST 24 TEMP 4 RTD**	**2700843**	1
- 4 outputs, 0 - 20 mA, 4 - 20 mA, 0 - 10 V	**IB ST 24 AO 4/EF**	**2700839**	1

Product overview

Axioline E I/O modules, metal, M12

	Digital input	Digital input/output			IO-Link
	16 channels	16 freely configurable channels	8/8 channels	8/4 channels	8 ports
EtherCAT	Page 192		Page 193		
EtherNet/IP	Page 194		Page 195		
Modbus/TCP (UDP)	Page 196		Page 197		
PROFINET	Page 198		Page 199		
sercos the automation bus	Page 200		Page 201		
PROFIBUS	Page 202		Page 203		

Axioline E I/O modules, plastic, M12

	Digital input	Digital input/output			IO-Link
	16 channels	16 freely configurable channels	8/8 channels	8/4 channels	8 ports
EtherCAT	Page 192		Page 193		
EtherNet/IP	Page 194		Page 195		
Modbus/TCP (UDP)	Page 196		Page 197		
PROFINET	Page 198		Page 199		
sercos the automation bus	Page 200		Page 201		
PROFIBUS	Page 202		Page 203		

Axioline E IO-Link devices, M12

IO-Link

Angled version

Analog input		Analog output		Temperature recording
1 channel Current input	1 channel Voltage input	1 channel Current output	1 channel Voltage output	1 channel RTD
Page 204		Page 205		

IO-Link

Straight version

Analog input		Analog output		Temperature recording
1 channel Current input	1 channel Voltage input	1 channel Current output	1 channel Voltage output	1 channel RTD
Page 204		Page 205		

General accessories

UCT-EM (7X10)

Snap-in markers, unmarked

phoenixcontact.net/products

SACB-4/T-L-8FUSE DIAG CT AXL

M12 distributor for power connectors

Page 206

SACC-M12...

M12 power connectors

SAC-4P...

M12 SPEEDCON power cable

Page 207

PROT-M12 SH

M12 screw plugs

phoenixcontact.net/products

General technical data

Ambient conditions

Temperature range (operation)	-25°C ... +60°C
Permissible humidity (storage/transport)	95%
Vibration	5g according to EN 60068-2-6/IEC 60068-2-6
Shock	30g according to EN 60068-2-27/IEC 60068-2-27
Continuous shock	10g according to EN 60068-2-27/IEC 60068-2-27
Degree of protection	IP65/IP67 according to IEC 60529

Electromagnetic compatibility

Noise emission	Class A according to DIN EN 55022

Supply voltage

Nominal value	24 V DC
Permissible range	18 V DC ... 31.2 V DC, including ripple

EtherCAT®
Digital I/O devices – Stand-Alone

The I/O devices with a block design are used to acquire and output various signals.

Features:

- Robust metal or plastic housing
- Seamless connection via M12 connectors
- SPEEDCON fast locking system
- Maximum current carrying capacity of the supply 12 A
- Diagnostic and status indicators
- Short-circuit and overload protection

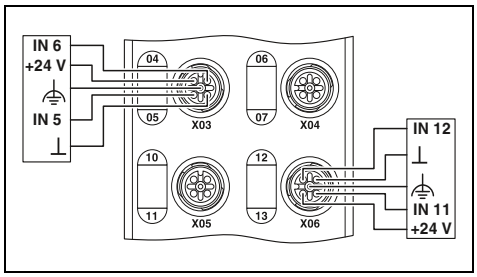
Additional features
IO-Link master:

- According to specification 1.1
- 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

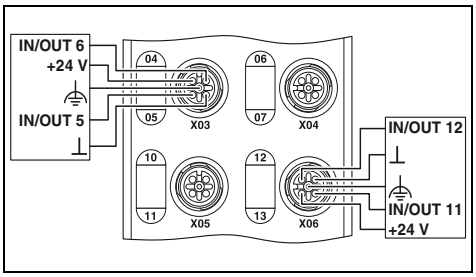
16 digital inputs

16 freely configurable inputs or outputs

EtherCAT
Ex:



EtherCAT
Ex:



		Technical data		Technical data	
		AXL E EC DI16 M12 6M	AXL E EC DI16 M12 6P	AXL E EC DIO16 M12 6M	AXL E EC DIO16 M12 6P
Interface					
Fieldbus system		EtherCAT®		EtherCAT®	
Connection method		M12 fast connection technology		M12 fast connection technology	
Transmission speed		100 Mbps (with auto negotiation)		100 Mbps (with auto negotiation)	
Power supply for module electronics					
Supply voltage		24 V DC		24 V DC	
Supply voltage range		18 V DC ... 31.2 V DC (including all tolerances, including ripple)		18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
Connection type		M12 connector (T-coded)		M12 connector (T-coded)	
Digital inputs					
Connection type		M12 connector, double occupancy		M12 connector, double occupancy	
Connection method		4-wire		4-wire	
Number of inputs		16		16	
Input filter time		< 1000 µs		< 1000 µs	
Protective circuit		Overload protection, short-circuit protection of sensor supply		Overload protection, short-circuit protection of sensor supply	
Digital outputs					
Connection type		-		M12 connector, double occupancy	
Connection method		3-wire	-	3-wire	
Number of outputs		-		16	
Maximum output current per channel		-		500 mA	
Protective circuit		-		Overload protection, short-circuit protection of outputs	
IO-Link ports					
Connection type		-		-	
Connection method		-		-	
Number of ports		-		-	
IO-Link port supply					
Nominal voltage for I/O supply		-		-	
Nominal current for every IO-Link port		-		-	
Protective circuit		-		-	
General data					
Weight		750 g	480 g	750 g	480 g
Drill hole spacing		198.5 mm		198.5 mm	
Dimensions	W / H / D	60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm	60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
Degree of protection		IP65/IP67		IP65/IP67	
Ambient temperature (operation)		-25 °C ... 60 °C		-25 °C ... 60 °C	
EMC note		Class A product, see page 525		Class A product, see page 525	

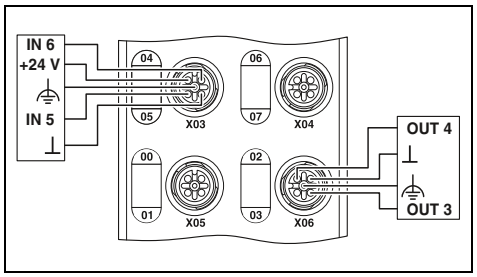
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Axioline E I/O device						
- Robust metal housing	**AXL E EC DI16 M12 6M**	2701526	1	**AXL E EC DIO16 M12 6M**	2701528	1
- Plastic housing	**AXL E EC DI16 M12 6P**	2701521	1	**AXL E EC DIO16 M12 6P**	2701522	1

8 digital inputs and 8 digital outputs

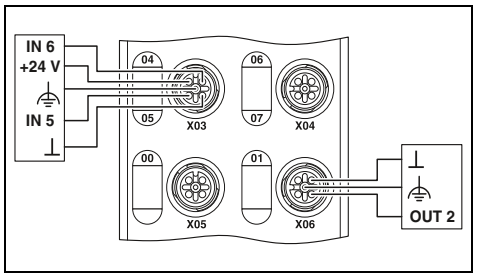
8 digital inputs and 4 digital outputs

8 IO-Link ports, 4 digital inputs

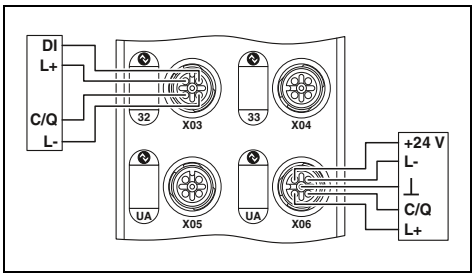
EtherCAT
Ex:



EtherCAT
Ex:



EtherCAT
Ex:



Technical data

AXL E EC DI8 DO8 M12 6M	AXL E EC DI8 DO8 M12 6P
EtherCAT® M12 fast connection technology 100 Mbps (with auto negotiation)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 connector (T-coded)	
M12 connector, double occupancy 4-wire 8 < 1000 µs Overload protection, short-circuit protection of sensor supply	
M12 connector, double occupancy 3-wire 8 500 mA Overload protection, short-circuit protection of outputs	
- - -	
- -	
-	
750 g	480 g
198.5 mm	
60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E EC DI8 DO8 M12 6M	2701525	1
AXL E EC DI8 DO8 M12 6P	2701520	1

Technical data

AXL E EC DI8 DO4 2A M12 6M	AXL E EC DI8 DO4 2A M12 6P
EtherCAT® M12 fast connection technology 100 Mbps (with auto negotiation)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 connector (T-coded)	
M12 connector, double occupancy 4-wire 8 < 1000 µs Overload protection, short-circuit protection of sensor supply	
M12 connector, (A-coded) 3-wire 4 2 A Overload protection, short-circuit protection of outputs	
- - -	
- -	
-	
750 g	480 g
198.5 mm	
60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E EC DI8 DO4 2A M12 6M	2701529	1
AXL E EC DI8 DO4 2A M12 6P	2701523	1

Technical data

AXL E EC IOL8 DI4 M12 6M	AXL E EC IOL8 DI4 M12 6P
EtherCAT® M12 fast connection technology 100 Mbps (with auto negotiation)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 connector (T-coded)	
- - - - -	
- - - - -	
M12 fast connection technology 3-wire 4	
- -	
24 V DC 150 mA (at C/Q (pin 4), maximum of 1.6 A over all 8 IO-Link C/Q and L+ cables) Overload protection Electronic	
750 g	480 g
198.5 mm	
60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E EC IOL8 DI4 M12 6M	2701531	1
AXL E EC IOL8 DI4 M12 6P	2701524	1

EtherNet/IP™
Digital I/O devices – Stand-Alone

The I/O devices with a block design are used to acquire and output various signals.

Features:

- Robust metal or plastic housing
- Seamless connection via M12 connectors
- SPEEDCON fast locking system
- Maximum current carrying capacity of the supply 12 A
- Diagnostic and status indicators
- Short-circuit and overload protection

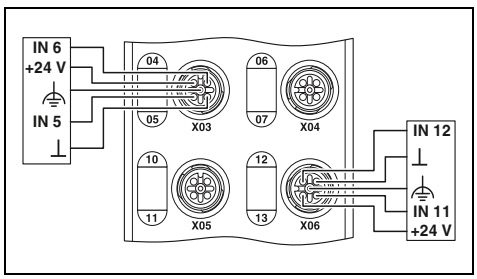
Additional features
IO-Link master:

- According to specification 1.1
- 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

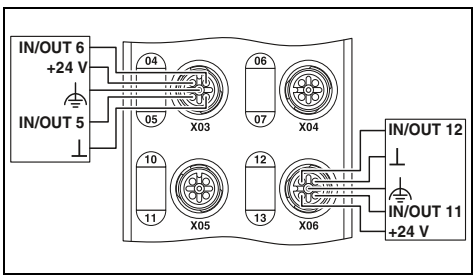
16 digital inputs

16 freely configurable inputs or outputs

Ex:



Ex:



Technical data

		AXL E EIP DI16 M12 6M	AXL E EIP DI16 M12 6P
Interface			
Fieldbus system		EtherNet/IP™	
Connection method		M12 fast connection technology	
Transmission speed		10/100 Mbps (with auto negotiation)	
Power supply for module electronics			
Supply voltage		24 V DC	
Supply voltage range		18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
Connection type		M12 connector (T-coded)	
Digital inputs			
Connection type		M12 connector, double occupancy	
Connection method		4-wire	
Number of inputs		16	
Input filter time		< 1000 µs	
Protective circuit		Overload protection, short-circuit protection of sensor supply	
Digital outputs			
Connection type		-	
Connection method		-	
Number of outputs		-	
Maximum output current per channel		-	
Protective circuit		-	
IO-Link ports			
Connection type		-	
Connection method		-	
Number of ports		-	
IO-Link port supply			
Nominal voltage for I/O supply		-	
Nominal current for every IO-Link port		-	
Protective circuit		-	
General data			
Weight		750 g	480 g
Drill hole spacing		198.5 mm	
Dimensions	W / H / D	60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
Degree of protection		IP65/IP67	
Ambient temperature (operation)		-25 °C ... 60 °C	
EMC note		Class A product, see page 525	

Technical data

		AXL E EIP DIO16 M12 6M	AXL E EIP DIO16 M12 6P
Interface			
Fieldbus system		EtherNet/IP™	
Connection method		M12 fast connection technology	
Transmission speed		10/100 Mbps (with auto negotiation)	
Power supply for module electronics			
Supply voltage		24 V DC	
Supply voltage range		18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
Connection type		M12 connector (T-coded)	
Digital inputs			
Connection type		M12 connector, double occupancy	
Connection method		4-wire	
Number of inputs		16	
Input filter time		< 1000 µs	
Protective circuit		Overload protection, short-circuit protection of sensor supply	
Digital outputs			
Connection type		M12 connector, double occupancy	
Connection method		3-wire	
Number of outputs		16	
Maximum output current per channel		500 mA	
Protective circuit		Overload protection, short-circuit protection of outputs	
IO-Link ports			
Connection type		-	
Connection method		-	
Number of ports		-	
IO-Link port supply			
Nominal voltage for I/O supply		-	
Nominal current for every IO-Link port		-	
Protective circuit		-	
General data			
Weight		750 g	480 g
Drill hole spacing		198.5 mm	
Dimensions	W / H / D	60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
Degree of protection		IP65/IP67	
Ambient temperature (operation)		-25 °C ... 60 °C	
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline E I/O device			
- Robust metal housing	**AXL E EIP DI16 M12 6M**	2701488	1
- Plastic housing	**AXL E EIP DI16 M12 6P**	2701493	1

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E EIP DIO16 M12 6M	2701489	1
AXL E EIP DIO16 M12 6P	2701494	1

EtherNet/IP

8 digital inputs and 8 digital outputs

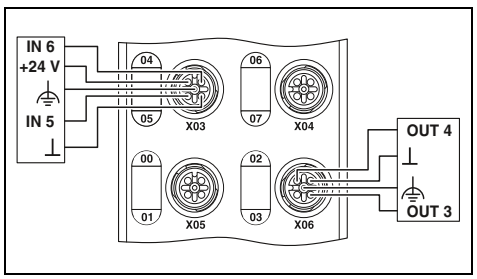
EtherNet/IP

8 digital inputs and 4 digital outputs

EtherNet/IP
IO-Link

8 IO-Link ports, 4 digital inputs

Ex:



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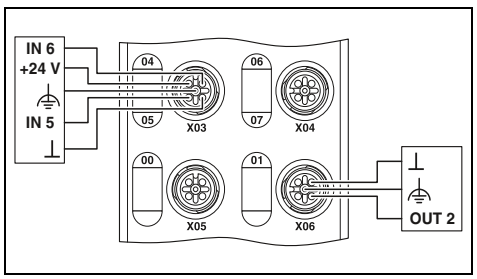

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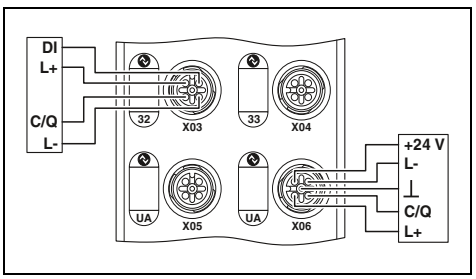


Technical data

AXL E EIP DI8 DO8 M12 6M	AXL E EIP DI8 DO8 M12 6P
EtherNet/IP™ M12 fast connection technology 10/100 Mbps (with auto negotiation)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple) M12 connector (T-coded)	
M12 connector, double occupancy 4-wire 8 < 1000 µs Overload protection, short-circuit protection of sensor supply	
M12 connector, double occupancy 3-wire 8 500 mA Overload protection, short-circuit protection of outputs	
- - -	
- - -	
750 g	480 g
198.5 mm	
60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E EIP DI8 DO8 M12 6M	2701487	1
AXL E EIP DI8 DO8 M12 6P	2701492	1

Technical data

AXL E EIP DI8 DO4 2A M12 6M	AXL E EIP DI8 DO4 2A M12 6P
EtherNet/IP™ M12 fast connection technology 10/100 Mbps (with auto negotiation)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple) M12 connector (T-coded)	
M12 connector, double occupancy 4-wire 8 < 1000 µs Overload protection, short-circuit protection of sensor supply	
M12 connector, (A-coded) 3-wire 4 2 A Overload protection, short-circuit protection of outputs	
- - -	
- - -	
750 g	480 g
198.5 mm	
60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E EIP DI8 DO4 2A M12 6M	2701490	1
AXL E EIP DI8 DO4 2A M12 6P	2701495	1

Technical data

AXL E EIP IOL8 DI4 M12 6M	AXL E EIP IOL8 DI4 M12 6P
EtherNet/IP™ M12 fast connection technology 10/100 Mbps (with auto negotiation)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple) M12 connector (T-coded)	
- - - - -	
- - - - -	
M12 fast connection technology 3-wire 4	
24 V DC 150 mA (at C/Q (pin 4), maximum of 1.6 A over all 8 IO-Link C/Q and L+ cables) Overload protection Electronic	
750 g	480 g
198.5 mm	
60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E EIP IOL8 DI4 M12 6M	2701491	1
AXL E EIP IOL8 DI4 M12 6P	2701496	1

Modbus/TCP
Digital I/O devices – Stand-Alone

The I/O devices with a block design are used to acquire and output various signals.

Features:

– Robust metal or plastic housing
– Seamless connection via M12 connectors
– SPEEDCON fast locking system
– Maximum current carrying capacity of the supply 12 A
– Diagnostic and status indicators
– Short-circuit and overload protection

Additional features
IO-Link master:

– According to specification 1.1
– 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

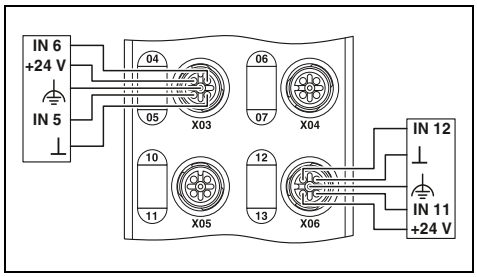
Modbus/TCP (UDP)

16 digital inputs

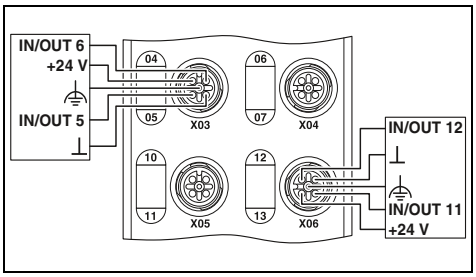
Modbus/TCP (UDP)

16 freely configurable inputs or outputs

Ex:



Ex:



		Technical data		Technical data	
		AXL E ETH DI16 M12 6M	AXL E ETH DI16 M12 6P	AXL E ETH DIO16 M12 6M	AXL E ETH DIO16 M12 6P
Interface					
Fieldbus system		Ethernet		Ethernet	
Connection method		M12 fast connection technology		M12 fast connection technology	
Transmission speed		10/100 Mbps (with auto negotiation)		10/100 Mbps (with auto negotiation)	
Power supply for module electronics					
Supply voltage		24 V DC		24 V DC	
Supply voltage range		18 V DC ... 31.2 V DC (including all tolerances, including ripple)		18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
Connection type		M12 connector (T-coded)		M12 connector (T-coded)	
Digital inputs					
Connection type		M12 connector, double occupancy		M12 connector, double occupancy	
Connection method		4-wire		4-wire	
Number of inputs		16		16	
Input filter time		< 1000 µs		< 1000 µs	
Protective circuit		Overload protection, short-circuit protection of sensor supply		Overload protection, short-circuit protection of sensor supply	
Digital outputs					
Connection type		-		M12 connector, double occupancy	
Connection method		-		3-wire	
Number of outputs		-		16	
Maximum output current per channel		-		500 mA	
Protective circuit		-		Overload protection, short-circuit protection of outputs	
IO-Link ports					
Connection type		-		-	
Connection method		-		-	
Number of ports		-		-	
IO-Link port supply					
Nominal voltage for I/O supply		-		-	
Nominal current for every IO-Link port		-		-	
Protective circuit		-		-	
General data					
Weight		750 g	480 g	750 g	480 g
Drill hole spacing		198.5 mm		198.5 mm	
Dimensions	W / H / D	60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm	60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
Degree of protection		IP65/IP67		IP65/IP67	
Ambient temperature (operation)		-25 °C ... 60 °C		-25 °C ... 60 °C	
EMC note		Class A product, see page 525		Class A product, see page 525	

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Axioline E I/O device						
- Robust metal housing	**AXL E ETH DI16 M12 6M**	2701538	1	**AXL E ETH DIO16 M12 6M**	2701539	1
- Plastic housing	**AXL E ETH DI16 M12 6P**	2701533	1	**AXL E ETH DIO16 M12 6P**	2701534	1

Modbus/TCP (UDP)

8 digital inputs and 8 digital outputs

Modbus/TCP (UDP)

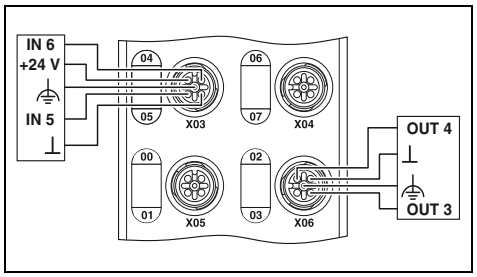
8 digital inputs and 4 digital outputs

Modbus/TCP (UDP)

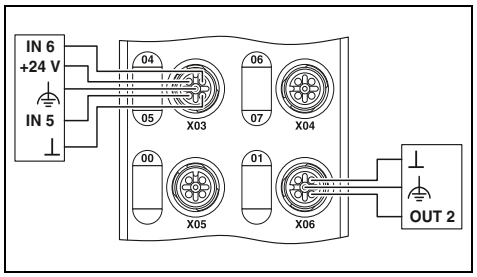
IO-Link

8 IO-Link ports, 4 digital inputs

Ex:



Ex:



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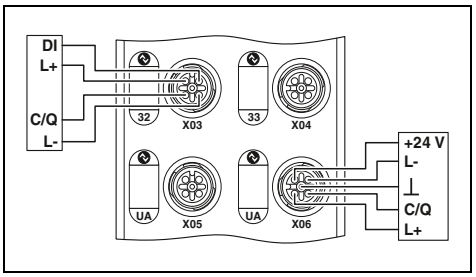


Technical data

AXL E ETH DI8 DO8 M12 6M	AXL E ETH DI8 DO8 M12 6P
Ethernet M12 fast connection technology 10/100 Mbps (with auto negotiation)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 connector (T-coded)	
M12 connector, double occupancy 4-wire 8 < 1000 µs Overload protection, short-circuit protection of sensor supply	
M12 connector, double occupancy 3-wire 8 500 mA Overload protection, short-circuit protection of outputs	
- - -	
- -	
-	
750 g	480 g
198.5 mm 60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
IP65/IP67 -25 °C ... 60 °C Class A product, see page 525	

Technical data

AXL E ETH DI8 DO4 2A M12 6M	AXL E ETH DI8 DO4 2A M12 6P
Ethernet M12 fast connection technology 10/100 Mbps (with auto negotiation)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 connector (T-coded)	
M12 connector, double occupancy 4-wire 8 < 1000 µs Overload protection, short-circuit protection of sensor supply	
M12 connector, (A-coded) 3-wire 4 2 A Overload protection, short-circuit protection of outputs	
- - -	
- -	
-	
750 g	480 g
198.5 mm 60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
IP65/IP67 -25 °C ... 60 °C Class A product, see page 525	

Technical data

AXL E ETH IOL8 DI4 M12 6M	AXL E ETH IOL8 DI4 M12 6P
Ethernet M12 fast connection technology 10/100 Mbps (with auto negotiation)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 connector (T-coded)	
- - - - -	
- - - - -	
M12 fast connection technology 3-wire 4	
24 V DC 150 mA (at C/Q (pin 4), maximum of 1.6 A over all 8 IO-Link C/Q and L+ cables) Overload protection Electronic	
750 g	480 g
198.5 mm 60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
IP65/IP67 -25 °C ... 60 °C Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E ETH DI8 DO8 M12 6M	**2701537**	1
AXL E ETH DI8 DO8 M12 6P	**2701532**	1

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E ETH DI8 DO4 2A M12 6M	**2701540**	1
AXL E ETH DI8 DO4 2A M12 6P	**2701535**	1

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E ETH IOL8 DI4 M12 6M	**2701541**	1
AXL E ETH IOL8 DI4 M12 6P	**2701536**	1

PROFINET
Digital I/O devices – Stand-Alone

The I/O devices with a block design are used to acquire and output various signals.

Features:

– Robust metal or plastic housing
– Seamless connection via M12 connectors
– SPEEDCON fast locking system
– Maximum current carrying capacity of the supply 12 A
– Diagnostic and status indicators
– Short-circuit and overload protection

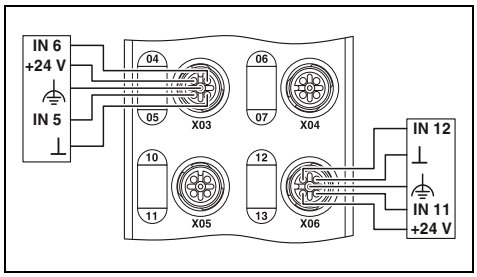
Additional features
IO-Link master:

– According to specification 1.1
– 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

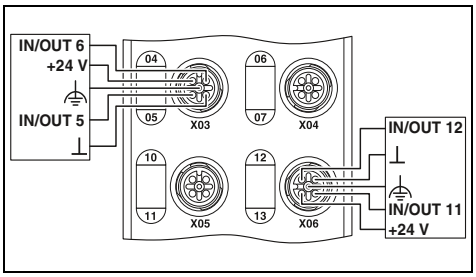
16 digital inputs

16 freely configurable inputs or outputs

Ex:



Ex:



		Technical data		Technical data	
		AXL E PN DI16 M12 6M	AXL E PN DI16 M12 6P	AXL E PN DIO16 M12 6M	AXL E PN DIO16 M12 6P
Interface					
Fieldbus system		PROFINET		PROFINET	
Connection method		M12 fast connection technology		M12 fast connection technology	
Transmission speed		100 Mbps (with auto negotiation)		100 Mbps (with auto negotiation)	
Power supply for module electronics					
Supply voltage		24 V DC		24 V DC	
Supply voltage range		18 V DC ... 31.2 V DC (including all tolerances, including ripple)		18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
Connection type		M12 connector (T-coded)		M12 connector (T-coded)	
Digital inputs					
Connection type		M12 connector, double occupancy		M12 connector, double occupancy	
Connection method		4-wire		4-wire	
Number of inputs		16		16	
Input filter time		< 1000 µs		< 1000 µs	
Protective circuit		Overload protection, short-circuit protection of sensor supply		Overload protection, short-circuit protection of sensor supply	
Digital outputs					
Connection type		-		M12 connector, double occupancy	
Connection method		-		3-wire	
Number of outputs		-		16	
Maximum output current per channel		-		500 mA	
Protective circuit		-		Overload protection, short-circuit protection of outputs	
IO-Link ports					
Connection type		-		-	
Connection method		-		-	
Number of ports		-		-	
IO-Link port supply					
Nominal voltage for I/O supply		-		-	
Nominal current for every IO-Link port		-		-	
Protective circuit		-		-	
General data					
Weight		750 g	480 g	750 g	480 g
Drill hole spacing		198.5 mm		198.5 mm	
Dimensions	W / H / D	60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm	60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
Degree of protection		IP65/IP67		IP65/IP67	
Ambient temperature (operation)		-25 °C ... 60 °C		-25 °C ... 60 °C	
EMC note		Class A product, see page 525		Class A product, see page 525	

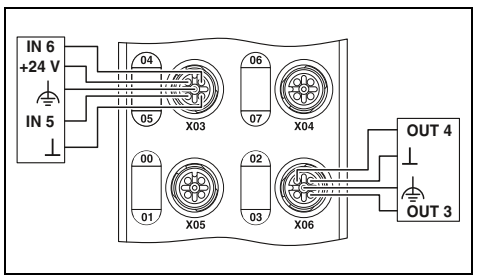
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Axioline E I/O device						
- Robust metal housing	**AXL E PN DI16 M12 6M**	2701516	1	**AXL E PN DIO16 M12 6M**	2701517	1
- Plastic housing	**AXL E PN DI16 M12 6P**	2701510	1	**AXL E PN DIO16 M12 6P**	2701511	1

8 digital inputs and 8 digital outputs

8 digital inputs and 4 digital outputs

8 IO-Link ports, 4 digital inputs

Ex:



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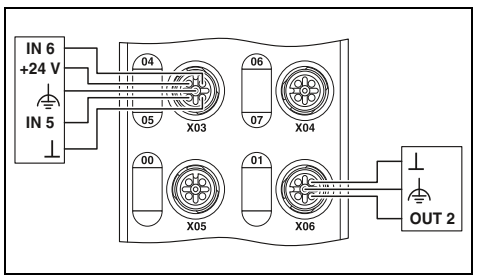

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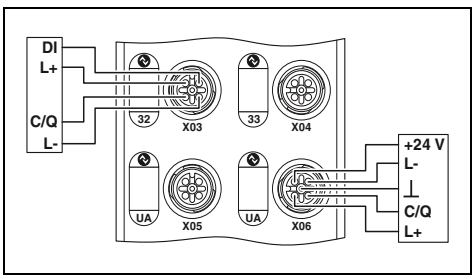


Technical data

AXL E PN DI8 DO8 M12 6M	AXL E PN DI8 DO8 M12 6P
PROFINET M12 fast connection technology 100 Mbps (with auto negotiation)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 connector (T-coded)	
M12 connector, double occupancy 4-wire 8 < 1000 µs Overload protection, short-circuit protection of sensor supply	
M12 connector, double occupancy 3-wire 8 500 mA Overload protection, short-circuit protection of outputs	
- - -	
- -	
-	
750 g	480 g
198.5 mm	
60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E PN DI8 DO8 M12 6M	2701515	1
AXL E PN DI8 DO8 M12 6P	2701509	1

Technical data

AXL E PN DI8 DO4 2A M12 6M	AXL E PN DI8 DO4 2A M12 6P
PROFINET M12 fast connection technology 100 Mbps (with auto negotiation)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 connector (T-coded)	
M12 connector, double occupancy 4-wire 8 < 1000 µs Overload protection, short-circuit protection of sensor supply	
M12 connector, (A-coded) 3-wire 4 2 A Overload protection, short-circuit protection of outputs	
- - -	
- -	
-	
750 g	480 g
198.5 mm	
60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E PN DI8 DO4 2A M12 6M	2701518	1
AXL E PN DI8 DO4 2A M12 6P	2701512	1

Technical data

AXL E PN IOL8 DI4 M12 6M	AXL E PN IOL8 DI4 M12 6P
PROFINET M12 fast connection technology 100 Mbps (with auto negotiation)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 connector (T-coded)	
- - - - -	
- - - - -	
M12 fast connection technology 3-wire 4	
- -	
24 V DC 150 mA (at C/Q (pin 4), maximum of 1.6 A over all 8 IO-Link C/Q and L+ cables) Overload protection Electronic	
750 g	480 g
198.5 mm	
60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E PN IOL8 DI4 M12 6M	2701519	1
AXL E PN IOL8 DI4 M12 6P	2701513	1

Sercos
Digital I/O devices – Stand-Alone

The I/O devices with a block design are used to acquire and output various signals.

Features:

- Robust metal or plastic housing
- Seamless connection via M12 connectors
- SPEEDCON fast locking system
- Maximum current carrying capacity of the supply 12 A
- Diagnostic and status indicators
- Short-circuit and overload protection

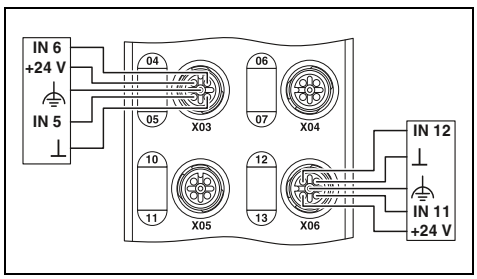
Additional features
IO-Link master:

- According to specification 1.1
- 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

16 digital inputs

16 freely configurable inputs or outputs

Ex:



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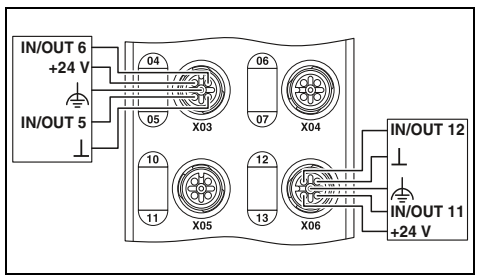


Technical data

		AXL E S3 DI16 M12 6M	AXL E S3 DI16 M12 6P
Interface			
Fieldbus system		Sercos	
Connection method		M12 fast connection technology	
Transmission speed		100 Mbps (with auto negotiation)	
Power supply for module electronics			
Supply voltage		24 V DC	
Supply voltage range		18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
Connection type		M12 connector (T-coded)	
Digital inputs			
Connection type		M12 connector, double occupancy	
Connection method		4-wire	
Number of inputs		16	
Input filter time		< 1000 µs	
Protective circuit		Overload protection, short-circuit protection of sensor supply	
Digital outputs			
Connection type		-	
Connection method		-	
Number of outputs		-	
Maximum output current per channel		-	
Protective circuit		-	
IO-Link ports			
Connection type		-	
Connection method		-	
Number of ports		-	
IO-Link port supply			
Nominal voltage for I/O supply		-	
Nominal current for every IO-Link port		-	
Protective circuit		-	
General data			
Weight		750 g	480 g
Drill hole spacing		198.5 mm	
Dimensions	W / H / D	60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
Degree of protection		IP65/IP67	
Ambient temperature (operation)		-25 °C ... 60 °C	
EMC note		Class A product, see page 525	

Technical data

		AXL E S3 DIO16 M12 6M	AXL E S3 DIO16 M12 6P
Interface			
Fieldbus system		Sercos	
Connection method		M12 fast connection technology	
Transmission speed		100 Mbps (with auto negotiation)	
Power supply for module electronics			
Supply voltage		24 V DC	
Supply voltage range		18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
Connection type		M12 connector (T-coded)	
Digital inputs			
Connection type		M12 connector, double occupancy	
Connection method		4-wire	
Number of inputs		16	
Input filter time		< 1000 µs	
Protective circuit		Overload protection, short-circuit protection of sensor supply	
Digital outputs			
Connection type		M12 connector, double occupancy	
Connection method		3-wire	
Number of outputs		16	
Maximum output current per channel		500 mA	
Protective circuit		Overload protection, short-circuit protection of outputs	
IO-Link ports			
Connection type		-	
Connection method		-	
Number of ports		-	
IO-Link port supply			
Nominal voltage for I/O supply		-	
Nominal current for every IO-Link port		-	
Protective circuit		-	
General data			
Weight		750 g	480 g
Drill hole spacing		198.5 mm	
Dimensions	W / H / D	60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
Degree of protection		IP65/IP67	
Ambient temperature (operation)		-25 °C ... 60 °C	
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline E I/O device			
- Robust metal housing	**AXL E S3 DI16 M12 6M**	2701549	1
- Plastic housing	**AXL E S3 DI16 M12 6P**	2701544	1

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E S3 DIO16 M12 6M	2701550	1
AXL E S3 DIO16 M12 6P	2701545	1

sercos the automation bus

8 digital inputs and 8 digital outputs

sercos the automation bus

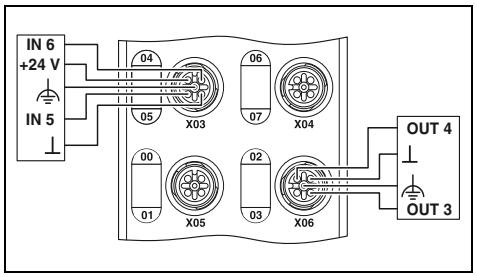
8 digital inputs and 4 digital outputs

sercos the automation bus

IO-Link

8 IO-Link ports, 4 digital inputs

Ex:



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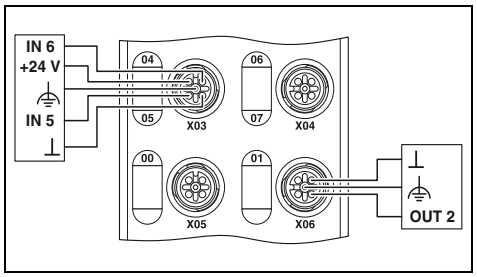

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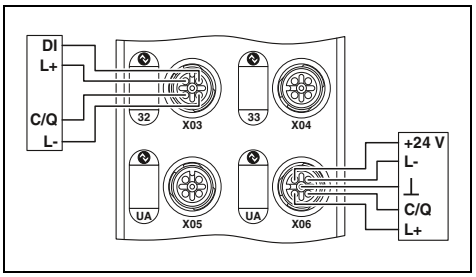


Technical data

AXL E S3 DI8 DO8 M12 6M	AXL E S3 DI8 DO8 M12 6P
Sercos M12 fast connection technology 100 Mbps (with auto negotiation)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 connector (T-coded)	
M12 connector, double occupancy 4-wire 8 < 1000 µs Overload protection, short-circuit protection of sensor supply	
M12 connector, double occupancy 3-wire 8 500 mA Overload protection, short-circuit protection of outputs	
- - -	
- -	
-	
750 g	480 g
198.5 mm	
60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E S3 DI8 DO8 M12 6M	2701548	1
AXL E S3 DI8 DO8 M12 6P	2701542	1

Technical data

AXL E S3 DI8 DO4 2A M12 6M	AXL E S3 DI8 DO4 2A M12 6P
Sercos M12 fast connection technology 100 Mbps (with auto negotiation)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 connector (T-coded)	
M12 connector, double occupancy 4-wire 8 < 1000 µs Overload protection, short-circuit protection of sensor supply	
M12 connector, (A-coded) 3-wire 4 2 A Overload protection, short-circuit protection of outputs	
- - -	
- -	
-	
750 g	480 g
198.5 mm	
60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E S3 DI8 DO4 2A M12 6M	2701551	1
AXL E S3 DI8 DO4 2A M12 6P	2701546	1

Technical data

AXL E S3 IOL8 DI4 M12 6M	AXL E S3 IOL8 DI4 M12 6P
Sercos M12 fast connection technology 100 Mbps (with auto negotiation)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 connector (T-coded)	
- - - - -	
- - - - -	
M12 fast connection technology 3-wire 4	
24 V DC 150 mA (at C/Q (pin 4), maximum of 1.6 A over all 8 IO-Link C/Q and L+ cables) Overload protection Electronic	
750 g	480 g
198.5 mm	
60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E S3 IOL8 DI4 M12 6M	2701552	1
AXL E S3 IOL8 DI4 M12 6P	2701547	1

PROFIBUS DP
Digital I/O devices – Stand-Alone

The I/O devices with a block design are used to acquire and output various signals.

Features:

– Robust metal or plastic housing
– Seamless connection via M12 connectors
– SPEEDCON fast locking system
– Maximum current carrying capacity of the supply 12 A
– Diagnostic and status indicators
– Short-circuit and overload protection

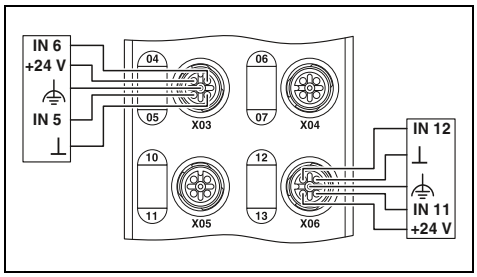
Additional features
IO-Link master:

– According to specification 1.1
– 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

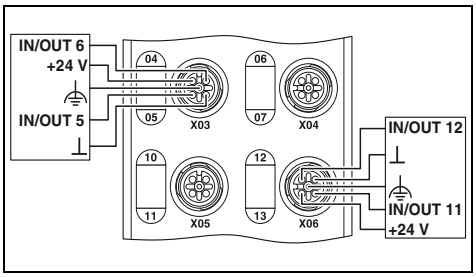
16 digital inputs

16 freely configurable inputs or outputs

Ex:



Ex:



Technical data

		AXL E PB DI16 M12 6M	AXL E PB DI16 M12 6P
Interface			
Fieldbus system		PROFIBUS DP	
Connection method		M12 fast connection technology	
Transmission speed		9.6 kbps ... 12 Mbps (Automatic baud rate detection)	
Power supply for module electronics			
Supply voltage		24 V DC	
Supply voltage range		18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
Connection type		M12 connector (T-coded)	
Digital inputs			
Connection type		M12 connector, double occupancy	
Connection method		4-wire	
Number of inputs		16	
Input filter time		< 1000 µs	
Protective circuit		Overload protection, short-circuit protection of sensor supply	
Digital outputs			
Connection type		-	
Connection method		-	
Number of outputs		-	
Maximum output current per channel		-	
Protective circuit		-	
IO-Link ports			
Connection type		-	
Connection method		-	
Number of ports		-	
IO-Link port supply			
Nominal voltage for I/O supply		-	
Nominal current for every IO-Link port		-	
Protective circuit		-	
General data			
Weight		750 g	480 g
Drill hole spacing		198.5 mm	
Dimensions	W / H / D	60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
Degree of protection		IP65/IP67	
Ambient temperature (operation)		-25 °C ... 60 °C	
EMC note		Class A product, see page 525	

Technical data

		AXL E PB DIO16 M12 6M	AXL E PB DIO16 M12 6P
Interface			
Fieldbus system		PROFIBUS DP	
Connection method		M12 fast connection technology	
Transmission speed		9.6 kbps ... 12 Mbps (Automatic baud rate detection)	
Power supply for module electronics			
Supply voltage		24 V DC	
Supply voltage range		18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
Connection type		M12 connector (T-coded)	
Digital inputs			
Connection type		M12 connector, double occupancy	
Connection method		4-wire	
Number of inputs		16	
Input filter time		< 1000 µs	
Protective circuit		Overload protection, short-circuit protection of sensor supply	
Digital outputs			
Connection type		M12 connector, double occupancy	
Connection method		3-wire	
Number of outputs		16	
Maximum output current per channel		500 mA	
Protective circuit		Overload protection, short-circuit protection of outputs	
IO-Link ports			
Connection type		-	
Connection method		-	
Number of ports		-	
IO-Link port supply			
Nominal voltage for I/O supply		-	
Nominal current for every IO-Link port		-	
Protective circuit		-	
General data			
Weight		750 g	480 g
Drill hole spacing		198.5 mm	
Dimensions	W / H / D	60 mm / 185 mm / 38 mm	60 mm / 185 mm / 30.5 mm
Degree of protection		IP65/IP67	
Ambient temperature (operation)		-25 °C ... 60 °C	
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Axioline E I/O device			
- Robust metal housing	**AXL E PB DI16 M12 6M**	2701505	1
- Plastic housing	**AXL E PB DI16 M12 6P**	2701498	1

Ordering data

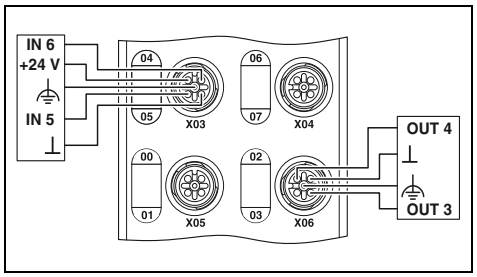
Type	Order No.	Pcs./Pkt.
AXL E PB DIO16 M12 6M	2701506	1
AXL E PB DIO16 M12 6P	2701499	1

8 digital inputs and 8 digital outputs

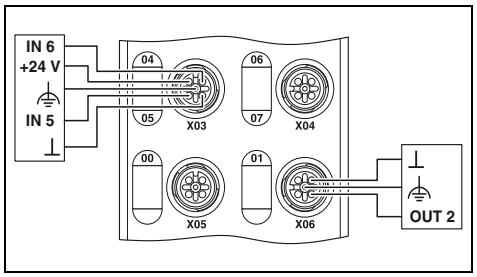
8 digital inputs and 4 digital outputs

8 IO-Link ports, 4 digital inputs

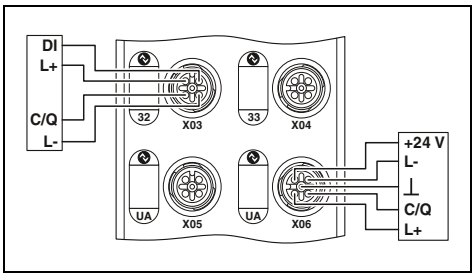
Ex:



Ex:



Ex:



Technical data

AXL E PB DI8 DO8 M12 6M	AXL E PB DI8 DO8 M12 6P
PROFIBUS DP M12 fast connection technology 9.6 kbps ... 12 Mbps (Automatic baud rate detection)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 connector (T-coded)	
M12 connector, double occupancy 4-wire 8 < 1000 µs Overload protection, short-circuit protection of sensor supply	
M12 connector, double occupancy 3-wire 8 500 mA Overload protection, short-circuit protection of outputs	
- - -	
- - -	
750 g 198.5 mm 60 mm / 185 mm / 38 mm IP65/IP67 -25 °C ... 60 °C Class A product, see page 525	480 g 60 mm / 185 mm / 30.5 mm

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E PB DI8 DO8 M12 6M	2701504	1
AXL E PB DI8 DO8 M12 6P	2701497	1

Technical data

AXL E PB DI8 DO4 2A M12 6M	AXL E PB DI8 DO4 2A M12 6P
PROFIBUS DP M12 fast connection technology 9.6 kbps ... 12 Mbps (Automatic baud rate detection)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 connector (T-coded)	
M12 connector, double occupancy 4-wire 8 < 1000 µs Overload protection, short-circuit protection of sensor supply	
M12 connector, (A-coded) 3-wire 4 2 A Overload protection, short-circuit protection of outputs	
- - -	
- - -	
750 g 198.5 mm 60 mm / 185 mm / 38 mm IP65/IP67 -25 °C ... 60 °C Class A product, see page 525	480 g 60 mm / 185 mm / 30.5 mm

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E PB DI8 DO4 2A M12 6M	2701507	1
AXL E PB DI8 DO4 2A M12 6P	2701502	1

Technical data

AXL E PB IOL8 DI4 M12 6M	AXL E PB IOL8 DI4 M12 6P
PROFIBUS DP M12 fast connection technology 9.6 kbps ... 12 Mbps (Automatic baud rate detection)	
24 V DC 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 connector (T-coded)	
- - - - -	
- - - - -	
M12 fast connection technology 3-wire 4	
24 V DC 150 mA (at C/Q (pin 4), maximum of 1.6 A over all 8 IO-Link C/Q and L+ cables) Overload protection Electronic	
750 g 198.5 mm 60 mm / 185 mm / 38 mm IP65/IP67 -25 °C ... 60 °C Class A product, see page 525	480 g 60 mm / 185 mm / 30.5 mm

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E PB IOL8 DI4 M12 6M	2701508	1
AXL E PB IOL8 DI4 M12 6P	2701503	1

IO-Link/analog converter

IO-Link/analog converters are used to convert analog input or output signals to the IO-Link interface. You can connect the converters directly in the field.

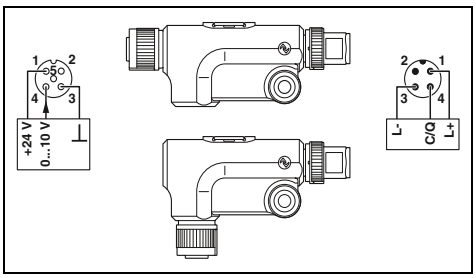
Features:
– Large variety of analog functions
– Tailored combination of analog functions
– High transmission reliability
– Reduced cabling

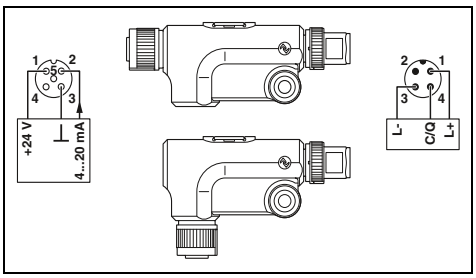
IO-Link

1 analog input (0 ... 10 V)

IO-Link

1 analog input (4 ... 20 mA)



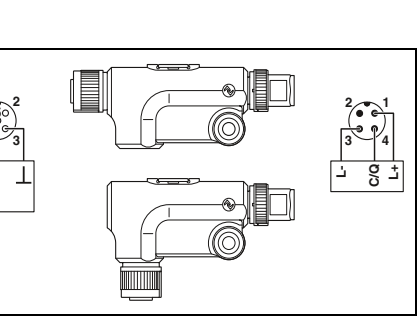


		Technical data		Technical data	
		AXL E IOL AI1 U M12 R	AXL E IOL AI1 U M12 S	AXL E IOL AI1 I M12 R	AXL E IOL AI1 I M12 S
IO-Link ports					
Connection type		M12 connector, A-coded		M12 connector, A-coded	
Connection method		3-wire		3-wire	
Number of ports		1		1	
IO-Link port supply					
Nominal voltage for I/O supply		24 V DC (This supply voltage is provided via the IO-Link interface of the IO-Link master.)		24 V DC (This supply voltage is provided via the IO-Link interface of the IO-Link master.)	
Nominal current for every IO-Link port		max. 100 mA		max. 100 mA	
Protective circuit		Reverse polarity protection Short-circuit protection Overload protection		Reverse polarity protection Short-circuit protection Overload protection	
Analog inputs					
Connection type		M12 connector, A-coded		M12 connector, A-coded	
Connection method		3-wire (optionally 4-wire)		3-wire	
Number of inputs		1 (voltage)		1 (current)	
Voltage input signal		0 V ... 10 V		-	
Current input signal		-		4 mA ... 20 mA	
Analog outputs					
Connection type		-		-	
Connection method		-		-	
Number of outputs		-		-	
Voltage output signal		-		-	
Current output signal		-		-	
Temperature input					
Connection type		-		-	
Connection method		-		-	
Number of inputs		-		-	
Sensor types (RTD) that can be used		-		-	
Linear resistance measuring range		-		-	
General data					
Weight		34 g		34 g	
Dimensions	W / H / D	16.6 mm / 42 mm / 66.5 mm	16.6 mm / 29 mm / 79.5 mm	16.6 mm / 42 mm / 66.5 mm	16.6 mm / 29 mm / 79.5 mm
Degree of protection		IP65/IP67		IP65/IP67	
Ambient temperature (operation)		-25 °C ... 60 °C		-25 °C ... 60 °C	
EMC note		Class A product, see page 525		Class A product, see page 525	

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
IO-Link/analog converter						
- Angled version	**AXL E IOL AI1 U M12 R**	2700273	1	**AXL E IOL AI1 I M12 R**	2700275	1
- Straight version	**AXL E IOL AI1 U M12 S**	2700336	1	**AXL E IOL AI1 I M12 S**	2700338	1

IO-Link

1 analog output (0 ... 10 V)



Technical data

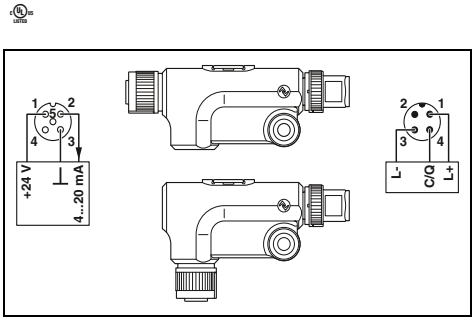
AXL E IOL AO1 U M12 R	AXL E IOL AO1 U M12 S
M12 connector, A-coded	
3-wire	
1	
24 V DC (This supply voltage is provided via the IO-Link interface of the IO-Link master.)	
max. 100 mA	
Reverse polarity protection	
Short-circuit protection	
Overload protection	
-	
-	
-	
-	
-	
M12 connector, A-coded	
3-wire	
1 (voltage)	
0 V ... 10 V	
-	
-	
-	
-	
-	
-	
34 g	
16.6 mm / 42 mm / 66.5 mm	16.6 mm / 29 mm / 79.5 mm
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E IOL AO1 U M12 R	**2700278**	1
AXL E IOL AO1 U M12 S	**2700350**	1

IO-Link

1 analog output (4 ... 20 mA)



Technical data

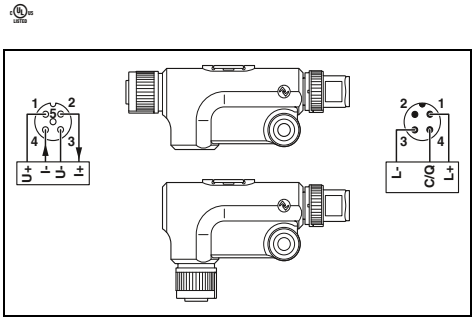
AXL E IOL AO1 I M12 R	AXL E IOL AO1 I M12 S
M12 connector, A-coded	
3-wire	
1	
24 V DC (This supply voltage is provided via the IO-Link interface of the IO-Link master.)	
max. 100 mA	
Reverse polarity protection	
Short-circuit protection	
Overload protection	
-	
-	
-	
-	
-	
M12 connector, A-coded	
3-wire	
1 (current)	
-	
4 mA ... 20 mA	
-	
-	
-	
-	
-	
34 g	
16.6 mm / 42 mm / 66.5 mm	16.6 mm / 29 mm / 79.5 mm
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E IOL AO1 I M12 R	**2700282**	1
AXL E IOL AO1 I M12 S	**2700351**	1

IO-Link

1 RTD input



Technical data

AXL E IOL RTD1 M12 R	AXL E IOL RTD1 M12 S
M12 connector, A-coded	
3-wire	
1	
24 V DC (This supply voltage is provided via the IO-Link interface of the IO-Link master.)	
-	max. 100 mA
Reverse polarity protection	
Short-circuit protection	
Overload protection	
-	
-	
-	
-	
-	
-	
-	
-	
-	
-	
M12 connector, A-coded	
3-wire (optionally 4-wire)	
1 (for resistance temperature detectors)	
Pt 100, Pt 1000	
0 Ω ... 500 Ω (IB IL format) / 0 Ω ... 5 kΩ (IB IL format) / 0 Ω ... 600 Ω (Format S7 compatible) / 0 Ω ... 6 kΩ (Format S7 compatible)	
34 g	
16.6 mm / 42 mm / 66.5 mm	16.6 mm / 29 mm / 79.5 mm
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
AXL E IOL RTD1 M12 R	**2700305**	1
AXL E IOL RTD1 M12 S	**2700352**	1

M12 power connector, screw connection

Further products related to the innovative M12 power cabling can be found on our website under web code:

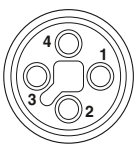
#0024

Metal knurl, 4-pos.

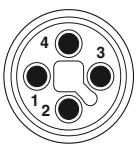
Y-distributor, T-coded, 4-pos.

	Technical data	Technical data
General data		
Degree of pollution	3	3
Degree of protection	IP67	IP65/IP67
Connection method	Screw connection	-
Connection cross section [mm²]	0.75 mm² ... 1.5 mm²	-
Electrical data		
Rated voltage	63 V DC	63 V DC
Rated current	12 A (when using 1.5 mm² conductors)	2x 12 A (at 40 °C)
Insulation resistance	> 10 GΩ	≥ 100 MΩ
Material data		
Material contact/contact surface	CuZn / Au	CuZn / Ni/Au
Contact carrier material	PA	PA
Flammability rating according to UL 94	V0	HB
Temperature data		
Plug/socket [°C]	-40 ... 85	-25 ... 80

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Connector, with **Pg11** screw connection, **cable diameter: 8 mm ... 10 mm**						
Socket, straight	**SACC-M12FST-3PECON-PG11-M**	1404644	1			
Connector, straight	**SACC-M12MST-3PECON-PG11-M**	1404643	1			
Socket, angled	**SACC-M12FRT-4CON-PG11-M**	1408989	1			
Connector, angled	**SACC-M12MRT-4CON-PG11-M**	1408988	1			
Y-distributor, M12-SPEEDCON, unshielded, M12 connector (T-coded) to 2 x M12 socket (T-coded)				**SAC-4PY-MT/2XFT VP**	1410632	5



Pin assignment of M12 socket, 4-pos., T-coded, socket side view



Connector pin assignment of M12 connector, 4-pos., T-coded, view of pin side

M12-SPEEDCON power cable, 4-pos., T-coded, cable type: PUR

	free end	M12 connector, SPEEDCON	

	Ordering data		Ordering data		Ordering data	
free end		**Order No.**		**Order No.**		**Order No.**
			1 m	1408812	1 m	1408816
			2 m	1408813	2 m	1408819
			5 m	1408814	5 m	1408820
			10 m	1408815	10 m	1408822
M12 socket, SPEEDCON, straight						
	1 m	1408823	1 m	1408808		
	2 m	1408824	2 m	1408809		
	5 m	1408825	5 m	1408810		
	10 m	1408826	10 m	1408811		
M12 socket, SPEEDCON, angled						
	1 m	1408827			1 m	1415196
	2 m	1408828			2 m	1415197
	5 m	1408829			5 m	1415198
	10 m	1408830			10 m	1415199

Cable description	Cable type
PUR, halogen-free - black	**PUR**

Color coding		Pin assignment
BN		1
WH		2
BK		4
BU		3

		Technical data
		M12
Rated voltage	[V]	63
Rated current	[A]	12
M12 material contact		CuZn
M12 material contact surface		Au
M12 material handle		TPU, hardly inflammable, self-extinguishing
Material, knurls		Zinc die-cast, nickel-plated
Degree of protection		IP65 / IP67
Temperature data		
Plug/socket	[°C]	-25 ... 85

Product overview

Bus couplers – modular

INTERBUS	PROFINET	PROFIBUS	EtherNet/IP	Ethernet
210	210	211	211	211

M12 I/O devices – modular

Digital input		Digital input/output			Digital output
8 channels	16 channels	4/4 channels	8/8 channels	16/16 channels	8 channels
212	212	213	213	213	213

Analog input	Analog output	Analog input
4 channels	4 channels	4 channels (RTD)
214	214	215

M8 I/O devices – modular

Digital input	Digital input/output	Digital output	
8 channels	8 channels	4 channels	8 channels
216	217	217	217

Accessories

FLM ADAP M12/M8
Fieldline Modular M12/M8 adapters
218

IB IL 24 FLM ...-PAC
Inline branch terminal
218

SAC-...2XM12...
Bus system T-distributor, M12
219

SAC-5P-M12MS ... TR
M12 termination resistor, PROFIBUS or DeviceNet™/CANopen®
219

SAC-3P-M12Y/2XM12FS PE
M12 Y-distributor
219

FLM MP...
Mounting plates
218

PROT-M12 / M8 ...
Sealing caps
219

ZBF 12 ... / ZBF 8 ...
Marking material
219

...
Bus and power cables with M12 connector
220

SAC-4P-M ...
Bus and power cables with M8 connector
222

SACC-M12... / SACC-M8...
M12/M8 connectors for assembly
223

General technical data

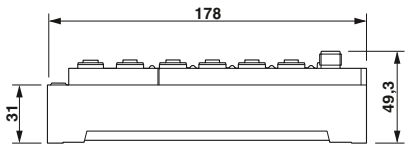
Ambient conditions	
Temperature range (operation)	-25°C ... +60°C
Permissible humidity (storage/transport)	95%
Vibration	5g according to EN 60068-2-6
Shock	30g according to EN 60068-2-27
Degree of protection	IP65/IP67 according to IEC 60529

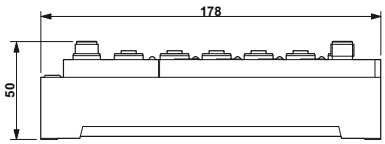
Electromagnetic compatibility	
Noise emission	Class A according to DIN EN 55022

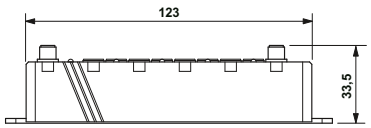
Supply voltage	
Nominal value	24 V DC
Permissible range	19.2 V DC ... 30.0 V DC, including ripple

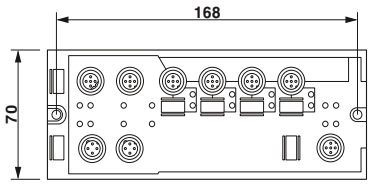
Housing types and dimensions

Bus coupler	M12 I/O devices	M8 I/O devices









Bus couplers – Modular

The bus couplers open a high-performance local bus with up to 16 devices.

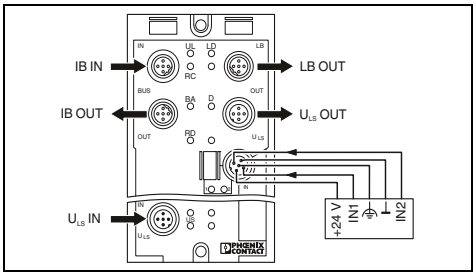
The following protocols are supported:
– INTERBUS
– PROFINET
– PROFIBUS
– EtherNet/IP™
– Modbus/TCP

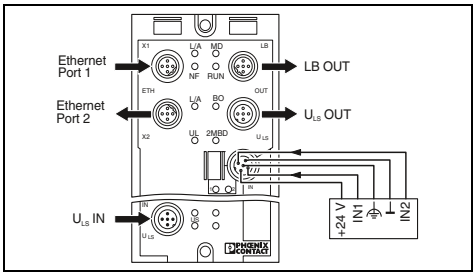
Notes:
A comprehensive range of installation materials for field installation can be found on page 218

INTERBUS

PROFINET

Ex:





		Technical data	Technical data
Interface			
Fieldbus system		INTERBUS	PROFINET
Connection method		M12 connector, B-coded	M12 connector, D-coded
Number of positions		5	4
Transmission speed		500 kbps / 2 Mbps (can be switched)	100 Mbps, auto negotiation
Power supply for module electronics			
Supply voltage		24 V DC	24 V DC
Connection method		M12 connector	M12 connector
Supply voltage range		18 V DC ... 30 V DC (including ripple)	18 V DC ... 30 V DC (including ripple)
Local bus gateway			
Transmission speed		500 kBaud/2 Mbaud, can be selected	500 kBaud/2 Mbaud, can be selected
Connection method		M12 connector, B-coded	M12 connector, B-coded
Max. number of local bus devices		16	16
Max. length of local bus		20 m	20 m
Digital inputs			
Connection type		M12 connector	M12 connector
Connection method		2, 3, 4-wire	2, 3, 4-wire
Number of inputs		8 (double-occupancy)	8 (EN 61131-2 type 1)
Filter time		3 ms	3 ms
Input characteristic curve		IEC 61131-2 type 1	IEC 61131-2 type 1
Protective circuit		Reverse polarity protection	Reverse polarity protection
General data			
Weight		280 g	280 g
Drill hole spacing		168 mm	168 mm
Dimensions	W / H / D	70 mm / 178 mm / 50 mm	70 mm / 178 mm / 50 mm
Degree of protection		IP65/IP67	IP65/IP67
Ambient temperature (operation)		-25 °C ... 60 °C	-25 °C ... 55 °C
EMC note		Class A product, see page 525	Class A product, see page 525

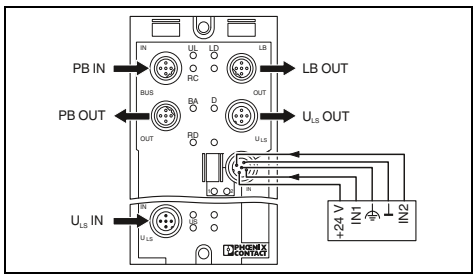
	Ordering data			Ordering data		
Description	**Type**	**Order No.**	Pcs./Pkt.	**Type**	**Order No.**	Pcs./Pkt.
Fieldline Modular M12 bus coupler						
	FLM BK IB M12 DI 8 M12	2736301	1	**FLM BK PN M12 DI 8 M12-2TX**	2736741	1

PROFIBUS

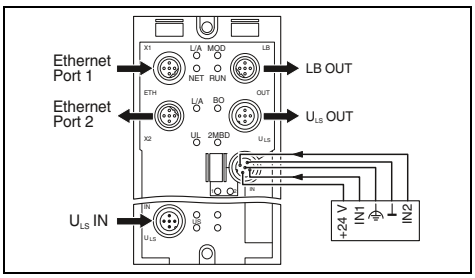
EtherNet/IP™

Modbus/TCP

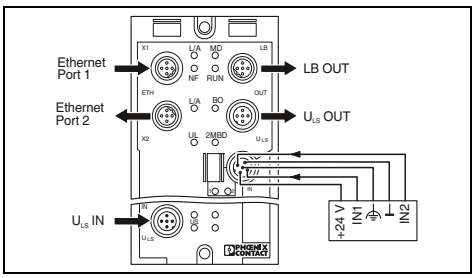
Ex:



Ex:



Ex:



Technical data

PROFIBUS DP
M12 connector, B-coded
5
9.64 kBaud to 12 Mbaud automatic detection

24 V DC
M12 connector
18 V DC ... 30 V DC (including ripple)

500 kBaud/2 Mbaud, can be selected
M12 connector, B-coded
16
20 m

M12 connector
2, 3, 4-wire
8 (double-occupancy)
3 ms
IEC 61131-2 type 1
Reverse polarity protection

280 g
168 mm
70 mm / 178 mm / 50 mm
IP65/IP67
-25 °C ... 60 °C
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FLM BK PB M12 DI 8 M12-EF	2773377	1

Technical data

EtherNet/IP™
M12 connector, D-coded
4
10/100 Mbps, auto negotiation

24 V DC
M12 connector
18 V DC ... 30 V DC (including ripple)

500 kBaud/2 Mbaud, can be selected
M12 connector, B-coded
16
20 m

M12 connector
2, 3, 4-wire
8 (EN 61131-2 type 1)
3 ms
IEC 61131-2 type 1
Reverse polarity protection

280 g
178 mm
70 mm / 178 mm / 50 mm
IP65/IP67
-25 °C ... 60 °C
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FLM BK EIP M12 DI 8 M12-2TX	2773322	1

Technical data

Ethernet
M12 connector, D-coded
4
10/100 Mbps, auto negotiation

24 V DC
M12 connector
18 V DC ... 30 V DC (including ripple)

500 kBaud/2 Mbaud, can be selected
M12 connector, B-coded
16
20 m

M12 connector
2, 3, 4-wire
8 (EN 61131-2 type 1)
3 ms
IEC 61131-2 type 1
Reverse polarity protection

280 g
178 mm
70 mm / 178 mm / 50 mm
IP65/IP67
-25 °C ... 60 °C
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FLM BK ETH M12 DI 8 M12-2TX	2736916	1

Digital I/O devices M12 – Modular

Notes:

A comprehensive range of installation materials for field installation can be found on page 218

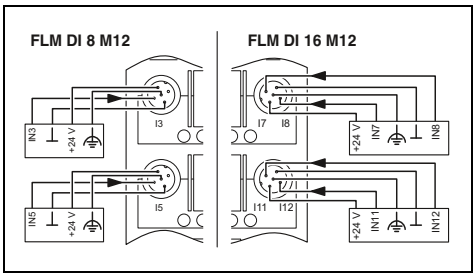
The local bus devices are used to acquire and output digital signals in a Fieldline Modular station.

Features:

– Seamless connection via M12 connectors
– SPEEDCON fast locking system
– Flexible power supply concept
– Diagnostic and status indicators
– Short-circuit and overload protection

8/16 digital inputs

Ex:



Technical data

		FLM DI 8 M12	FLM DI 16 M12
Interface			
Designation		Fieldline local bus	
Connection type		M12 connector, B-coded	
Transmission speed		500 kbps / 2 Mbps (can be switched)	500 kbps / 2 Mbps
Power supply for module electronics			
Supply voltage		24 V DC	
Connection method		M12 connector	
Supply voltage range		18 V DC ... 30 V DC (including ripple)	
Digital inputs			
Connection type		M12 connector	
Connection method		2, 3, 4-wire	
Number of inputs		8	16
Filter time		3 ms	
Input characteristic curve		IEC 61131-2 type 1	
Protective circuit		Reverse polarity protection	
Digital outputs			
Connection type		-	
Connection method		-	
Number of outputs		-	
Maximum output current per channel		-	
Protective circuit		-	
General data			
Weight		290 g	310 g
Drill hole spacing		168 mm	
Dimensions	W / H / D	70 mm / 178.5 mm / 50 mm	70 mm / 178 mm / 50 mm
Degree of protection		IP65/IP67	
Ambient temperature (operation)		-25 °C ... 60 °C	
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Fieldline Modular M12 digital input device			
- 8 inputs	**FLM DI 8 M12**	**2736288**	1
- 16 inputs	**FLM DI 16 M12**	**2736835**	1
Fieldline Modular M12 digital I/O device			
- 4 inputs, 4 outputs, 2 A			
- 8 inputs, 8 outputs			
- 16 inputs, 16 outputs			
Fieldline Modular M12 digital output device			
- 8 outputs			

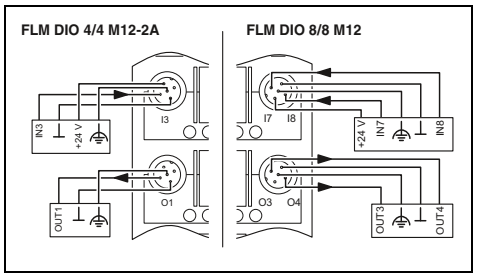
4/8 digital inputs and 4/8 digital outputs

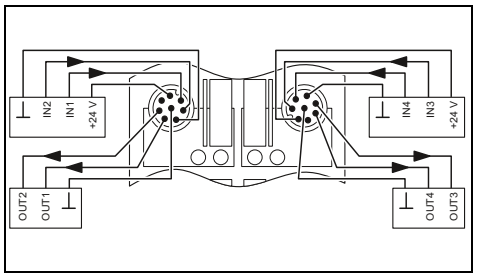
16 digital inputs, 16 digital outputs, and extended diagnostics

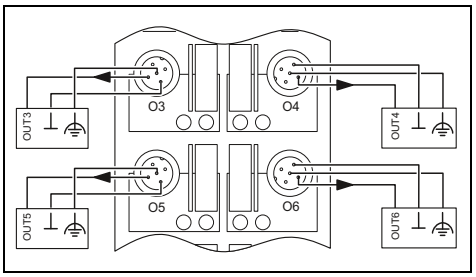
8 digital outputs

Ex:

Ex:







Technical data

FLM DIO 4/4 M12-2A	FLM DIO 8/8 M12
Fieldline local bus	
M12 connector, B-coded	
500 kbps / 2 Mbps (can be switched)	500 kbps / 2 Mbps
24 V DC	
M12 connector	
18 V DC ... 30 V DC (including ripple)	
M12 connector	
2, 3, 4-wire	
4	8
3 ms	
IEC 61131-2 type 1	
Reverse polarity protection	
M12 connector	
2, 3-wire	
4	8
2 A	500 mA
Short-circuit protection	
315 g	330 g
168 mm	
70 mm / 178 mm / 50 mm	
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Technical data

Fieldline local bus
M12 connector, B-coded
500 kbps / 2 Mbps
24 V DC
M12 connector
18 V DC ... 30 V DC (including ripple)
M12 connector, 8-pos.
2, 3-wire
16
3 ms
IEC 61131-2 type 1
Reverse polarity protection
M12 connector, 8-pos.
2-wire
16
500 mA
Short-circuit protection, overload protection of the sensor supply
400 g
168 mm
70 mm / 178 mm / 50 mm
IP65/IP67
-25 °C ... 60 °C
Class A product, see page 525

Technical data

Fieldline local bus
M12 connector, B-coded
500 kbps / 2 Mbps (can be switched)
24 V DC
M12 connector
18 V DC ... 30 V DC (including ripple)
-
-
-
-
-
-
M12 connector
2, 3-wire
8
500 mA
Short-circuit protection
310 g
168 mm
70 mm / 178 mm / 50 mm
IP65/IP67
-25 °C ... 60 °C
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FLM DIO 4/4 M12-2A	2736369	1
FLM DIO 8/8 M12	2736848	1

Ordering data

Type	Order No.	Pcs./Pkt.
FLM DIO 16/16 M12/8-DIAG	2736738	1

Ordering data

Type	Order No.	Pcs./Pkt.
FLM DO 8 M12	2736291	1

M12 analog I/O devices – Modular

The local bus devices are used to acquire and output analog signals in a Fieldline Modular station.

Features:

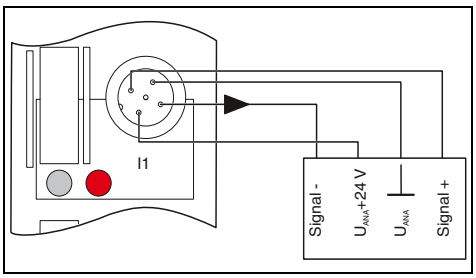
– Seamless connection via M12 connectors
– SPEEDCON fast locking system
– Flexible power supply concept
– Diagnostic and status indicators
– Short-circuit and overload protection

Notes:

A comprehensive range of installation materials for field installation can be found on page 218

4 analog inputs

Ex:



Technical data

Interface		
Designation		Fieldline local bus
Connection method		M12 connector, B-coded
Transmission speed		500 kbps / 2 Mbps
Power supply for module electronics		
Supply voltage		24 V DC
Supply voltage range		18 V DC ... 30 V DC (including ripple)
Analog inputs		
Connection method		2, 4-conductor
Number of inputs		max. 4 (differential inputs, voltage or current)
Voltage input signal		0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
Current input signal		0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Sensor types (RTD) that can be used		-
Protective circuit for voltage input		Reverse polarity protection
Process data update		-
Analog outputs		
Connection method		-
Number of outputs		-
Voltage output signal		-
Current output signal		-
Protective circuit		-
General data		
Connection method		M12 connector
Weight		280 g
Drill hole spacing		168 mm
Dimensions	W / H / D	70 mm / 178 mm / 50 mm
Degree of protection		IP65/IP67
Ambient temperature (operation)		-25 °C ... 60 °C
EMC note		Class A product, see page 525

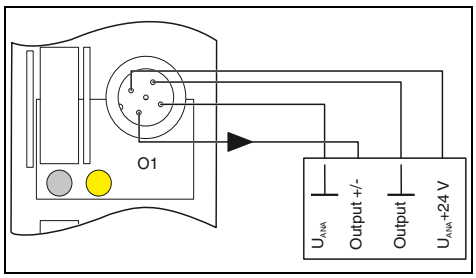
Ordering data

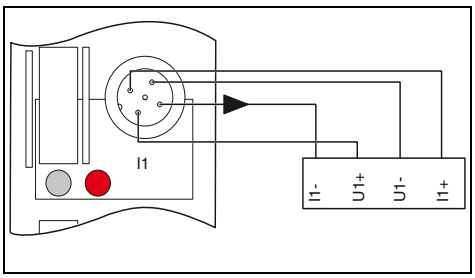
Description	Type	Order No.	Pcs./Pkt.
Fieldline Modular M12 analog input device			
- 4 inputs	**FLM AI 4 SF M12**	2736453	1
Fieldline Modular M12 analog output device			
- 4 outputs			

4 analog outputs

4 temperature inputs for resistive sensors

Ex:





Technical data

Fieldline local bus	Fieldline local bus
M12 connector, B-coded	M12 connector, B-coded
500 kbps / 2 Mbps	500 kbps / 2 Mbps
24 V DC	24 V DC
18 V DC ... 30 V DC (including ripple)	18 V DC ... 30 V DC (including ripple)
-	2, 3, 4-wire (shielded)
-	max. 4 (for resistance temperature detectors)
-	-
-	-
-	Pt, Ni, KTY sensors, linear resistors
-	-
-	Dependent on the connection method
2, 4-conductor	-
4	-
0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V	-
0 mA ... 20 mA / 4 mA ... 20 mA	-
Short-circuit protection	-
M12 connector	M12 connector
280 g	280 g
168 mm	168 mm
70 mm / 178 mm / 50 mm	70 mm / 178 mm / 50 mm
IP65/IP67	IP65/IP67
-25 °C ... 60 °C	-25 °C ... 60 °C
Class A product, see page 525	Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FLM AO 4 SF M12	2736466	1

Ordering data

Type	Order No.	Pcs./Pkt.
FLM TEMP 4 RTD M12	2736819	1

Digital I/O devices M8 – Modular

The slim local bus devices are particularly suitable for use on machines close to the process.

Features:

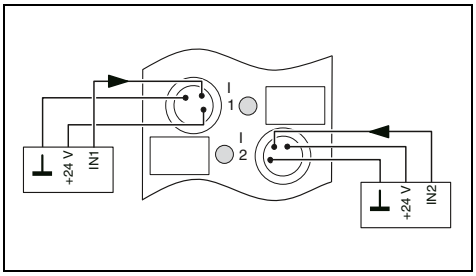
– Seamless connection via M8 connectors
– Optimized for 30 mm mounting profile
– Can also be connected to an Inline station
– Diagnostic and status indicators
– Short-circuit and overload protection

Notes:

A comprehensive range of installation materials for field installation can be found on page 218

8 digital inputs

Ex: c UL us



Technical data

Interface		
Designation		Fieldline local bus
Connection method		M8 connector
Power supply for module electronics		
Supply voltage		24 V DC
Connection method		M8 connector
Supply voltage range		18 V DC ... 30 V DC (including ripple)
Digital inputs		
Connection method		M8 connector
Connection method		2, 3-wire
Number of inputs		8
Filter time		3 ms
Input characteristic curve		IEC 61131-2 type 1
Protective circuit		Reverse polarity protection
Digital outputs		
Connection method		-
Connection method		-
Number of outputs		-
Maximum output current per channel		-
Protective circuit		-
General data		
Weight		137 g
Drill hole spacing		133 mm
Dimensions	W / H / D	29.8 mm / 143 mm / 26.5 mm
Degree of protection		IP65/IP67
Ambient temperature (operation)		-25 °C ... 60 °C
EMC note		Class A product, see page 525

Ordering data

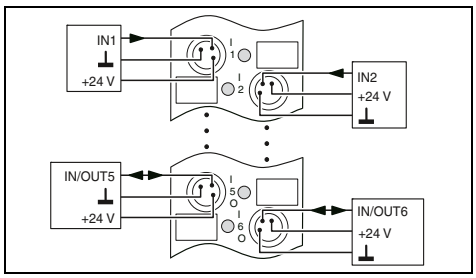
Description	Type	Order No.	Pcs./Pkt.
Fieldline Modular M8 digital input device			
- 8 inputs, 500 kBD	**FLM DI 8 M8**	2773348	1
Fieldline Modular M8 digital I/O device			
- 4 inputs fixed, 4 inputs/outputs freely selectable, 500 kBD			
Fieldline Modular M8 digital output device			
- 4 outputs, 2 A, 500 kBD			
- 8 outputs, 500 kBD			

4 digital inputs and 4 digital inputs or outputs

4 digital outputs

8 digital outputs

Ex:



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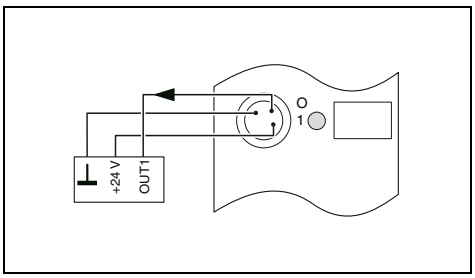
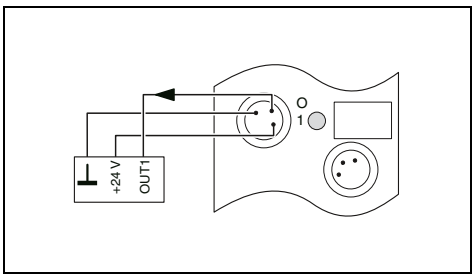




Technical data

Fieldline local bus	
M8 connector	
24 V DC	
M8 connector	
18 V DC ... 30 V DC (including ripple)	
M8 connector	-
2, 3-wire	-
8 (4 fixed, 4 freely selectable)	-
3 ms	-
IEC 61131-2 type 1	-
Reverse polarity protection	-
M8 connector	
2, 3-wire	
4 (Can also be used as an input)	
500 mA	
Short-circuit protection	
144 g	
133 mm	
29.8 mm / 143 mm / 26.5 mm	
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Technical data

Fieldline local bus	
2 M8 connector	
24 V DC	
M8 connector	
18 V DC ... 30 V DC (including ripple)	
-	
-	
-	
-	
-	
-	
M8 connector	
2, 3-wire	
4	
2 A	
Short-circuit protection	
137 g	
133 mm	
29.8 mm / 143 mm / 26.5 mm	
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Technical data

Fieldline local bus	
M8 connector	
24 V DC	
M8 connector	
18 V DC ... 30 V DC (including ripple)	
-	
-	
-	
-	
-	
-	
M8 connector	
2, 3-wire	
8	
500 mA	
Short-circuit protection	
137 g	
133 mm	
29.8 mm / 143 mm / 26.5 mm	
IP65/IP67	
-25 °C ... 60 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FLM DIO 8/4 M8	2773351	1

Ordering data

Type	Order No.	Pcs./Pkt.
FLM DO 4 M8-2A	2736932	1

Ordering data

Type	Order No.	Pcs./Pkt.
FLM DO 8 M8	2736893	1

Coupling options

Various adapters are available for connecting two systems.
– Connection of Fieldline Modular M8 to Fieldline Modular M12
– Connection of Fieldline Modular M8 or M12 to the Inline I/O system

Fieldline Modular M12/M8 adapter

Inline branch terminal

	Technical data	Technical data
Local bus interface		
Interface	Fieldline Modular M12 local bus	Fieldline Modular M8 local bus
Connection method	M12 connector, B-coded	Inline shield plug
Local bus interface		
Interface	Fieldline Modular M8 local bus	Inline local bus
Connection method	2 M8 connector	Inline data jumper

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Adapter piece for coupling Fieldline Modular M8 local bus devices to a Fieldline Modular M12 local bus	**FLM ADAP M12/M8**	2736961	1			
Inline Modular branch terminal for coupling one Fieldline Modular M8 local bus at the end of an Inline station				**IB IL 24 FLM-PAC**	2736903	1
Inline Modular branch terminal for coupling one Fieldline Modular M8 local bus to any location on each Inline station				**IB IL 24 FLM MULTI-PAC**	2737009	1

Mounting plates

Up to seven Fieldline Modular M12 devices can be mounted on the mounting plates.

For 5 Fieldline Modular devices

For 7 Fieldline Modular devices

	Technical data	Technical data
General data		
Width	360 mm	502 mm
Depth	11 mm	11 mm
Height	185 mm	185 mm
Hole diameter	8.5 mm	8.5 mm
Note on dimensions	For fastening the mounting plate	For fastening the mounting plate
Assembly instructions	For mounting 5 Fieldline Modular devices	For mounting 7 Fieldline Modular devices
Material	Chromated aluminum	Chromated aluminum
Weight	650 g	900 g

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Fieldline Modular mounting plate - For five Fieldline Modular M12 devices	**FLM MP 5**	2736660	1			
- For seven Fieldline Modular M12 devices				**FLM MP 7**	2736673	1

System components

Various system components with M12 connectors enable the easy creation of different topologies.
– T-distributor
– Termination resistors
– Y-distributors for power and signal connections

Distributors and termination resistors

Description	Ordering data		
	Type	Order No.	Pcs./Pkt.
Bus system T-distributor, 5-pos., M12			
- PROFIBUS	**SAC-M12T/2XM12 PBDP**	1458884	1
- DeviceNet™/CANopen®	**SAC-5P-M12T/2XM12 VP**	1541186	1
Termination resistor, M12 connector			
- PROFIBUS	**SAC-5P-M12MS PB TR**	1507803	5
- DeviceNet™/CANopen®	**SAC-5P-M12MS CAN TR**	1507816	5
Power cable, 4-pos., PUR/PVC black, straight Y plug M12 on 2x straight socket M12, length: 0.3 m	**SAC-4P-M12Y/2X0,3-PUR/M12FS VP**	1510722	1
M12 Y-distributor			
M12 connector to 2x M12 sockets	**SAC-3P-M12Y/2XM12FS PE**	1683455	5

Installation material

– Sealing caps with external or inner thread
– Printed marking labels or marking labels without color print

Sealing caps and marking material

Description	Ordering data		
	Type	Order No.	Pcs./Pkt.
M12 screw plug			
for unused M12 sockets of sensor/actuator cables, boxes, and device connectors	**PROT-M12**	1680539	5
As above, with SPEEDCON fast locking system	**PROT-MS SCO**	1553129	5
for unused M12 connectors of sensor/actuator cables, device connectors, and I/O devices in the field	**PROT-M12 FS**	1560251	5
M8 screw plug			
for unused M8 sockets of sensor/actuator cables, boxes, and device connectors	**PROT-M8**	1682540	5
Zack marker strip, flat, 5-section, without color print			
5-section, for 50 terminal blocks	**ZBF 12:UNBEDRUCKT**	0809735	10
	ZBF 8:UNBEDRUCKT	0808781	10
5-section	**ZBF 12 CUS**	0825018	1
	ZBF 8 CUS	0825030	1

Bus and power cable with M12 connector

Phoenix Contact offers a complete range of bus and power cables for the Fieldline system.

INTERBUS bus cable

PROFINET bus cable

PROFIBUS bus cable

DeviceNet™/CANopen® bus cable

		Ordering data		Ordering data		Ordering data		Ordering data	
Description	**Length of cable**	**Order No.**	Pcs./Pkt.	**Order No.**	Pcs./Pkt.	**Order No.**	Pcs./Pkt.	**Order No.**	Pcs./Pkt.
Pre-assembled bus cable M12 pin, straight, shielded, free conductor end									
	1 m			1407495	1				
	2 m	1517877	1	1407496	1	1518025	1	1518177	1
	5 m	1517880	1	1407497	1	1518038	1	1518180	1
	10 m	1517893	1	1407498	1	1518041	1	1518193	1
	15 m	1517903	1	1524336	1	1518054	1	1518203	1
Pre-assembled bus cable M12 socket, straight, shielded, free conductor end									
	1 m			1407528	1				
	2 m	1517916	1	1407529	1	1518067	1	1518216	1
	5 m	1517929	1	1407530	1	1518070	1	1518229	1
	10 m	1517932	1	1407531	1	1518083	1	1518232	1
	15 m	1517945	1			1518096	1	1518245	1
Pre-assembled bus cable M12 pin, straight, shielded, M12 socket, straight, shielded									
	0.3 m	1517958	1			1518106	1	1518258	1
	0.5 m	1517961	1			1518119	1	1518261	1
	1 m	1517974	1	1407553	1	1518122	1	1518274	1
	2 m	1517987	1	1407554	1	1518135	1	1518287	1
	5 m	1517990	1	1407555	1	1518148	1	1518290	1
	10 m	1518009	1	1407556	1	1518151	1	1518300	1
	15 m	1518012	1			1518164	1	1518313	1
Pre-assembled bus cable M12 pin, straight, shielded, M12 pin, straight, shielded									
	0.3 m			1524349	1				
	0.5 m			1524352	1				
	1 m			1407524	1				
	2 m			1407525	1				
	5 m			1407526	1				
	10 m			1407527	1				
	15 m			1524404	1				

Ethernet bus cable

Local bus cable

Fieldline Modular power cable

Fieldline Stand-Alone power cable

		Ordering data		Ordering data		Ordering data		Ordering data	
Description	**Length of cable**	**Order No.**	Pcs./Pkt.	**Order No.**	Pcs./Pkt.	**Order No.**	Pcs./Pkt.	**Order No.**	Pcs./Pkt.
Pre-assembled bus cable M12 pin, straight, shielded, free conductor end									
	1 m	1407356	1						
	2 m	1407357	1	1517877	1				
	5 m	1407358	1	1517880	1				
	10 m	1407359	1	1517893	1				
	15 m	1569427	1	1517903	1				
Pre-assembled bus cable M12 socket, straight, shielded, free conductor end									
	1 m	1407380	1						
	2 m	1407381	1	1517916	1				
	5 m	1407382	1	1517929	1				
	10 m	1407383	1	1517932	1				
	15 m			1517945	1				
Pre-assembled bus cable M12 pin, straight, shielded, M12 socket, straight, shielded									
	0.13 m			1518478	1				
	0.3 m			1517958	1				
	0.5 m			1517961	1				
	1 m	1407400	1	1517974	1				
	2 m	1407401	1	1517987	1				
	5 m	1407402	1	1517990	1				
	10 m	1407403	1	1518009	1				
	15 m			1518012	1				
Pre-assembled bus cable M12 pin, straight, shielded, M12 pin, straight, shielded									
	0.5 m	1569443	1						
	1 m	1407376	1						
	2 m	1407377	1						
	5 m	1407378	1						
	10 m	1407379	1						
Pre-assembled power cable M12 pin, straight, free conductor end									
	2 m					1518326	1	1555606	1
	5 m					1518339	1	1555619	1
	10 m					1518342	1	1555622	1
	15 m					1518355	1	1555635	1
Pre-assembled power cable M12 socket, straight, free conductor end									
	2 m					1518368	1	1555648	1
	5 m					1518371	1	1555651	1
	10 m					1518384	1	1555664	1
	15 m					1518397	1	1555677	1
Pre-assembled power cable M12 pin, straight, M12 socket, straight									
	0.13 m					1518481	1		
	0.3 m					1518407	1	1555680	1
	0.5 m					1518410	1	1555693	1
	1 m					1518423	1	1555703	1
	2 m					1518436	1	1555716	1
	5 m					1518449	1	1555729	1
	10 m					1518452	1	1555732	1
	15 m					1518465	1	1555745	1

Bus and power cable with M8 connector

The following assembled cables are available for connecting Fieldline Modular M8 devices:

– System cables for the supply voltage and bus signal
– Power cables for the actuator voltage

Straight connector

Angled connector

Description	Length of cable	Ordering data: Type	Order No.	Pcs./Pkt.	Ordering data: Type	Order No.	Pcs./Pkt.
Pre-assembled system cable M8 pin, straight, shielded, free conductor end							
	2 m	SAC-4P-M 8MS/ 2,0-950	1543249	1			
	5 m	SAC-4P-M 8MS/ 5,0-950	1543252	1			
	10 m	SAC-4P-M 8MS/10,0-950	1543265	1			
	20 m	SAC-4P-M 8MS/20,0-950	1543281	1			
Pre-assembled system cable M8 pin, angled, shielded, free conductor end							
	2 m				SAC-4P-M 8MR/ 2,0-950	1550850	1
	5 m				SAC-4P-M 8MR/ 5,0-950	1550863	1
	10 m				SAC-4P-M 8MR/10,0-950	1550876	1
	20 m				SAC-4P-M 8MR/20,0-950	1550892	1
Pre-assembled system cable M8 socket, straight, shielded, free conductor end							
	2 m	SAC-4P- 2,0-950/M 8FS	1543294	1			
	5 m	SAC-4P- 5,0-950/M 8FS	1543304	1			
	10 m	SAC-4P-10,0-950/M 8FS	1543317	1			
	20 m	SAC-4P-20,0-950/M 8FS	1543333	1			
Pre-assembled system cable M8 socket, angled, shielded, free conductor end							
	2 m				SAC-4P- 2,0-950/M 8FR	1550902	1
	5 m				SAC-4P- 5,0-950/M 8FR	1550915	1
	10 m				SAC-4P-10,0-950/M 8FR	1550928	1
	20 m				SAC-4P-20,0-950/M 8FR	1550944	1
Pre-assembled system cable M8 pin, straight, shielded, M8 socket, straight, shielded							
	0.13 m	SAC-4P-M 8MS/ 0,13-950/M 8FS	1543346	1			
	0.3 m	SAC-4P-M 8MS/ 0,3-950/M 8FS	1543511	1			
	0.5 m	SAC-4P-M 8MS/ 0,5-950/M 8FS	1543524	1			
	1 m	SAC-4P-M 8MS/ 1,0-950/M 8FS	1543537	1			
	2 m	SAC-4P-M 8MS/ 2,0-950/M 8FS	1543359	1			
	5 m	SAC-4P-M 8MS/ 5,0-950/M 8FS	1543362	1			
	10 m	SAC-4P-M 8MS/10,0-950/M 8FS	1543375	1			
	20 m	SAC-4P-M 8MS/20,0-950/M 8FS	1543391	1			
Pre-assembled system cable M8 pin, angled, shielded, M8 socket, angled, shielded							
	0.13 m				SAC-4P-M 8MR/ 0,13-950/M 8FR	1550957	1
	0.3 m				SAC-4P-M 8MR/ 0,3-950/M 8FR	1550960	1
	0.5 m				SAC-4P-M 8MR/ 0,5-950/M 8FR	1550973	1
	1 m				SAC-4P-M 8MR/ 1,0-950/M 8FR	1550986	1
	2 m				SAC-4P-M 8MR/ 2,0-950/M 8FR	1550999	1
	5 m				SAC-4P-M 8MR/ 5,0-950/M 8FR	1551008	1
	10 m				SAC-4P-M 8MR/10,0-950/M 8FR	1551011	1
	20 m				SAC-4P-M 8MR/20,0-950/M 8FR	1551037	1
Pre-assembled power cable M8 socket, straight, free conductor end, 4 x 0.34 mm²							
	2 m	SAC-4P- 2,0-PUR/M 8FS 0,34	1543582	1			
	5 m	SAC-4P- 5,0-PUR/M 8FS 0,34	1534818	5			
	10 m	SAC-4P-10,0-PUR/M 8FS 0,34	1543595	1			
	20 m	SAC-4P-20,0-PUR/M 8FS 0,34	1543618	1			
Pre-assembled power cable M8 socket, angled, free conductor end, 4 x 0.34 mm²							
	2 m				SAC-4P- 2,0-PUR/M 8FR 0,34	1553077	1
	5 m				SAC-4P- 5,0-PUR/M 8FR 0,34	1553080	1
	10 m				SAC-4P-10,0-PUR/M 8FR 0,34	1553093	1
	20 m				SAC-4P-20,0-PUR/M 8FR 0,34	1553116	1

Mountable connectors

Connectors that can be assembled enable the flexible cabling of Fieldline devices.
– M12 or M8 connection method
– Shielded or unshielded
– QUICKON, spring-cage or insulation displacement connection

Ethernet

SPEEDCON LOCKING

M12 connector

M8 connector

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
M12 connector, shielded						
M12 pin, 5-pos., A-coded, QUICKON connection	SACC-MS-5QO-0,75 SH SCO	1413991	1			
M12 socket, 5-pos., A-coded, QUICKON connection	SACC-FS-5QO-0,75 SH SCO	1413992	1			
M12 pin, 5-pos., A-coded, QUICKON connection, DeviceNet™	SACC-MS-5QO SH DN SCO	1422759	1			
M12 socket, 5-pos., A-coded, QUICKON connection, DeviceNet™	SACC-FS-5QO SH DN SCO	1422760	1			
M12 pin, 5-pos., B-coded, spring-cage connection, INTERBUS	SACC-MSB-5PTL SH IB SCO	1424674	1			
M12 socket, 5-pos., B-coded, spring-cage connection, INTERBUS	SACC-FSB-5PTL SH IB SCO	1424676	1			
M12 pin, 2-pos., B-coded, QUICKON connection, PROFIBUS	SACC-MSB-2QO SH PB SCO	1413931	1			
M12 socket, 2-pos., B-coded, QUICKON connection, PROFIBUS	SACC-FSB-2QO SH PB SCO	1413932	1			
M12 pin, 4-pos., D-coded, QUICKON connection, Ethernet	SACC-MSD-4QO SH ETH SCO	1411066	1			
M12 socket, 4-pos., D-coded, QUICKON connection, Ethernet	SACC-FSD-4QO SH ETH SCO	1411069	1			
M12 pin, 4-pos., D-coded, QUICKON connection, PROFINET	SACC-MSD-4QO SH PN SCO	1411068	1			
M12 socket, 4-pos., D-coded, QUICKON connection, PROFINET	SACC-FSD-4QO SH PN SCO	1411071	1			
M8 connector, shielded						
M8 pin, 4-pos., screw connection				SACC-M 8MS-4CON-M-0,34-SH	1542897	1
M8 socket, 4-pos., screw connection				SACC-M 8FS-4CON-M-0,34-SH	1542910	1
M12 connector, unshielded						
M12 pin, 4-pos., A-coded, QUICKON connection method, cross section 0.14 - 0.34 mm², SPEEDCON quick locking system	SACC-MS-4QO-0,34-M SCO	1521575	1			
M12 socket, 4-pos., A-coded, QUICKON connection method, cross section 0.14 - 0.34 mm², SPEEDCON quick locking system	SACC-FS-4QO-0,34-M SCO	1521588	1			
M12 pin, 4-pos., A-coded, QUICKON connection method, cross section 0.34 - 0.75 mm², SPEEDCON quick locking system	SACC-MS-4QO-0,75-M SCO	1521591	1			
M12 socket, 4-pos., A-coded, QUICKON connection method, cross section 0.34 - 0.75 mm², SPEEDCON quick locking system	SACC-FS-4QO-0,75-M SCO	1521601	1			
M12 pin, 5-pos., A-coded, spring-cage connection	SACC-M12MS-5SC M	1508187	1			
M12 socket, 5-pos., A-coded, spring-cage connection	SACC-M12FS-5SC M	1508200	1			
M8 connector, unshielded						
M8 pin, 3-pos., insulation displacement connection				SACC-M 8MS-3QO-0,5-M	1441024	1
M8 socket, 4-pos., insulation displacement connection				SACC-M 8FS-4QO-0,5-M	1441079	1

Product overview

M12 I/O devices

Digital input	Digital output	Digital input/output		
4 channels	8 channels	2/2 channels	4/3 channels	4/4 channels
226	226	227	227	227

M8 I/O devices

Digital input	Digital input/output
4 channels	4/4 channels
228	228

I/O devices in ME housing

Digital input	Digital input/output
4 channels	4/3 channels
229	229

Gateways

PROFIBUS DP

Standard function	Extended function
230	230

Inline

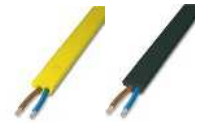
Standard function
231

Power supplies

Primary-switched

2.4 A	4.8 A
232	232

Accessories – installation material



VS-ASI-FC-...
Flat-ribbon conductors

233

...ASI-...-FIX
Mounting material

233

Q 1,5/...-ASI BK
Panel feed-throughs

233

HC-M-KV-...
Screw connections

233

VS-ASI-J-Y...
Distributors

234

VS-ASI-...-PUR-...M12...
Distributors with M12 round cable

234

VS-ASI-J-Y-...
Distributors with M12 connection

235

SAC-4P-...
M12 round cables

221

ASI CC ADR CAB CINCH
Cinch connecting cable,
for addressing
FLX ASI M12 devices

PB ECO LINK
PROFIBUS ECO Link,
RS-232 (V.24) PROFIBUS converter

phoenixcontact.net/products

Digital I/O devices with M12 connection technology

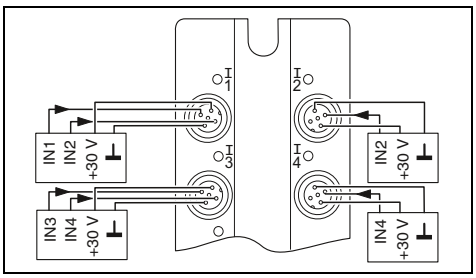
The innovative locking mechanism enables quick and easy installation of the I/O devices.

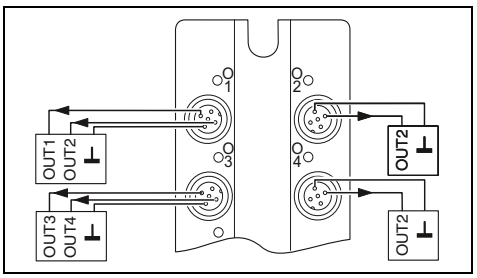
Features:

- Optimized for direct mounting and DIN rail mounting
- Tool-free connection to AS-Interface using penetration technique
- M12 connection technology with SPEEDCON fast locking system for the inputs and outputs

4 digital inputs

4 digital outputs





		Technical data	Technical data
Interface			
Fieldbus system		AS-i	AS-i
Connection method		Flat-ribbon cable penetration technique	Flat-ribbon cable penetration technique
AS-Interface			
AS-i specification		2.1	2.0
Required master specification		>= 2.0	>= 2.0
AS-i profile		S-0.A.2	S-8.1
Digital inputs			
Connection method		M12 connector	-
Connection method		2, 3-wire	-
Number of inputs		4	-
Input characteristic curve		IEC 61131-2 type 2	-
Digital outputs			
Connection method		-	M12 connector
Connection method		-	2-wire
Number of outputs		-	-
Maximum output current per channel		-	2 A
Maximum output current per module / terminal block		-	4 A
General data			
Weight		195 g	195 g
Drill hole spacing		108 mm	108 mm
Dimensions	W / H / D	58 mm / 118 mm / 35 mm	58 mm / 118 mm / 35 mm
Degree of protection		IP65/IP67	IP65/IP67
Ambient temperature (operation)		-25 °C ... 70 °C	-25 °C ... 70 °C
EMC note		Class A product, see page 525	Class A product, see page 525

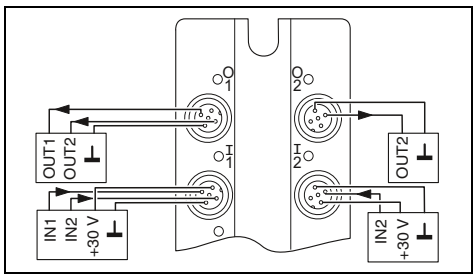
Description	Ordering data Type	Order No.	Pcs./Pkt.	Ordering data Type	Order No.	Pcs./Pkt.
Fieldline Extension AS-i digital input device						
- 4 inputs	**FLX ASI DI 4 M12**	2773429	1			
Fieldline Extension AS-i digital output device						
- 4 outputs, 2 A				**FLX ASI DO 4 M12-2A**	2773458	1
Fieldline Extension AS-i digital I/O device						
- 2 inputs, 2 outputs, 2 A						
- 4 inputs, 3 outputs, 2 A						
- 4 inputs, 4 outputs, 2 A						

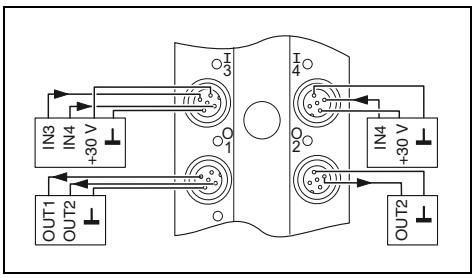
	Accessories			Accessories		
M12 screw plug	**PROT-M12**	1680539	5	**PROT-M12**	1680539	5
Label sheet for laser printers, 64 x 16 mm, color: White	**BMKL 64X16 WH**	0821807	2	**BMKL 64X16 WH**	0821807	2
Label sheet for laser printers, 108 x 16 mm, color: White						
Manual addressing device, for AS-Interface devices	**ASI CC ADR**	2741338	1	**ASI CC ADR**	2741338	1
Programming cable, for addressing the AS-i devices	**ASI CC ADR CAB CINCH**	2741341	1	**ASI CC ADR CAB CINCH**	2741341	1

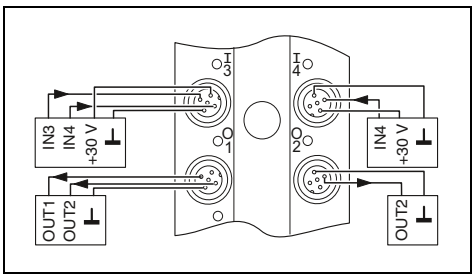
2 digital inputs and 2 digital outputs

4 digital inputs and 3 digital outputs

4 digital inputs and 4 digital outputs







Technical data

AS-i	
Flat-ribbon cable penetration technique	
2.1	
>= 2.0	
S-B.A.2	
M12 connector	
2, 3-wire	
2	
IEC 61131-2 type 2	
M12 connector	
2-wire	
2	
2 A	
4 A	
195 g	
108 mm	
58 mm / 118 mm / 35 mm	
IP65/IP67	
-25 °C ... 70 °C	
Class A product, see page 525	

Technical data

AS-i	
Flat-ribbon cable penetration technique	
2.1	
>= 2.0	
S-7.A.2	
M12 connector	
2, 3-wire	
4	
IEC 61131-2 type 2	
M12 connector	
2-wire	
3	
2 A	
4 A	
245 g	
108 mm	
58 mm / 150 mm / 35 mm	
IP65/IP67	
-25 °C ... 70 °C	
Class A product, see page 525	

Technical data

AS-i	
Flat-ribbon cable penetration technique	
3.0	
>= 3.0	
S-7.A.7	
M12 connector	
2, 3-wire	
4	
IEC 61131-2 type 2	
M12 connector	
2-wire	
4	
2 A	
245 g	
108 mm	
58 mm / 150 mm / 35 mm	
IP65/IP67	
-25 °C ... 70 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FLX ASI DIO 2/2 M12-2A	2773432	1

Ordering data

Type	Order No.	Pcs./Pkt.
FLX ASI DIO 4/3 M12-2A	2773445	1

Ordering data

Type	Order No.	Pcs./Pkt.
FLX ASI 3.0 DIO 4/4 M12-2A	2773474	1

Accessories

PROT-M12	1680539	5
BMKL 64X16 WH	0821807	2
ASI CC ADR	2741338	1
ASI CC ADR CAB CINCH	2741341	1

Accessories

PROT-M12	1680539	5
BMKL 11,5 (108X16) WH	0821797	2
ASI CC ADR	2741338	1
ASI CC ADR CAB CINCH	2741341	1

Accessories

PROT-M12	1680539	5
BMKL 11,5 (108X16) WH	0821797	2
ASI CC ADR	2741338	1
ASI CC ADR CAB CINCH	2741341	1

Digital I/O devices with M8 connection technology

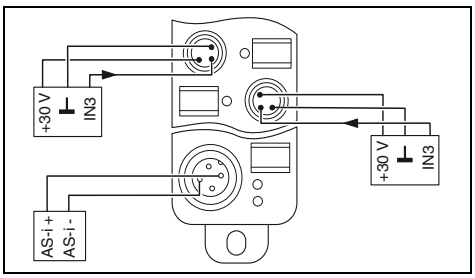
The digital I/O devices are particularly suitable for use in machines close to the process.

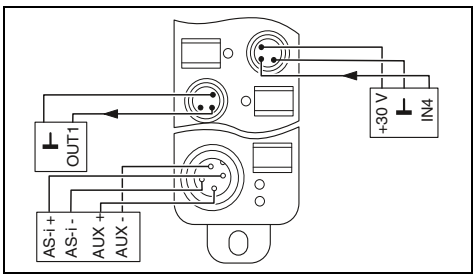
Features:

– Optimized for 30 mm mounting profile
– M12 connection technology with SPEEDCON fast locking system for the AS-Interface connection
– M8 connection technology for inputs and outputs

4 digital inputs

4 digital inputs and 4 digital outputs





		Technical data	Technical data
Interface			
Fieldbus system		AS-i	AS-i
Connection type		M12 connector, (A-coded)	M12 connector, (A-coded)
AS-Interface			
AS-i specification		2.0	2.0
Required master specification		>= 2.0	>= 2.0
AS-i profile		S-0.0	S-7.0
Digital inputs			
Connection type		M8 connector	M8 connector
Connection method		2, 3-wire	2, 3-wire
Number of inputs		4	4
Input characteristic curve		IEC 61131-2 type 2	IEC 61131-2 type 2
Digital outputs			
Connection type		-	M8 connector
Connection method		-	2-wire
Number of outputs		-	4
Maximum output current per channel		-	1 A
Maximum output current per module / terminal block		-	4 A
General data			
Weight		85 g	125 g
Drill hole spacing		93 mm	133 mm
Dimensions	W / H / D	30 mm / 26 mm / 103 mm	30 mm / 26 mm / 143 mm
Degree of protection		IP65/IP67	IP65/IP67
Ambient temperature (operation)		-25 °C ... 70 °C	-25 °C ... 70 °C
EMC note		Class A product, see page 525	Class A product, see page 525

Description	Type	Order No.	Pcs./Pkt.
Fieldline Extension AS-i digital input device			
- 4 inputs	**FLX ASI DI 4 M8**	2773403	1
Fieldline Extension AS-i digital I/O device			
- 4 inputs, 4 outputs, 1 A	**FLX ASI DIO 4/4 M8-1A**	2773416	1

Accessories

M8 screw plug	**PROT-M8**	1682540	5
Zack marker strip, flat, 10-section, without color print	**ZBF 8:UNBEDRUCKT**	0808781	10
Manual addressing device, for AS-Interface devices	**ASI CC ADR**	2741338	1

Digital I/O devices with COMBICON connection method

The slim digital I/O devices in the ME range are particularly suitable for use in the control cabinet.

Features:

– 12.5 mm design width
– Optimized for DIN rail mounting
– COMBICON connection technology for AS-Interface
– COMBICON connection technology for the I/Os

4 digital inputs

4 digital inputs and 3 digital outputs

Ex:

		Technical data	Technical data
Interface			
Fieldbus system		AS-i	AS-i
Connection type		COMBICON connectors	COMBICON connectors
AS-Interface			
AS-i specification		2.1	2.1
Required master specification		>= 2.0	>= 2.0
AS-i profile		S-0.A.0	S-7.A.0
Digital inputs			
Connection type		COMBICON connectors	COMBICON connectors
Connection method		2, 3-wire	2, 3-wire
Number of inputs		4	4
Digital outputs			
Connection type		-	COMBICON connectors
Connection method		-	2, 3-wire
Number of outputs		-	3
Maximum output current per channel		-	1.5 A
Maximum output current per module / terminal block		-	6 A
General data			
Weight		150 g	150 g
Dimensions	W / H / D	22.5 mm / 102 mm / 105 mm	22.5 mm / 102 mm / 105 mm
Degree of protection		IP20	IP20
Ambient temperature (operation)		-25 °C ... 60 °C	-25 °C ... 60 °C
EMC note		Class A product, see page 525	Class A product, see page 525

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Fieldline Extension AS-i digital input device, including COMBICON connector - 4 inputs	**ASI IO ME DI 4 AB**	2741671	1			
Fieldline Extension AS-i digital I/O device, including COMBICON connector - 4 inputs, 3 outputs				**ASI IO ME DIO 4/3 AB**	2741668	1
	Accessories			**Accessories**		
Manual addressing device, for AS-Interface devices	**ASI CC ADR**	2741338	1	**ASI CC ADR**	2741338	1
Programming cable, for addressing the AS-i devices	**ASI CC ADR CAB CINCH**	2741341	1	**ASI CC ADR CAB CINCH**	2741341	1

Gateways for PROFIBUS DP

Fieldline Extension AS-Interface gateways enable the easy integration of AS-Interface in a PROFIBUS DP system.

Features:

– AS-Interface specification 3.0
– For one or two AS-Interface networks
– High-grade steel housing
– IP20 degree of protection

Standard function

Extended function, double master

		Technical data	Technical data
Interfaces			
PROFIBUS DP remote bus		D-SUB 9 connector	D-SUB 9 connector
AS-Interface		2-pos. COMBICON connector	2-pos. COMBICON connector
Power supply			
Typical current consumption		approx. 200 mA (from the AS-i network)	approx. 200 mA (from AS-i circuit 1)
Indicators			
Operating voltage, electronics module (UL)		Green LED	Green LED
Operating voltage AS-i (U ASI)		Green LED	Green LED
AS-i transmission (ASI ACTIVE)		Green LED	Green LED
Programming mode active, automatic slave programming possible		Green LED	Green LED
Configuration mode active (PRJ Enable)		Yellow LED	Yellow LED
AS-i configure error (CONFIG ERR)		LED red	LED red
AS-Interface			
Number of AS-i slaves		62	62
AS-i specification		3.0	3.0
Operating elements			
Keys		2 buttons (Mode/Set) for configuring the AS-i network	4 Buttons (Mode/Set/ESC/OK) for configuring the AS-i network
General data			
Weight		300 g	460 g
Dimensions	W / H / D	45 mm / 120 mm / 44 mm	75 mm / 120 mm / 83 mm
Degree of protection		IP20	IP20
Ambient temperature (operation)		0 °C ... 55 °C	0 °C ... 55 °C
Ambient temperature (storage/transport)		-25 °C ... 85 °C	-25 °C ... 85 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Fieldline Extension AS-i gateway for PROFIBUS DP						
- With standard function	**FLX ASI MA PB SF**	2773597	1			
- With extended function, double master				**FLX ASI MA 2 PB EF**	2773607	1
	Accessories			**Accessories**		
PROFIBUS ECO Link, RS-232 (V.24) PROFIBUS converter, incl. software for PC	**PB ECO LINK**	2741480	1	**PB ECO LINK**	2741480	1

Gateway for Inline

When used in combination with an appropriate Inline bus coupler, the AS-Interface gateway for Inline enables universal integration in the following networks, for example:
– INTERBUS
– PROFINET
– PROFIBUS
– CANopen®
– DeviceNet™
– EtherNet/IP™

Notes:

The driver function blocks can be obtained free of charge on the Internet at phoenixcontact.net/products under Download on the product page of the corresponding module.

Standard function

Technical data

Interfaces		
Inline local bus		Inline data jumper
AS-Interface		Inline plug
Power supply		
Typical current consumption		200 mA (from the AS-i network)
Indicators		
Local bus diagnostics		Green LED
Operating voltage AS-i (U ASI)		Green LED
PCP communication		Green LED
Automatic address programming active		Green LED
Configuration mode active (PRJ Enable)		Yellow LED
AS-i configure error (CONFIG ERR)		LED red
AS-Interface		
Number of AS-i slaves		62
AS-i specification		2.1
Operating elements		
Keys		2 buttons (Mode/Set) for configuring the AS-i network
General data		
Number of PCP data		1 word
Weight		210 g
Dimensions	W / H / D	73.2 mm / 119.8 mm / 71.5 mm
Degree of protection		IP20
Ambient temperature (operation)		-25 °C ... 55 °C
Ambient temperature (storage/transport)		-25 °C ... 85 °C

Ordering data

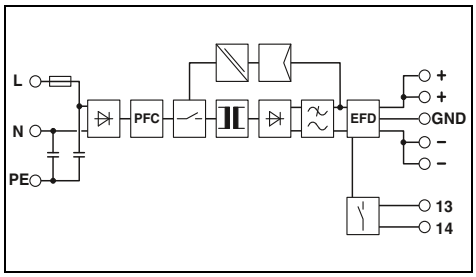
Description	Type	Order No.	Pcs./Pkt.
Fieldline Extension AS-i gateway for Inline Modular			
	ASI MA IL UNI	2736628	1

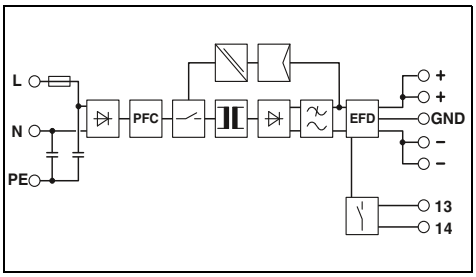
Power supplies

The power supplies specially designed for AS-Interface offer the following features:
– 2.4 A or 4.8 A nominal output current
– Integrated ground fault detector
– Wide-range input for operation on all common AC and DC networks

2.4 A

4.8 A





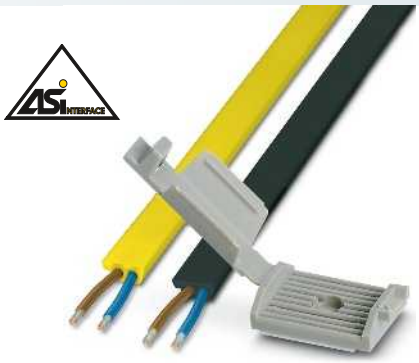
	Technical data	Technical data
Input data		
Nominal input voltage	100 V AC ... 240 V AC	100 V AC ... 240 V AC
Frequency range	45 Hz ... 65 Hz / 0 Hz	45 Hz ... 65 Hz / 0 Hz
Current consumption (nominal load)	approx. 1 A (120 V AC) / 0.5 A (230 V AC)	approx. 1.8 A (120 V AC) / 1 A (230 V AC)
Inrush current limitation at 25°C / I^2t	< 15 A / 2.2 A^2s	< 15 A / 2.2 A^2s
Mains buffering (I_N, typ.)	> 20 ms (120 V AC) / > 80 ms (230 V AC)	> 60 ms (120 V AC) / > 100 ms (230 V AC)
Switch-on time after applying the mains voltage	< 0.5 s	< 0.5 s
Input fuse	5 A (slow-blow, internal)	5 A (slow-blow, internal)
Output data		
Nominal output voltage	30.1 V DC ±1.5 %	30.1 V DC ±1.5 %
Output current	2.4 A	4.8 A
Output current / Max. output current	2.4 A / - 3 A	4.8 A / - 6 A
Max. power dissipation (no load/nominal load)	3 W / 11 W	4 W / 16 W
Residual ripple	< 30 mV_{PP}	< 30 mV_{PP}
Signaling		
Signaling DC OK	LED	LED
Signaling EFD	LED, relay contact	LED, relay contact
General data		
Weight / Dimensions W x H x D	0.75 kg / 55 x 145 x 125 mm	0.9 kg / 70 x 145 x 125 mm
Mounting position	horizontal DIN rail NS 35, EN 60715	horizontal DIN rail NS 35, EN 60715
Assembly instructions	Can be aligned: Horizontally 0 mm, vertically 50 mm	Can be aligned: Horizontally 0 mm, vertically 50 mm
Connection method	Plug-in spring-cage connection	Plug-in spring-cage connection
Degree of protection	IP20	IP20
MTBF (IEC 61709, SN 29500)	> 500000 h	> 500000 h
Type of housing	AluNox (AlMg1)	AluNox (AlMg1)
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C Derating: 2,5 %/K)	-25 °C ... 70 °C (> 60 °C Derating: 2,5 %/K)
Ambient temperature (storage/transport)	-40 °C ... 85 °C	-40 °C ... 85 °C
UL approvals	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950	UL/C-UL listed UL 508 , UL/C-UL Recognized UL 60950

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Power supply, primary-switched						
	ASI QUINT 100-240/2.4 EFD	2736686	1	**ASI QUINT 100-240/4.8 EFD**	2736699	1

Flat-ribbon conductors, flat-ribbon conductor connectors and panel feed-throughs

Applications can be implemented in a wide range of fields thanks to the four different flat-ribbon conductor materials.

Components, e.g., with QUICKON fast connection technology, are available to connect or feed through these flat-ribbon conductors.



Flat-ribbon conductors and accessories

Flat-ribbon conductors and panel feed-throughs with QUICKON fast connection technology

Technical data

		VS-ASI-FC-PVC...	VS-ASI-FC-PUR...	Q 1,5/4IDC	Q 1,5/4M20
Mechanical data					
No. of pos.		2	2	4	4
Degree of protection		-	-	IP65/IP67	IP65/IP67
Cable data					
Outer sheath material		PVC	PUR	-	-
Conductor cross section		1.5 mm²	1.5 mm²	-	-
Connector data QUICKON connection					
Conductor cross section [mm²]		-	-	0.75 mm² ... 1.5 mm²	0.75 mm² ... 1.5 mm²
Conductor cross section [AWG]		-	-	18 ... 16	18 ... 16
Temperature data					
Plug/socket	[°C]	-	-	-25 ... 80	-25 ... 80
Cable, fixed installation	[°C]	-30 ... 90	-40 ... 85	-	-
Cable, flexible installation	[°C]	-20 ... 90	-30 ... 85	-	-

Ordering data

Description	Cable length	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
AS-Interface EPDM flat-ribbon conductor, 2 x 1.5 mm²							
yellow	100 m	**VS-ASI-FC-EPDM-YE 100M**	1432402	1			
yellow	1000 m	**VS-ASI-FC-EPDM-YE 1000M**	1434646	1			
black	100 m	**VS-ASI-FC-EPDM-BK 100M**	1432415	1			
black	1000 m	**VS-ASI-FC-EPDM-BK 1000M**	1434659	1			
AS-Interface PVC flat-ribbon conductor to UL, 2 x 1.5 mm²							
yellow	100 m	**VS-ASI-FC-PVC-UL-YE 100M**	1404906	1			
yellow	1000 m	**VS-ASI-FC-PVC-UL-YE/1000**	1404867	1			
black	100 m	**VS-ASI-FC-PVC-UL-BK 100M**	1404919	1			
black	1000 m	**VS-ASI-FC-PVC-UL-BK/1000**	1404870	1			
AS-Interface TPE flat-ribbon conductor to UL, 2 x 1.5 mm²							
yellow	100 m	**VS-ASI-FC-TPE-UL-YE 100M**	1404922	1			
yellow	1000 m	**VS-ASI-FC-TPE-UL-YE 1000M**	1434662	1			
black	100 m	**VS-ASI-FC-TPE-UL-BK 100M**	1404935	1			
black	1000 m	**VS-ASI-FC-TPE-UL-BK 1000M**	1434675	1			
AS-Interface PUR flat-ribbon conductor, 2 x 1.5 mm²							
yellow	100 m	**VS-ASI-FC-PUR-YE 100M**	1404883	1			
yellow	1000 m	**VS-ASI-FC-PUR-YE/1000**	1404841	1			
black	100 m	**VS-ASI-FC-PUR-BK 100M**	1404896	1			
black	1000 m	**VS-ASI-FC-PUR-BK/1000**	1404854	1			
Flat connector, 4-pos., for connecting one or two AS-i flat-ribbon conductors					**Q 1,5/4IDC/24-24KU-KU-ASI-BK**	1585058	1
Panel feed-through, for accommodating one or two AS-i flat-ribbon conductors, on the rear side with manual solder/slip-on connection 4.8 x 0.8 mm					**Q 1,5/4FL/24-M20KU-ESA-ASI BK**	1437261	1
Panel feed-through, for accommodating one or two AS-Interface flat-ribbon conductors, on the rear side with four individual 1.5 mm² wires	0.5 m				**Q 1,5/4A50/24-M20KU-ESA-ASI BK**	1437274	1
Metal gland, for AS-Interface flat-ribbon conductor							
Thread type: M20					**HC-M-KV-M20(1ASI)**	1584017	10
Thread type: M25					**HC-M-KV-M25(1ASI)**	1584020	10

Distributor with spring connection and with round cables

Thanks to the distributors, it is extremely easy to create various topologies.

The following combinations are available:

– Flat-ribbon conductor to spring-cage terminal block
– Flat-ribbon conductor to flat-ribbon conductor
– Flat-ribbon conductor to round cable

Flat-ribbon conductor distributor and distributor with spring connection

Distributor with round cable and molded M12 connector with SPEEDCON

Technical data

		SAC-ASI-J-Y-B...	VS-ASI-J-Y-Y-N
Electrical data			
Rated voltage		≤ 35 V	≤ 35 V
Rated current		≤ 6 A	≤ 8 A
Material specifications for exit			
Material of grip body		-	-
Material specifications for distributor			
Housing material		PA-GF	PA-GF
Mechanical data			
No. of pos.		4	4
Degree of protection		IP20	IP65/IP67/IP69K
Connection data for spring-cage terminal blocks			
Conductor cross section		0.2 mm² ... 1.5 mm²	-
Connection cross section AWG		24 ... 16	-
Cable data			
Outer sheath material		-	-
External cable diameter		-	-
Conductor cross section		-	-
Temperature data			
Plug/socket	[°C]	-25 ... 75	-25 ... 75
Cable, fixed installation	[°C]	-	-
Cable, flexible installation	[°C]	-	-

Technical data

		SAC-ASI-J-Y-N...	SAC-ASI-J-Y-B...
Electrical data			
Rated voltage		≤ 35 V	≤ 35 V
Rated current		≤ 4 A	≤ 4 A
Material specifications for exit			
Material of grip body		TPU	TPU
Material specifications for distributor			
Housing material		PA-GF	PA-GF
Mechanical data			
No. of pos.		2	4
Degree of protection		IP65/IP67	IP65/IP67
Connection data for spring-cage terminal blocks			
Conductor cross section		-	-
Connection cross section AWG		-	-
Cable data			
Outer sheath material		PUR	PUR
External cable diameter		4.70 mm	4.70 mm
Conductor cross section		0.34 mm²	0.34 mm²
Temperature data			
Plug/socket	[°C]	-25 ... 75	-25 ... 75
Cable, fixed installation	[°C]	-40 ... 80	-40 ... 80
Cable, flexible installation	[°C]	-25 ... 80	-25 ... 80

Ordering data

Description	Cable length	Type	Order No.	Pcs./Pkt.
AS-Interface distributor with IP20 protection for **2 flat-ribbon conductors**, 4-pos., with **spring terminal blocks**		**VS-ASI-J-Y-B-FFKDS**	**1404498**	1
AS-Interface H distributors with high degree of protection, for distribution from one to two flat-ribbon conductors		**VS-ASI-J-Y-Y-N**	**1404508**	1
AS-Interface distributors with IP67 degree of protection for **one flat-ribbon conductor**, with **PUR** round cable and molded, **straight**, A-coded, **2-pos.** M12 socket with SPEEDCON				
	1 m			
	2 m			
AS-Interface distributors with IP67 degree of protection for **two flat-ribbon conductors**, with **PUR** round cable and molded, **straight**, A-coded, **4-pos.** M12 socket with SPEEDCON				
	1 m			
	2 m			
AS-Interface distributors with IP67 degree of protection for **two flat-ribbon conductors**, with **PUR** round cable and molded, **angled**, A-coded, **4-pos.** M12 socket with SPEEDCON				
	1 m			
	2 m			

Ordering data

Type	Order No.	Pcs./Pkt.
VS-ASI-J-Y-N-PUR-1,0-M12FS SCO	**1404430**	1
VS-ASI-J-Y-N-PUR-2,0-M12FS SCO	**1404443**	1
VS-ASI-J-Y-B-PUR-1,0-M12FS SCO	**1404456**	1
VS-ASI-J-Y-B-PUR-2,0-M12FS SCO	**1404472**	1
VS-ASI-J-Y-B-PUR-1,0-M12FR SCO	**1404469**	1
VS-ASI-J-Y-B-PUR-2,0-M12FR SCO	**1404485**	1

Distributors with M12 sockets, with screw connection, pre-assembled round conductors

Thanks to the distributors, it is extremely easy to create various topologies.

The following combinations are available:

– Flat-ribbon conductor to M12 socket
– Flat-ribbon conductor to screw connection

Distributors with M12 slot and with screw connection

PUR round conductors with molded M12-SPEEDCON connectors

Technical data

		VS-ASI-J-Y-N-M12FS	VS-ASI-J-Y-N-SWA-LC
Material data			
Housing material		PA-GF	PA
Material of grip body		-	-
No. of pos.		2	2
Degree of protection		IP65/IP67/IP69K	IP67
Connection data for screw connection			
Conductor cross section		-	0.14 mm² ... 1 mm² (solid)
Connection cross section AWG		-	26 ... 17 (solid)
Conductor cross section		-	0.14 mm² ... 0.75 mm² (with ferrules)
Connection cross section AWG		-	26 ... 18 (with ferrules)
Cable data			
Conductor cross section		-	-
Temperature data			
Plug/socket	[°C]	-25 ... 75	-25 ... 70
Cable, fixed installation	[°C]	-	-
Cable, flexible installation	[°C]	-	-

Technical data

-
TPU, hardly inflammable, self-extinguishing
4
IP65/IP67
-
-
-
-
0.75 mm²
-25 ... 90
-25 ... 80
-5 ... 80

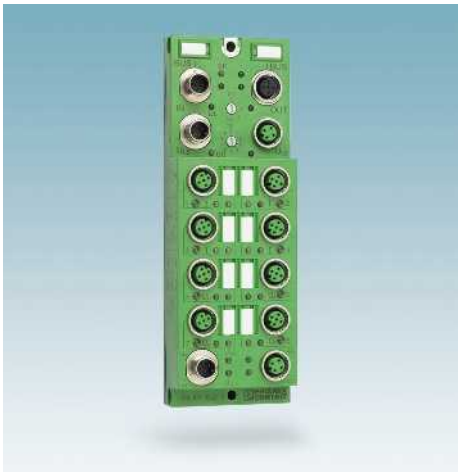
Ordering data

Description	Cable length	Type	Order No.	Pcs./Pkt.
AS-Interface distributor for flat-ribbon conductors, with straight, A-coded M12 socket				
one flat-ribbon conductor, 2-pos.		**VS-ASI-J-Y-N-M12FS**	**1404414**	1
Two flat-ribbon conductors, 4-pos.		**VS-ASI-J-Y-B-M12FS**	**1404427**	1
AS-Interface distributor, with straight, A-coded M12 socket				
one flat-ribbon conductor, 2-pos.		**VS-ASI-J-Y-N-M12FS-LC**	**1433155**	1
AS-Interface distributor, with screw connection, angled				
one flat-ribbon conductor, 2-pos.		**VS-ASI-J-Y-N-SWA-LC**	**1433168**	1
Pre-assembled round conductor M12 pin, straight, free conductor end				
	2 m			
	5 m			
	10 m			
	15 m			
Pre-assembled round conductor M12 socket, straight, free conductor end				
	2 m			
	5 m			
	10 m			
	15 m			
Pre-assembled round conductor M12 pin, straight, M12 socket, straight				
	0.3 m			
	0.5 m			
	1 m			
	2 m			
	5 m			
	10 m			
	15 m			

Ordering data

Type	Order No.	Pcs./Pkt.
SAC-4P-MS/ 2,0-186 SCO	**1555606**	1
SAC-4P-MS/ 5,0-186 SCO	**1555619**	1
SAC-4P-MS/10,0-186 SCO	**1555622**	1
SAC-4P-MS/15,0-186 SCO	**1555635**	1
SAC-4P- 2,0-186/FS SCO	**1555648**	1
SAC-4P- 5,0-186/FS SCO	**1555651**	1
SAC-4P-10,0-186/FS SCO	**1555664**	1
SAC-4P-15,0-186/FS SCO	**1555677**	1
SAC-4P-MS/ 0,3-186/FS SCO	**1555680**	1
SAC-4P-MS/ 0,5-186/FS SCO	**1555693**	1
SAC-4P-MS/ 1,0-186/FS SCO	**1555703**	1
SAC-4P-MS/ 2,0-186/FS SCO	**1555716**	1
SAC-4P-MS/ 5,0-186/FS SCO	**1555729**	1
SAC-4P-MS/10,0-186/FS SCO	**1555732**	1
SAC-4P-MS/15,0-186/FS SCO	**1555745**	1

Fieldline Stand-Alone



Fieldline Stand-Alone is an I/O system with a block design for field installation. Open to all common fieldbus systems, Fieldline Stand-Alone is optimized for the acquisition of digital signals directly in the field. The I/O system has a compact design and is versatile when it comes to mounting.

Your advantages:

– Flexible mounting, thanks to lateral and front mounting options
– Bus addresses can be set easily using rotary coding switches
– Ergonomic slot arrangement simplifies installation
– Integrated FE connection concept enables safe network operation

Notes:

A comprehensive range of installation materials for field installation can be found on page 218

Distributed I/O system with a block design

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Fieldline Stand-Alone digital I/O devices for INTERBUS M12			
- 8 inputs	**FLS IB M12 DI 8 M12**	**2736013**	1
- 16 inputs	**FLS IB M12 DI 16 M12**	**2736314**	1
- 4 inputs, 4 outputs	**FLS IB M12 DIO 4/4 M12-2A**	**2736026**	1
- 8 inputs, 8 outputs	**FLS IB M12 DIO 8/8 M12**	**2736385**	1
- 8 outputs	**FLS IB M12 DO 8 M12-2A**	**2736039**	1
Fieldline Stand-Alone digital I/O devices for PROFIBUS M12			
- 8 inputs	**FLS PB M12 DI 8 M12**	**2736123**	1
- 16 inputs	**FLS PB M12 DI 16 M12**	**2736220**	1
- 4 inputs, 4 outputs	**FLS PB M12 DIO 4/4 M12-2A**	**2736107**	1
- 8 inputs, 8 outputs	**FLS PB M12 DIO 8/8 M12**	**2736372**	1
- 8 outputs	**FLS PB M12 DO 8 M12-2A**	**2736110**	1
Fieldline Stand-Alone digital I/O devices for DeviceNet™ M12			
- 16 inputs	**FLS DN M12 DI 16 M12**	**2736327**	1
- 8 inputs, 8 outputs	**FLS DN M12 DIO 8/8 M12**	**2736398**	1
Fieldline Stand-Alone digital I/O devices for CANopen® M12			
- 16 inputs	**FLS CO M12 DI 16 M12**	**2736479**	1
- 8 inputs, 8 outputs	**FLS CO M12 DIO 8/8 M12**	**2736482**	1

Ruggedline

Distributed I/O system for the automotive body shop

The robust I/O devices with a block design are ideal for use in harsh industrial environments. They are available for INTERBUS and PROFINET systems. The I/O system was specially developed for body shop requirements in the automotive industry.

Your advantages:

– Safe communication even in environments subject to high levels of electromagnetic interference, thanks to data transmission via fiber optics
– Snap-in mounting plate assembly without the use of tools makes installation easier
– Particularly resistant to welding splash and mechanical damage
– Developed specifically for body shop requirements in the automotive industry

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ruggedline devices for PROFINET			
- Monitoring device, FO connection	**RL PN 24-2 OC 2SCRJ**	**2700654**	1
- 16 inputs, twisted pair connection	**RL PN 24-2 DI 16 2TX**	**2773665**	1
- 8 inputs, 8 I/Os, twisted pair connection	**RL PN 24-2 DIO 16/8 2TX**	**2773652**	1
- 8 inputs, 8 outputs, FO connection	**RL PN 24-2 DIO 8/8 2SCRJ**	**2773513**	1
Ruggedline devices for INTERBUS			
- BK module, FO connection	**IBS RL 24 BK RB-LK-LK**	**2725024**	1
- BK module, twisted pair connection	**IBS RL 24 BK RB-T-T**	**2731063**	1
- Monitoring device, FO connection	**IBS RL 24 OC-LK**	**2819972**	1
- 16 inputs, FO connection	**IBS RL 24 DI 16/8-LK**	**2724850**	1
- 16 inputs, twisted pair connection	**IBS RL 24 DI 16/8-T**	**2836463**	1
- 4 inputs, 2 outputs, FO connection	**IBS RL 24 DIO 4/2/4-LK**	**2819985**	1
- 8 inputs, 8 outputs, FO connection	**IBS RL 24 DIO 8/8/8-LK**	**2724847**	1
- 8 inputs, 8 readback outputs, FO connection	**IBS RL 24 DIO 8/8/8-R-LK**	**2734167**	1
- 8 inputs, 8 outputs, twisted pair connection	**IBS RL 24 DIO 8/8/8-T**	**2836476**	1
- 8 readback outputs, FO connection	**IBS RL 24 DO 16/8-R-LK**	**2734170**	1
- 8 outputs, 2 A, FO connection	**IBS RL 24 DO 8/8-2A-LK**	**2731034**	1
- 8 outputs, 2 A, twisted pair connection	**IBS RL 24 DO 8/8-2A-T**	**2731856**	1
- Motor starter, 400 V, 6 inputs, 1 output, FO connection	**IBS RL 400 MLR R DIO6/1 LK**	**2734769**	1

F-Address
a 0 1 2 3 4 5 6 7
PHOENIX CONTACT PSDO8/3 2701560
PWR
IN
K1
K2
MS20
S35
PSR-MC20
PSR-MXF4
PSR-TRISAFE-S
CONF STICK
CONFIRM
PWR
DATA
ERR
CONF

Functional Safety

Safety devices
– Modules for all common applications such as emergency stop, safety doors, light grids, etc.
– Modules for monitoring various speeds during operation and downtime
– Modules for coupling digital output signals from failsafe controllers to I/O devices

Configurable safety modules
– Multifunctional evaluation module with 20 safe inputs and 4 safe outputs
– Monitoring of all the safety-related functions of a machine, such as emergency stop, safety doors, light grids, etc.
– Flexible extension with safe digital I/O modules
– Easy configuration using the SAFECONF software

Safe I/Os
– SafetyBridge I/O modules exchange safe signals via an automation network
– Flexible use: compatible with all common bus systems
– PROFIsafe I/O modules in conjunction with safe PROFIsafe controllers enable a cost-effective solution for large applications in machine building and systems manufacturing

Safe control technology
– Controls even large numbers of I/Os reliably, thanks to high-performance technology
– Reduced wiring effort, thanks to the joint transmission of control and safety protocols via a single Ethernet cable
– Uniform configuration worldwide, thanks to standardized programming according to IEC 61131
– Easily integrate safe I/O modules, thanks to Safety Plug and Play solution

Services for functional safety
Comprehensive support for all aspects of safety regarding your machinery. If you operate machinery, manufacture machinery as a whole or in parts, deal in machinery, import machinery or even integrate technical systems into machinery – we are on hand to assist you with services that are tailored to your needs.

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PSRmodular – modular safety relay system with DIN rail connector
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PSRmultifunction – safety relay for three safety functions in a single device
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Zero-speed and over-speed safety relays

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Safe coupling relays

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PSRmini – Termination Carriers for the alignment and easy mounting of highly compact coupling relays
Further information:
phoenixcontact.net/products

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Interface technology and switching devices

Your web code: #1135

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Safe design of protective functions in the process industry
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Safety relay modules for machine building – safety relays

	Type	Application							Output contacts				Safety approval		Overall width	Page
													PL according to EN ISO 13849-1	SILCL according to EN 62061	in mm	
PSRmini	**PSR-MS20**[1] 24 V DC	X	X	-	X	-	-	A	1	-	-	1	c[4]	1[4]	6.8	247
	PSR-MS21[1] 24 V DC	Coupling module for safe controllers						A	1	-	-	1	e	3	6.8	251
	PSR-MS25[1] 24 V DC	X	X	-	X	-	-	M	1	-	-	1	c[4]	1[4]	6.8	247
	PSR-MS30 24 V DC	X	X	-	X	-	X	A	1	-	-	-	e	3	6.8	248
	PSR-MS35 24 V DC	X	X	-	X	-	X	M	1	-	-	-	e	3	6.8	248
	PSR-MS40[3] 24 V DC	X	X	-	-	-	X	A	1	-	-	1	e	3	6.8	249
	PSR-MS45[3] 24 V DC	X	X	-	-	-	X	M	1	-	-	1	e	3	6.8	249
	PSR-MS50[2] 24 V DC	-	X	-	X	-	-	A	1	-	-	1	e	3	6.8	250
	PSR-MS55[2] 24 V DC	-	X	-	X	-	-	M	1	-	-	1	e	3	6.8	250
	PSR-MS60[3] 24 V DC	X	X	X	X	-	X	A	2	-	-	-	e	3	6.8	251
	PSR-MC20[1] 24 V DC	X	X	-	X	-	-	A/M	3	-	-	1	c[4]	1[4]	12.5	252
	PSR-MC30 24 V DC	X	X	-	X	-	X	A/M	2	-	-	1	e	3	12.5	253
	PSR-MC32 24...230 V AC/DC	X	X	X	X	-	X	A/M	3	-	1	-	e	3	22.5	253
	PSR-MC34 24 V DC	X	X	-	X	-	X	A/M	3	-	-	1	e	3	12.5	254
	PSR-MC37 24 V DC	X	X	-	X	-	X	A	3	-	1	1	e	3[5]	22.5	254
	PSR-MC40[3] 24 V DC	X	X	X	X	-	X	A/M	3	-	-	1	e	3	12.5	255
	PSR-MC50[2] 24 V DC	X	X	-	X	-	-	A/M	3	-	-	1	e	3	12.5	256
	PSR-MC60[8] 24 V DC	-	-	-	-	X	-	A	2	-	-	1	c	1	12.5	257
	PSR-MC62[9] 24 V DC	-	-	-	-	X	-	A	2	-	-	1	e	3	12.5	257
	PSR-MC70 24 V DC	X	X	X	X	-	X	A/M	1	1	-	1	c[4]	1[4]	12.5	258
	PSR-MC72 24 V DC	X	X	X	X	-	X	A/M	1	1	-	1	e	3	12.5	258
	PSR-MC82 24 V DC	Contact extension						A	5	-	1	1	e[6]	3[6]	17.5	259
PSRclassic	**PSR-ESA2-B** 24 V AC/DC	X	X	-	-	-	-	A	4	-	1	-	c[4]	1[4]	22.5	260
	PSR-ESAM2/3X1-B 230 V AC	X	X	-	-	-	-	A/M	3	-	1	-	c[4]	1[4]	22.5	260
	PSR-ESAM4/2X1 24 V AC/DC	X	X	-	-	-	-	A/M	2	-	1	-	e	3	22.5	260
	PSR-ESAM4/3X1-B Voltage types	X	X	-	-	-	-	A/M	3	-	1	-	e	3	22.5	260
	PSR-ESAM4/8X1 24 V AC/DC	X	X	-	-	-	-	A/M	8	-	1	-	e	3	45	260
	PSR-ESD-30 24 V DC	X	X	X	X	-	X	A/M	2	2	1	-	e	3	22.5	261
	PSR-ESD-300 24 V DC	X	X	X	-	-	X	A/M	3	2	1	-	e[7]	3[7]	45	261
	PSR-ESD-T 24 V DC	X	X	X	-	-	X	A/M	3	2	1	-	e[7]	3[7]	45	261
	PSR-ESL4[3] 24 V AC/DC	X	X	X	-	-	X	A/M	3	-	1	-	e	3	22.5	262
	PSR-THC4[9] 24 V AC/DC	-	X	-	-	X	-	A	2	-	1	-	e	3	22.5	262
	PSR-URML4 24 V DC	Contact extension for OSSD signals							3	-	1	-	e	3	22.5	263
	PSR-URM4 42...230 V AC/DC	Contact extension							4	-	2	-	e[6]	3[6]	22.5	263
	PSR-URM4 24 V AC/DC	Contact extension							5	-	2	-	e[6]	3[6]	22.5	263
	PSR-URM4-B 24 V AC/DC	Contact extension							5	-	2	-	e[6]	3[6]	22.5	263

[1]) 1-channel sensor circuit
[2]) Non-equivalent sensor circuit
[3]) Without cross-circuit detection
[4]) Depending on the application up to PL e/SILCL 3 possible
[5]) EN-81 approval
[6]) In conjunction with suitable evaluating device
[7]) Undelayed contacts: Cat. 4/PL e, SILCL 3
dropout-delayed contacts: Cat. 3/PL d, SILCL 2
[8]) Type IIIA according to EN 574
[9]) Type IIIC according to EN 574
A = Automatic start
M = Manual, monitored start

Safety relay modules for machine building – safety relays

	Type	Application							Output contacts				Safety approval		Page
													PL according to EN ISO 13849-1	SILCL according to EN 62061	
PSRmodular	**PSR-SDC4** 24 V DC	X	X	X	X	-	X	A/M	2	-		1	e	3	265
	PSR-URM4/B 24 V DC	Contact extension							4	-	2	-	e	3	265
	PSR-URD3/3 24 V DC	Contact extension							-	4	2[1])	-	d	2	265
	PSR-URD3/30 24 V DC	Contact extension							-	4	2[1])	-	d	2	265
	PSR-URD3/T2 24 V DC	Contact extension							-	4	2[1])	-	d	2	265
	PSR-SIM4														265
	PSR-SACB...														265
PSRmultifunction	**PSR-MXF1** 24 V DC	X	X	-	-	-	-	A/M	4	-	2	-	e	3	266
	PSR-MXF2 24 V DC	X	-	-	X	-	-	A/M	4	-	2	-	e	3	266
	PSR-MXF3 24 V DC	X	X	X	-	-	X	A/M	4	-	2	-	e	3	266
	PSR-MXF4 24 V DC	X	-	X	X	-	X	A/M	4	-	2	-	e	3	266

[1]) Delayed
A = Automatic start
M = Manual, monitored start

Safety relay modules for speed and downtime monitoring

	Type	Application					Output contacts		Safety approval			Page
					n=0	$n>n_{max}$			Cat. according to EN ISO 13849-1	PL according to EN ISO 13849-1	SILCL according to EN 62061	
PSRmotion	**PSR-RSM4** 24 V DC	-	X	X	X	X	4	3	4	e	3	275
	PSR-MM25 24 V DC	X	-	-	X	-	1	2	3	e	3	276

Safety relay modules – safe coupling relays

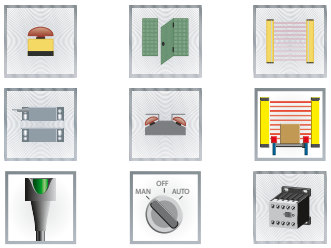
	Type	Application	Output contacts			Safety approval		Page
						PL according to EN ISO 13849-1	SILCL according to EN 62061	
PSRclassic	**PSR-URM** 24 V AC/DC 120 V AC/DC	Coupling relays for universal applications	5	2	-	c	1	277
	PSR-URM/5X1 24 V AC/DC		5	1	-	c	1	278
	PSR-URM/3X1 24 V AC/DC		3	3	-	c	1	278
	PSR-URM/4X1 24 V AC/DC		4	2	-	c	1	279
	PSR-URM/2X21 24 V AC/DC 120 V AC/DC		-	-	2	c	1	279

Safety relay modules for the process industry – safe coupling relays

	Type	Application	Output contacts			Diagnostic/ proof test				Safety approval					Overall width	Page
		Highly compact, safe coupling relays for failsafe controllers:				Visual via LED	Active error acknowledgment via A1	Measurement on the device	Self-monitoring with integrated interlock	SIL according to IEC 61508/61511	SIL according to IEC 50156	ATEX/IECEx/Class I Zone 2	G3 according to ANSI/ISA-S71.04	GL	in mm	
PSRmini	**PSR-PS20** 24 V DC	For safety-related switching off (ESD)	1	1	1	X	X	X	-	3	3	X	X	X	6.8	281
	PSR-PS21 24 V DC		1	1	1	X	X	X	-	2	2	X	X	X	6.8	281
	PSR-PS22 24 V DC		1	1	-	X	X	X	-	3	3	X	X	X	6.8	282
	PSR-PS40 24 V DC		1	-	1	X	-	-	X	3	3	X	X	X	12.5	283
	PSR-PC20 24 V DC		1	1	1	X	X	X	-	3	3	X	X	X	17.5	284
	PSR-PC32 24 V DC		2	1	-	X	-	X	-	3	3	X	X	X	17.5	284
	PSR-PC40 24 V DC		2	-	1	X	X	-	X	3	3	X	X	X	12.5	283
	PSR-PC50 24 V DC	For safety-related switching on (F&G)	1	-	1	-	X	X	-	3[1])	-	X	-	X	17.5	285
PSRclassic	**PSR-FSP** 24 V DC	For safety-related switching off (ESD)	1	1	-	-	-	X	-	3	3	-	-	X	17.5	286
	PSR-FSP/2X1 24 V DC		2	1	-	-	-	X	-	3	3	-	-	X	17.5	287
	PSR-FSP2/2X1 24 V DC		2	1	-	-	-	X	-	2	2	-	-	X	17.5	287
	PSR-ESP4 24 V DC		2	1	-	-	-	-	X	3	-	-	-	X	22.5	288

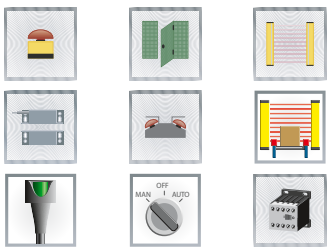
[1]) Low demand

Configurable safety modules

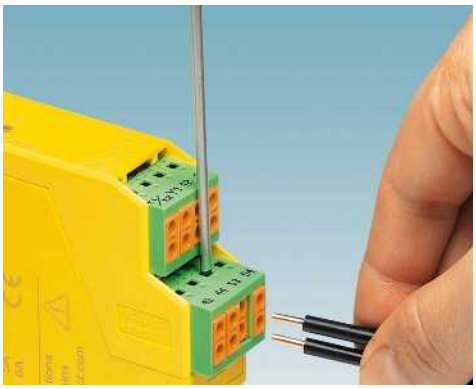
	Type	Application	Inputs/outputs					Safety approval					Page
			Inputs	Safe control outputs	Grounded switching outputs	Clock outputs	Signal outputs	Category according to EN ISO 13849-1	PL according to EN ISO 13849-1	SILCL according to EN 62061	SIL according to IEC 61508	SIL according to IEC 50156	
TRISAFE	**PSR-TRISAFE-S** 24 V DC	Master module (not extendable)	20	4	2	2	4	4	e	3	3	3	292
TRISAFE	**PSR-TRISAFE-M** 24 V DC	Master module (safely extendable)	20	4	2	2	4	4	e	3	3	3	293
TRISAFE	**PSR-TS-SDI8-SDIO4** 24 V DC	Safe digital I/O extension module	8	4[1])	-	2[1])	2[1])	4	e	3	3	3	294
TRISAFE	**PSR-TS-SDOR4** 24 V DC	Safe relay module	-	4[3])	-	-	4	4[2])	e[2])	3[2])	3[2])	3	294

[1]) Configurable via software: outputs to inputs/alarm outputs to clock outputs
[2]) Depending on connection, up to ...
[3]) Configurable via software: 4 x 1-channel or 2 x 2-channel

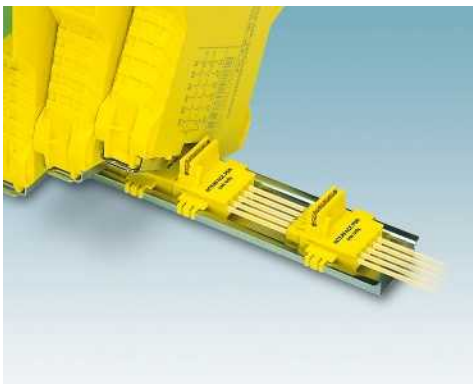
Safe I/Os

	Type	Application	Inputs/outputs				Protocol		Safety approval				Page
			Safe inputs	Safe outputs	Clock outputs	Relay outputs	SafetyBridge technology	PROFIsafe	Category according to EN ISO 13849-1	PL according to EN ISO 13849-1	SILCL according to EN 62061	SIL according to IEC 61508	
Logic modules	**IB IL 24 LPSDO 8 V2-PAC** 24 V DC	Logic module with SafetyBridgeTechnology V2	-	8	-	-	X	-	4	e	3	3	296
Logic modules	**IB IL 24 LPSDO 8 V3-PAC** 24 V DC	Logic module with SafetyBridgeTechnology V3	-	8	-	-	X	-	4	e	3	3	296
Logic modules	**AXL F LPSDO8/3 IF** 24 V DC	Logic module with SafetyBridgeTechnology V3	-	8	-	-	X	-	4	e	3	3	300
Safe I/Os for Inline	**IB IL 24 PSDI 8-PAC** 24 V DC	Input module	8	-	8	-	X	X	4	e	3	3	297
Safe I/Os for Inline	**IB IL 24 PSDI 16-PAC** 24 V DC	Input module [1])	16	-	16	-	X	X	4	e	3	3	297
Safe I/Os for Inline	**IB IL 24 PSDO 8-PAC** 24 V DC	Output module	-	8	-	-	X	X	4	e	3	3	298
Safe I/Os for Inline	**IB IL 24 PSDO 4/4-PAC** 24 V DC	Output module (positive and negative switching)	-	4	-	-	X	X	4	e	3	3	299
Safe I/Os for Inline	**IB IL 24 PSDOR 4-PAC** 24 V DC/230 V DC	Relay module	-	-	-	4	X	X	4	e	3	3	299
Safe I/Os for Inline	**IB IL SAFE 2-ECO** 24 V DC	Input module with two sensor circuits	-	-	-	-	-	-	4	e	3	3	299
Safe I/Os for Axioline F	**AXL F SSDI8/4 1F** 24 V DC	Input module	8	-	-	-	X	-	4	e	3	3	301
Safe I/Os for Axioline F	**AXL F SSDO8/3 1F** 24 V DC	Output module	-	8	-	-	X	-	4	e	3	3	301
Safe I/Os for Axioline F	**AXL F PSDI8/4 1F** 24 V DC	Input module	8	-	-	-	-	X	4	e	3	3	302
Safe I/Os for Axioline F	**AXL F PSDO8/3 1F** 24 V DC	Output module	-	8	-	-	-	X	4	e	3	3	303

[1]) Only compatible with IB IL 24 LPSDO V3-PAC



User-friendly connection technology



Quick extension

Numerous approvals

Our PSR safety relays demonstrate that innovative safety solutions do not necessarily have to be complex in order to meet the high requirements of machine building and systems manufacturing.

As well as offering easy integration and handling, the modules are characterized by their compact, space-saving design as well as their high quality, safety, and reliability.

In particular, safety applications can be implemented under optimal cost-benefit conditions with the new PSRmini safety relay range.

PSR safety relays offer you solutions for all common applications such as monitoring the following protective tasks:
– Emergency stop
– Safety door
– Light grid
– Solenoid switch
– Two-hand control devices
– Enable switch

Convenient connection technology

The majority of PSR safety relays are available with plug-in screw or spring-cage connection technology. The TWIN spring-cage connectors provide enough space for two cables per terminal point.

Quick extension

The modular safety systems allow additional extension modules to be integrated easily using the PSR-TBUS DIN rail connector. As a result, there is no longer any need to install cross-wiring for additional output contacts.

Numerous approvals

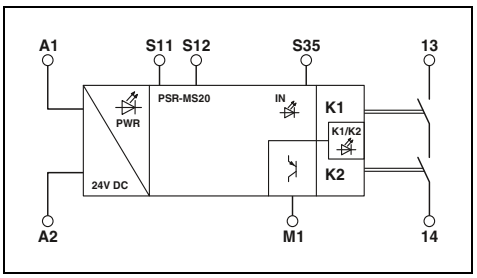
PSR safety relays conform to all applicable safety standards such as EN ISO 13849-1 and IEC 62061. In addition, modules with GL approval or certification according to EN 50156 are also available.

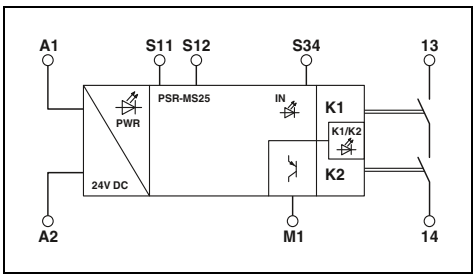
Highly compact safety relays for emergency stop and safety door monitoring

- Single-channel control
- 1 enabling current path, 1 digital signal output
- Basic insulation/reinforced insulation in part
- Activation depending on type: automatic or manual, monitored
- Cat. 1/PL c according to EN ISO 13849-1, SILCL 1 according to IEC 62061
- Depending on the application up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061

Automatic activation

Manual and monitored activation





		Technical data	Technical data
Input data			
Rated control supply voltage U_S		24 V DC -15 % / +10 %	24 V DC -15 % / +10 %
Rated control supply current I_S		typ. 42 mA	typ. 42 mA
Typical response time		< 175 ms	< 175 ms
Typical release time		< 20 ms (when controlled via A1 or S12)	< 20 ms (when controlled via A1 or S12)
Recovery time		< 500 ms	< 500 ms
Output data			
Contact type		1 enabling current path	1 enabling current path
Contact material		$AgSnO_2$	$AgSnO_2$
Max./min. switching voltage		250 V AC/DC / 12 V AC/DC	250 V AC/DC / 12 V AC/DC
Limiting continuous current		6 A (observe derating)	6 A (observe derating)
Max./min. inrush current		6 A / 3 mA	6 A / 3 mA
Switching capacity		min. 60 mW	min. 60 mW
Short-circuit protection of the output circuits		6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)	6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)
Alarm outputs			
Number of outputs		1 (digital, PNP)	1 (digital, PNP)
Output current		max. 100 mA	max. 100 mA
Short-circuit protection		no	no
General data			
Ambient temperature range		-40 °C ... 60 °C (observe derating)	-40 °C ... 60 °C (observe derating)
Air and creepage distances between the circuits		DIN EN 50178	DIN EN 50178
Rated surge voltage/insulation		Safe isolation, reinforced insulation 6 kV between input circuit and enabling current path Basic insulation 4 kV between all current paths and housing	Safe isolation, reinforced insulation 6 kV between input circuit and enabling current path Basic insulation 4 kV between all current paths and housing
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 26 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 26 - 12
Dimensions	W / H / D	6.8 mm / 93.1 mm / 102.5 mm	6.8 mm / 93.1 mm / 102.5 mm
EMC note		Class A product, see page 525	Class A product, see page 525

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Emergency stop and safety door monitoring						
	PSR-MS20-1NO-1DO-24DC-SC	2904950	1	**PSR-MS25-1NO-1DO-24DC-SC**	2904951	1

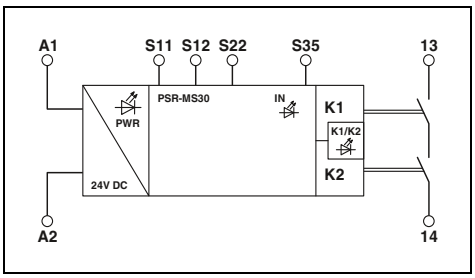
Safety relay modules for machine building – PSRmini

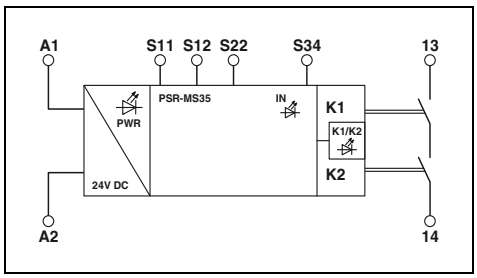
Highly compact safety relays for emergency stop and safety door monitoring

– Two-channel control
– 1 enabling current path
– Basic insulation/reinforced insulation in part
– Cross-circuit detection
– Activation depending on type: automatic or manual, monitored
– Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061

Automatic activation

Manual and monitored activation





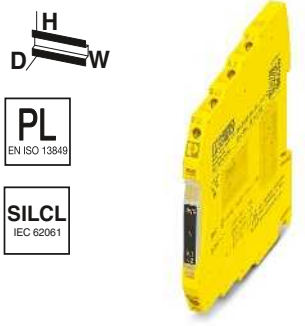
		Technical data	Technical data
Input data			
Rated control supply voltage U_S		24 V DC -15 % / +10 %	24 V DC -15 % / +10 %
Rated control supply current I_S		typ. 42 mA	typ. 42 mA
Typical response time		< 175 ms	< 175 ms
Typical release time		< 20 ms (when controlled via A1 or S12 and S22.)	< 20 ms (when controlled via A1 or S12 and S22.)
Recovery time		< 500 ms	< 500 ms
Output data			
Contact type		1 enabling current path	1 enabling current path
Contact material		$AgSnO_2$	$AgSnO_2$
Max./min. switching voltage		250 V AC/DC / 12 V AC/DC	250 V AC/DC / 12 V AC/DC
Limiting continuous current		6 A (observe derating)	6 A (observe derating)
Max./min. inrush current		6 A / 3 mA	6 A / 3 mA
Switching capacity		min. 60 mW	min. 60 mW
Short-circuit protection of the output circuits		6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)	6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)
General data			
Ambient temperature range		-40 °C ... 60 °C (observe derating)	-40 °C ... 60 °C (observe derating)
Air and creepage distances between the circuits		DIN EN 50178	DIN EN 50178
Rated surge voltage/insulation		Safe isolation, reinforced insulation 6 kV between input circuit and enabling current path Basic insulation 4 kV between all current paths and housing	Safe isolation, reinforced insulation 6 kV between input circuit and enabling current path Basic insulation 4 kV between all current paths and housing
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 26 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 26 - 12
Dimensions	W / H / D	6.8 mm / 93.1 mm / 102.5 mm	6.8 mm / 93.1 mm / 102.5 mm
EMC note		Class A product, see page 525	Class A product, see page 525

	Ordering data			Ordering data		
Description	**Type**	**Order No.**	Pcs./Pkt.	**Type**	**Order No.**	Pcs./Pkt.
Emergency stop and safety door monitoring						
	PSR-MS30-1NO-24DC-SC	2904952	1	**PSR-MS35-1NO-24DC-SC**	2904953	1

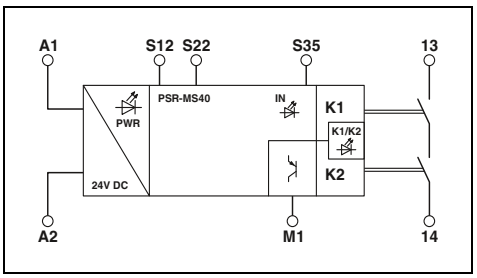
Highly compact safety relays for emergency stop and safety door monitoring

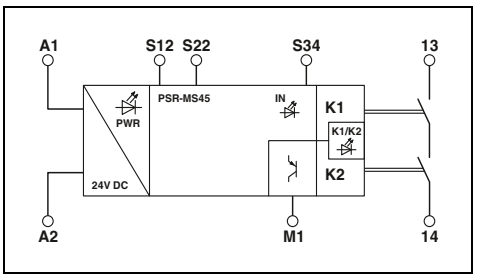
– Two-channel control
– 1 enabling current path, 1 digital signal output
– Basic insulation/reinforced insulation in part
– Activation depending on type: automatic or manual, monitored
– Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061

Automatic activation



Manual and monitored activation





		Technical data	Technical data
Input data			
Rated control supply voltage U_S		24 V DC -15 % / +10 %	24 V DC -15 % / +10 %
Rated control supply current I_S		typ. 42 mA	typ. 42 mA
Typical response time		< 175 ms	< 175 ms
Typical release time		< 20 ms (when controlled via A1 or S12 and S22.)	< 20 ms (when controlled via A1 or S12 and S22.)
Recovery time		< 500 ms	< 500 ms
Output data			
Contact type		1 enabling current path	1 enabling current path
Contact material		$AgSnO_2$	$AgSnO_2$
Max./min. switching voltage		250 V AC/DC / 12 V AC/DC	250 V AC/DC / 12 V AC/DC
Limiting continuous current		6 A (observe derating)	6 A (observe derating)
Max./min. inrush current		6 A / 3 mA	6 A / 3 mA
Switching capacity		min. 60 mW	min. 60 mW
Short-circuit protection of the output circuits		6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)	6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)
Alarm outputs			
Number of outputs		1 (digital, PNP)	1 (digital, PNP)
Output current		max. 100 mA	max. 100 mA
Short-circuit protection		no	no
General data			
Ambient temperature range		-40 °C ... 60 °C (observe derating)	-40 °C ... 60 °C (observe derating)
Air and creepage distances between the circuits		DIN EN 50178	DIN EN 50178
Rated surge voltage/insulation		Safe isolation, reinforced insulation 6 kV between input circuit and enabling current path Basic insulation 4 kV between all current paths and housing	Safe isolation, reinforced insulation 6 kV between input circuit and enabling current path Basic insulation 4 kV between all current paths and housing
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 26 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 26 - 12
Dimensions	W / H / D	6.8 mm / 93.1 mm / 102.5 mm	6.8 mm / 93.1 mm / 102.5 mm
EMC note		Class A product, see page 525	Class A product, see page 525

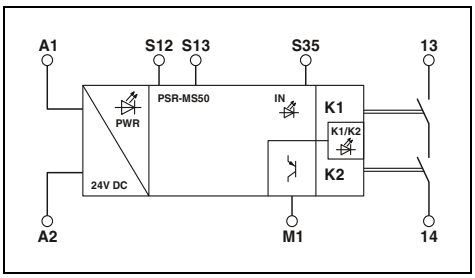
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Emergency stop and safety door monitoring						
	PSR-MS40-1NO-1DO-24DC-SC	2904954	1	**PSR-MS45-1NO-1DO-24DC-SC**	2904955	1

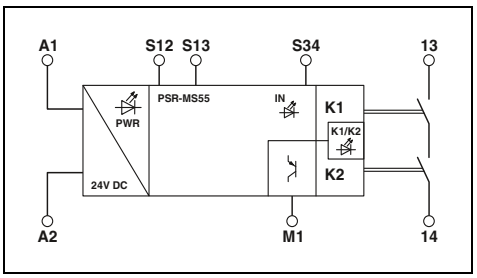
Highly compact safety relays for monitoring non-equivalent signal generators

- Two-channel non-equivalent control
- 1 enabling current path, 1 digital signal output
- Basic insulation/reinforced insulation in part
- Activation depending on type: automatic or manual, monitored
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061

Automatic activation

Manual and monitored activation





	Technical data	Technical data
Input data		
Rated control supply voltage U_S	24 V DC -15 % / +10 %	24 V DC -15 % / +10 %
Rated control supply current I_S	typ. 42 mA	typ. 42 mA
Typical response time	< 175 ms	< 175 ms
Typical release time	< 20 ms (when controlled via A1 or S12 and S13.)	< 20 ms (when controlled via A1 or S12 and S13.)
Recovery time	< 500 ms	< 500 ms
Output data		
Contact type	1 enabling current path	1 enabling current path
Contact material	$AgSnO_2$	$AgSnO_2$
Max./min. switching voltage	250 V AC/DC / 12 V AC/DC	250 V AC/DC / 12 V AC/DC
Limiting continuous current	6 A (observe derating)	6 A (observe derating)
Max./min. inrush current	6 A / 3 mA	6 A / 3 mA
Switching capacity	min. 60 mW	min. 60 mW
Short-circuit protection of the output circuits	6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)	6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)
Alarm outputs		
Number of outputs	1 (digital, PNP)	1 (digital, PNP)
Output current	max. 100 mA	max. 100 mA
Short-circuit protection	no	no
General data		
Ambient temperature range	-40 °C ... 60 °C (observe derating)	-40 °C ... 60 °C (observe derating)
Air and creepage distances between the circuits	DIN EN 50178	DIN EN 50178
Rated surge voltage/insulation	Safe isolation, reinforced insulation 6 kV between input circuit and enabling current path Basic insulation 4 kV between all current paths and housing	Safe isolation, reinforced insulation 6 kV between input circuit and enabling current path Basic insulation 4 kV between all current paths and housing
Screw connection solid/stranded/AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 26 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 26 - 12
Dimensions W / H / D	6.8 mm / 93.1 mm / 102.5 mm	6.8 mm / 93.1 mm / 102.5 mm
EMC note	Class A product, see page 525	Class A product, see page 525

Description	Ordering data Type	Order No.	Pcs./Pkt.	Ordering data Type	Order No.	Pcs./Pkt.
Monitoring non-equivalent signal generators						
	PSR-MS50-1NO-1DO-24DC-SC	2904956	1	**PSR-MS55-1NO-1DO-24DC-SC**	2904957	1

Highly compact safety relays

- Basic insulation/reinforced insulation in part
- Automatic activation
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061

PSR-MS60: emergency stop, safety door, and light grid monitoring

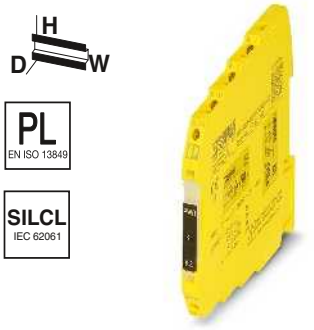
- Two-channel control
- 2 single-channel enabling current paths

PSR-MS21: monitoring failsafe controllers

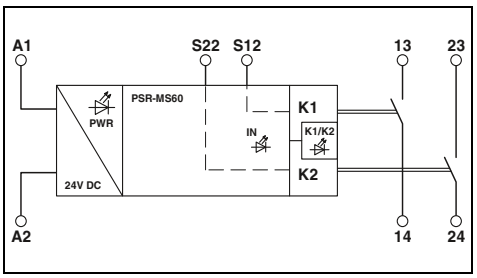
- Single-channel control
- 1 enabling current path, 1 digital signal output

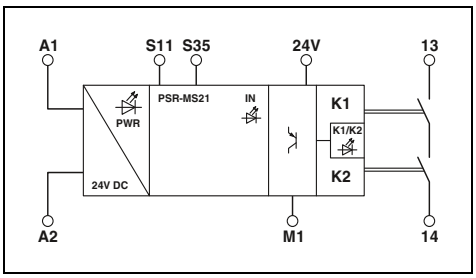
new

Automatic activation, 2 single-channel enabling current paths



Automatic activation, 1 enabling current path





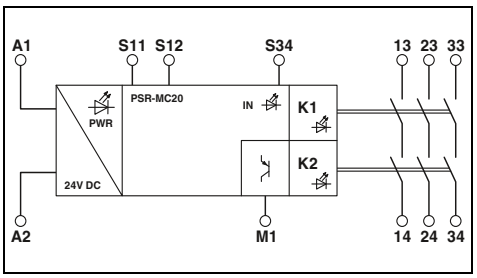
	Technical data	Technical data
Input data		
Rated control supply voltage U_S	24 V DC -15 % / +10 %	24 V DC -20 % / +25 % (at A1)
Rated control supply current I_S	typ. 40 mA	typ. 35 mA
Typical response time	< 175 ms	< 150 ms (automatic start)
Typical release time	< 20 ms (when controlled via A1 or S12 and S22.)	< 20 ms (when controlled via A1)
Recovery time	< 500 ms	< 500 ms
Output data		
Contact type	2 enabling current paths	1 enabling current path
Contact material	$AgSnO_2$	$AgSnO_2$
Max./min. switching voltage	250 V AC/DC / 12 V AC/DC	250 V AC/DC / 12 V AC/DC
Limiting continuous current	6 A (observe derating)	6 A (observe derating)
Max./min. inrush current	6 A / 3 mA	6 A / 3 mA
Switching capacity	min. 60 mW	min. 60 mW
Short-circuit protection of the output circuits	6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)	6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)
Alarm outputs		
Number of outputs	-	1 (digital, PNP)
Output current	-	max. 100 mA
Short-circuit protection	-	Yes
General data		
Ambient temperature range	-40 °C ... 55 °C (observe derating)	-40 °C ... 60 °C (observe derating)
Air and creepage distances between the circuits	DIN EN 50178	DIN EN 50178
Rated surge voltage/insulation	Safe isolation, reinforced insulation 6 kV between input circuit and enabling current path (13/14) and enabling current path (23/24) Basic insulation 4 kV between all current paths and housing	Safe isolation, reinforced insulation 6 kV between input circuit and enabling current path (13/14) Basic insulation 4 kV between all current paths and housing
Screw connection solid/stranded/AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 26 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 26 - 12
Dimensions W / H / D	6.8 mm / 93.1 mm / 102.5 mm	6.8 mm / 93.1 mm / 102.5 mm
EMC note	Class A product, see page 525	Class A product, see page 525

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Emergency stop, safety door, and light grid monitoring						
	PSR-MS60-2NO-24DC-SC	2904958	1			
Monitoring failsafe controllers						
				PSR-MS21-1NO-1DO-24DC-SC	2702192	1

Highly compact safety relays for emergency stop and safety door monitoring

– Single-channel control
– 3 enabling current paths, 1 digital signal output
– Basic insulation/reinforced insulation in part
– Manual, monitored, and automatic activation in a single device
– Cat. 1/PL c according to EN ISO 13849-1, SILCL 1 according to IEC 62061
– Depending on the application up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061

3 enabling current paths



Technical data

Input data		
Rated control supply voltage U_S		24 V DC -15 % / +10 %
Rated control supply current I_S		typ. 80 mA
Typical response time		< 175 ms (automatic start) < 175 ms (manual, monitored start)
Typical release time		< 20 ms (when controlled via A1 or S12)
Recovery time		< 500 ms
Output data		
Contact type		3 enabling current paths
Contact material		$AgSnO_2$
Max./min. switching voltage		250 V AC/DC / 12 V AC/DC
Limiting continuous current		6 A (observe derating)
Max./min. inrush current		6 A / 3 mA
Switching capacity		min. 60 mW
Short-circuit protection of the output circuits		6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)
Alarm outputs		
Number of outputs		1 (digital, PNP)
Output current		max. 100 mA
Short-circuit protection		no
General data		
Ambient temperature range		-40 °C ... 55 °C (observe derating)
Air and creepage distances between the circuits		DIN EN 50178
Rated surge voltage/insulation		Safe isolation, reinforced insulation 6 kV between input circuit and enabling current path (13/14) and enabling current path (23/24) and enabling current path (33/34) Basic insulation 4 kV between all current paths and housing
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid / stranded / AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	12.5 mm / 112.2 mm / 114.5 mm
W / H / D	Spring-cage version	12.5 mm / 116.6 mm / 114.5 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Emergency stop and safety door monitoring			
with screw connection	**PSR-MC20-3NO-1DO-24DC-SC**	2700466	1
with spring-cage connection	**PSR-MC20-3NO-1DO-24DC-SP**	2700467	1

Highly compact safety relays

new

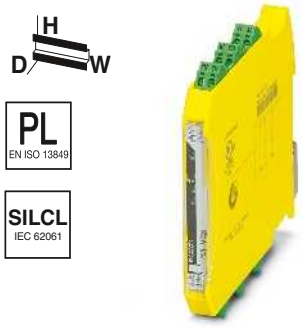
- Two-channel control
- Basic insulation/reinforced insulation in part
- Manual, monitored, and automatic activation in a single device
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061

PSR-MC30: emergency stop and safety door monitoring

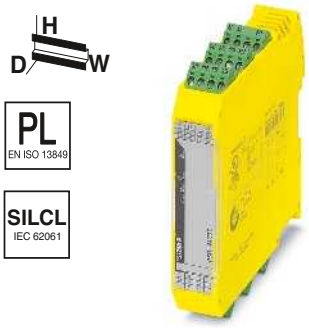
- 2 enabling current paths, 1 digital signal output
- Cross-circuit detection

PSR-MC32: emergency stop, safety door, and light grid monitoring

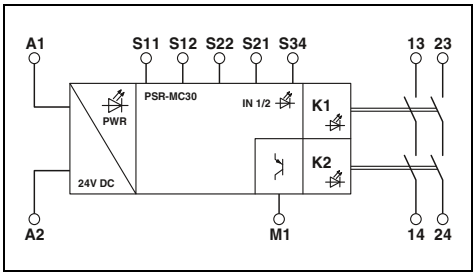
- 3 enabling current paths, 1 signaling current path
- Wide-range input

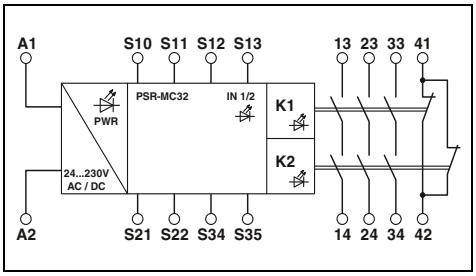


2 enabling current paths



3 enabling current paths, 1 signaling current path





	Technical data	Technical data
Input data		
Rated control supply voltage U_S	24 V DC -15 % / +10 %	24 V AC/DC ... 230 V AC/DC -15 % / +10 %
Rated control supply current I_S	typ. 65 mA	typ. 103 mA (24 V DC)
Typical response time	< 175 ms (automatic start) < 175 ms (manual, monitored start)	< 150 ms (automatic start) < 100 ms (manual, monitored start)
Typical release time	< 20 ms (when controlled via A1 or S12 and S22.)	< 20 ms (when actuation is via the sensor circuit)
Recovery time	< 500 ms	< 500 ms
Output data		
Contact type	2 enabling current paths	3 enabling current paths
Contact material	$AgSnO_2$	$AgSnO_2$
Max./min. switching voltage	250 V AC/DC / 12 V AC/DC	250 V AC/DC / 5 V AC/DC
Limiting continuous current	6 A (observe derating)	6 A
Max./min. inrush current	6 A / 3 mA	6 A / 10 mA
Switching capacity	min. 60 mW	min. 50 mW
Short-circuit protection of the output circuits	6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)	6 A gL/gG 4 A gL/gG (for low-demand applications)
Alarm outputs		
Number of outputs	1 (digital, PNP)	-
Output current	max. 100 mA	-
Short-circuit protection	no	-
General data		
Ambient temperature range	-40 °C ... 55 °C (observe derating)	-40 °C ... 55 °C (observe derating)
Air and creepage distances between the circuits	DIN EN 50178	DIN EN 50178; EN 60947-5-1
Rated surge voltage/insulation	Safe isolation, reinforced insulation 6 kV between input circuit and enabling current path (13/14) and enabling current path (23/24) Basic insulation 4 kV between all current paths and housing	Basic insulation 4 kV between enabling current path (23/24) and enabling current path (33/34) and signaling current path (41/42) Basic insulation 4 kV between all current paths and housing Safe isolation, reinforced insulation 6 kV between all other circuits
Screw connection solid/stranded/AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid / stranded / AWG	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions Screw version	12.5 mm / 112.2 mm / 114.5 mm	22.5 mm / 112.2 mm / 114.5 mm
W / H / D Spring-cage version	12.5 mm / 116.6 mm / 114.5 mm	22.5 mm / 117.4 mm / 114.5 mm
EMC note	Class A product, see page 525	Class A product, see page 525

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Emergency stop and safety door monitoring						
with screw connection	**PSR-MC30-2NO-1DO-24DC-SC**	2700498	1			
with spring-cage connection	**PSR-MC30-2NO-1DO-24DC-SP**	2700499	1			
Emergency stop, safety door, and light grid monitoring						
with screw connection				**PSR-MC32-3NO-1NC-24-230UC-SC**	2700524	1
with spring-cage connection				**PSR-MC32-3NO-1NC-24-230UC-SP**	2700525	1

Safety relay modules for machine building – PSRmini

Highly compact safety relays

- Two-channel control
- 3 enabling current paths, 1 digital signal output
- Cross-circuit detection
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061

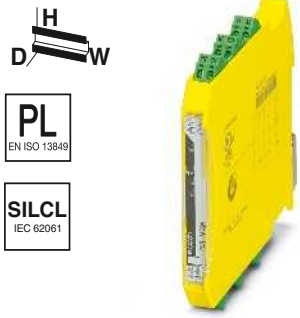
PSR-MC34: emergency stop and safety door monitoring

- Basic insulation/reinforced insulation in part
- Manual, monitored, and automatic activation in a single device

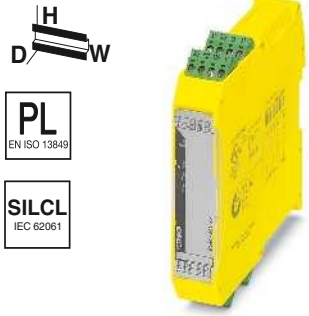
PSR-MC37: emergency stop, safety door, and lift monitoring

- Basic insulation
- Manual and automatic activation in a single device
- Approved for lift applications according to EN 81-20

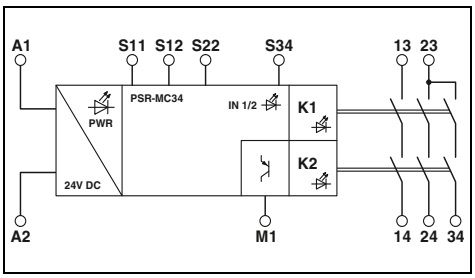
new

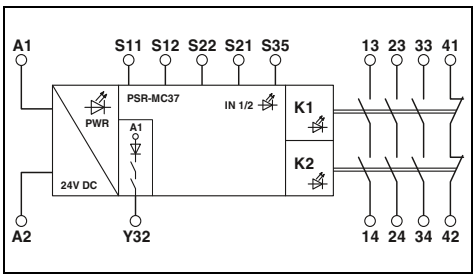


3 enabling current paths



3 enabling current paths, 1 confirmation current path, with lift approval according to EN 81-20



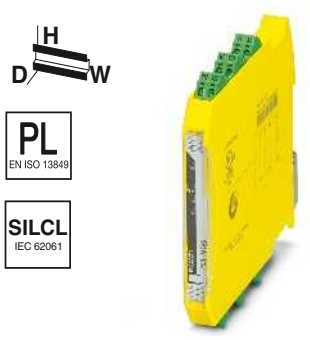


	Technical data	Technical data
Input data		
Rated control supply voltage U_S	24 V DC -15 % / +10 %	24 V DC -20 % / +25 %
Rated control supply current I_S	typ. 84 mA	typ. 70 mA
Typical response time	< 175 ms (automatic start) < 175 ms (manual, monitored start)	< 100 ms (automatic start)
Typical release time	< 20 ms (when controlled via A1 or S12 and S22.)	< 20 ms (when controlled via A1 or S12)
Recovery time	< 500 ms	< 500 ms
Output data		
Contact type	3 enabling current paths	3 enabling current paths
Contact material	$AgSnO_2$	$AgSnO_2$
Max./min. switching voltage	250 V AC/DC / 12 V AC/DC	250 V AC/DC / 5 V AC/DC
Limiting continuous current	6 A (observe derating)	6 A (N/O contact, pay attention to the derating) , 1 A (N/C contact)
Max./min. inrush current	6 A / 3 mA	6 A / 10 mA
Switching capacity	min. 60 mW	min. 50 mW
Short-circuit protection of the output circuits	6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)	6 A gL/gG (N/O contact) 1 A gL/gG (N/C contact)
Alarm outputs		
Number of outputs	1 (digital, PNP)	1 (digital)
Output current	max. 100 mA	max. 100 mA
Short-circuit protection	no	Yes
General data		
Ambient temperature range	-40 °C ... 55 °C (observe derating)	-40 °C ... 60 °C (observe derating)
Air and creepage distances between the circuits	DIN EN 50178	DIN EN 60664-1:2008
Rated surge voltage/insulation	Basic insulation 4 kV: Between input circuit and enabling current path (23/24/34) Between all current paths and housing Safe isolation, reinforced insulation 6 kV: Between input circuit and enabling current path (13/14) Between enabling current path (13/14) and enabling current path (23/24/34)	Basic insulation 4 kV between all current paths Basic insulation 4 kV between all current paths and housing
Screw connection solid/stranded/AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid / stranded / AWG	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions Screw version	12.5 mm / 112.2 mm / 114.5 mm	22.5 mm / 112.2 mm / 114.5 mm
W / H / D Spring-cage version	12.5 mm / 116.6 mm / 114.5 mm	22.5 mm / 117.4 mm / 114.5 mm
EMC note	Class A product, see page 525	Class A product, see page 525

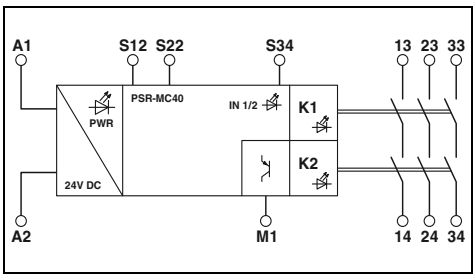
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Emergency stop and safety door monitoring						
with screw connection	**PSR-MC34-3NO-1DO-24DC-SC**	2700540	1			
with spring-cage connection	**PSR-MC34-3NO-1DO-24DC-SP**	2700548	1			
Emergency stop, safety door, and lift monitoring						
with screw connection				**PSR-MC37-3NO-1NC-24DC-SC**	2702411	1
with spring-cage connection				**PSR-MC37-3NO-1NC-24DC-SP**	2702412	1

Highly compact safety relays for emergency stop, safety door, and light grid monitoring

- Two-channel control
- 3 enabling current paths, 1 digital signal output
- Basic insulation/reinforced insulation in part
- Manual, monitored, and automatic activation in a single device
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061



3 enabling current paths



Technical data

Input data		
Rated control supply voltage U_S		24 V DC -15 % / +10 %
Rated control supply current I_S		typ. 80 mA
Typical response time		< 175 ms (automatic start) < 175 ms (manual, monitored start)
Typical release time		< 20 ms (when controlled via A1 or S12 and S22.)
Recovery time		< 500 ms
Output data		
Contact type		3 enabling current paths
Contact material		$AgSnO_2$
Max./min. switching voltage		250 V AC/DC / 12 V AC/DC
Limiting continuous current		6 A (observe derating)
Max./min. inrush current		6 A / 3 mA
Switching capacity		min. 60 mW
Short-circuit protection of the output circuits		6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)
Alarm outputs		
Number of outputs		1 (digital, PNP)
Output current		max. 100 mA
Short-circuit protection		no
General data		
Ambient temperature range		-40 °C ... 55 °C (observe derating)
Air and creepage distances between the circuits		DIN EN 50178
Rated surge voltage/insulation		Safe isolation, reinforced insulation 6 kV between input circuit and enabling current path (13/14) and enabling current path (23/24) and enabling current path (33/34) Basic insulation 4 kV between all current paths and housing
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid / stranded / AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	12.5 mm / 112.2 mm / 114.5 mm
W / H / D	Spring-cage version	12.5 mm / 116.6 mm / 114.5 mm
EMC note		Class A product, see page 525

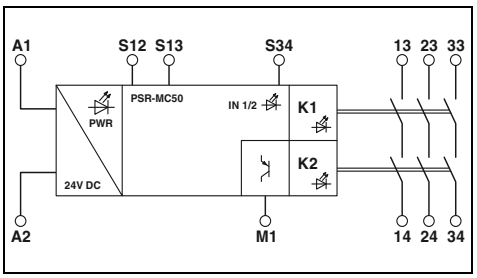
Ordering data

Description	Type	Order No.	Pcs./Pkt.
Emergency stop, safety door, and light grid monitoring			
with screw connection	**PSR-MC40-3NO-1DO-24DC-SC**	2700569	1
with spring-cage connection	**PSR-MC40-3NO-1DO-24DC-SP**	2700570	1

Highly compact safety relays for monitoring non-equivalent signal generators

– Two-channel non-equivalent control
– 3 enabling current paths, 1 digital signal output
– Basic insulation/reinforced insulation in part
– Manual, monitored, and automatic activation in a single device
– Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061

3 enabling current paths, for non-equivalent sensor circuits



Technical data

Input data		
Rated control supply voltage U_S		24 V DC -15 % / +10 %
Rated control supply current I_S		typ. 80 mA
Typical response time		< 175 ms (automatic start) < 175 ms (manual, monitored start)
Typical release time		< 20 ms (when controlled via A1 or S12 and S13.)
Recovery time		< 500 ms
Output data		
Contact type		3 enabling current paths
Contact material		$AgSnO_2$
Max./min. switching voltage		250 V AC/DC / 12 V AC/DC
Limiting continuous current		6 A (observe derating)
Max./min. inrush current		6 A / 3 mA
Switching capacity		min. 60 mW
Short-circuit protection of the output circuits		6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)
Alarm outputs		
Number of outputs		1 (digital, PNP)
Output current		max. 100 mA
Short-circuit protection		no
General data		
Ambient temperature range		-40 °C ... 55 °C (observe derating)
Air and creepage distances between the circuits		DIN EN 50178
Rated surge voltage/insulation		Safe isolation, reinforced insulation 6 kV between input circuit and enabling current path (13/14) and enabling current path (23/24) and enabling current path (33/34) Basic insulation 4 kV between all current paths and housing
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid / stranded / AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	12.5 mm / 112.2 mm / 114.5 mm
W / H / D	Spring-cage version	12.5 mm / 116.6 mm / 114.5 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Monitoring non-equivalent signal generators			
with screw connection	**PSR-MC50-3NO-1DO-24DC-SC**	2700553	1
with spring-cage connection	**PSR-MC50-3NO-1DO-24DC-SP**	2700564	1

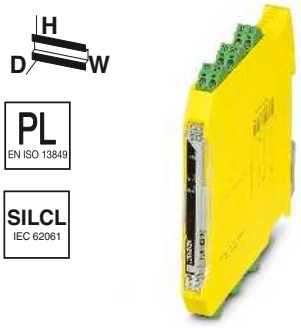
Highly compact safety relays

– 2 enabling current paths, 1 digital signal output
– Basic insulation/reinforced insulation in part
– Automatic activation

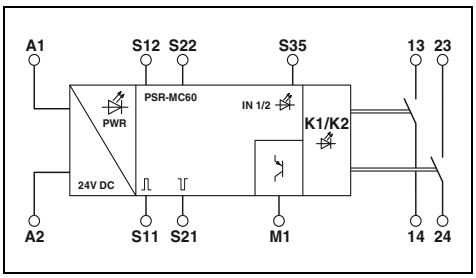
PSR-MC60:
For two-hand control devices according to EN 574 type IIIA
– Single-channel control

PSR-MC62:
For two-hand control devices according to EN 574 type IIIC
– Two-channel control

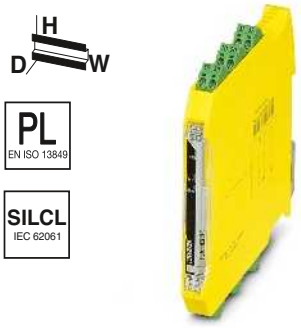
new



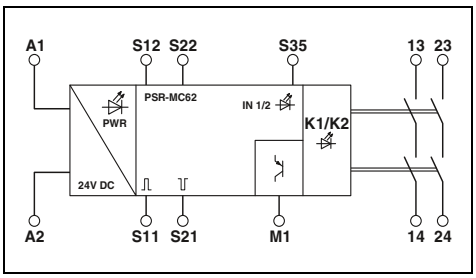
Type IIIA according to EN 574, up to Cat. 1/PL c according to EN ISO 13849-1, SILCL 1 according to IEC EN 62061



new



Type IIIC according to EN 574, up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061



	Technical data	Technical data
Input data		
Rated control supply voltage U_S	24 V DC -20 % / +25 %	24 V DC -20 % / +25 %
Rated control supply current I_S	typ. 35 mA	typ. 40 mA
Typical response time	< 40 ms	< 50 ms
Typical release time	< 10 ms (when controlled via S12/S22) < 5 ms (when interrupted via A1; applicative deactivation via A1/A2 is not permitted)	< 10 ms (when controlled via S12/S22) < 5 ms (when interrupted via A1; applicative deactivation via A1/A2 is not permitted)
Recovery time	< 500 ms	< 500 ms
Output data		
Contact type	2 enabling current paths	2 enabling current paths
Contact material	$AgSnO_2$	$AgSnO_2$
Max./min. switching voltage	250 V AC/DC / 12 V AC/DC	250 V AC/DC / 12 V AC/DC
Limiting continuous current	6 A (observe derating)	6 A (observe derating)
Max./min. inrush current	6 A / 3 mA	6 A / 3 mA
Switching capacity	min. 60 mW	min. 60 mW
Short-circuit protection of the output circuits	6 A gL/gG (N/O contact)	6 A gL/gG (N/O contact)
Alarm outputs		
Number of outputs	1 (digital, PNP)	1 (digital, PNP)
Output current	max. 100 mA	max. 100 mA
Short-circuit protection	Yes	Yes
General data		
Ambient temperature range	-35 °C ... 60 °C (observe derating)	-35 °C ... 60 °C (observe derating)
Air and creepage distances between the circuits	DIN EN 50178	DIN EN 50178
Rated surge voltage/insulation	Basic insulation 4 kV between all current paths and housing Safe isolation, reinforced insulation 6 kV: between (A1, A2, S11, S12, S21, S22, S35, M1) and enabling current path (13/14) between (A1, A2, S11, S12, S21, S22, S35, M1) and enabling current path (23/24) between enabling current paths	Basic insulation 4 kV between all current paths and housing Safe isolation, reinforced insulation 6 kV: between (A1, A2, S11, S12, S21, S22, S35, M1) and enabling current path (13/14) between (A1, A2, S11, S12, S21, S22, S35, M1) and enabling current path (23/24) between enabling current paths
Screw connection solid/stranded/AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid / stranded / AWG	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions Screw version	12.5 mm / 112.2 mm / 114.5 mm	12.5 mm / 112.2 mm / 114.5 mm
W / H / D Spring-cage version	12.5 mm / 116.6 mm / 114.5 mm	12.5 mm / 116.6 mm / 114.5 mm
EMC note	Class A product, see page 525	Class A product, see page 525

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Monitoring of two-hand control devices						
with screw connection	**PSR-MC60-2NO-1DO-24DC-SC**	2700571	1	**PSR-MC62-2NO-1DO-24DC-SC**	2700574	1
with spring-cage connection	**PSR-MC60-2NO-1DO-24DC-SP**	2700572	1	**PSR-MC62-2NO-1DO-24DC-SP**	2700575	1

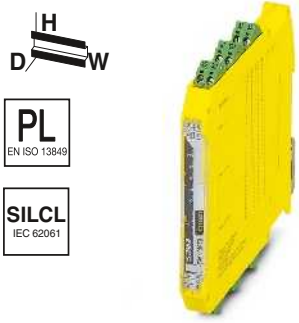
Safety relay modules for machine building – PSRmini

Highly compact safety relays with time function

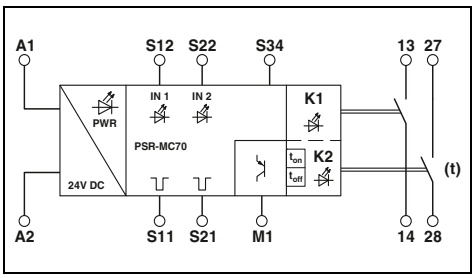
Emergency stop, safety door, and light grid monitoring

- Two-channel control
- 2 enabling current paths, 1 digital signal output
- Release and on delay 0.2 s up to 60 s
- Basic insulation/reinforced insulation in part
- Manual, monitored, and automatic activation in a single device
- Can be retriggered

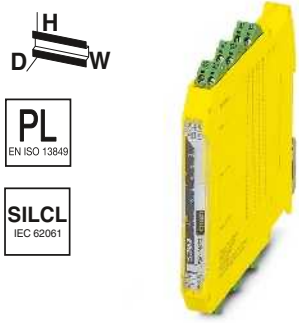
new



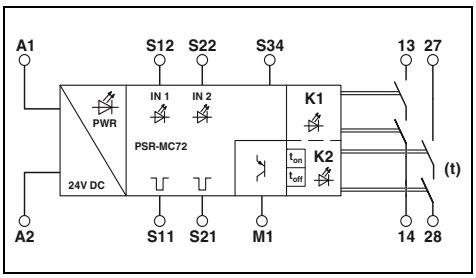
Up to Cat. 1/PL c according to ISO 13849-1, SILCL 1 according to IEC 62061



new



Up to Cat.4/PL e according to ISO 13849-1, SILCL 3 according to IEC 62061



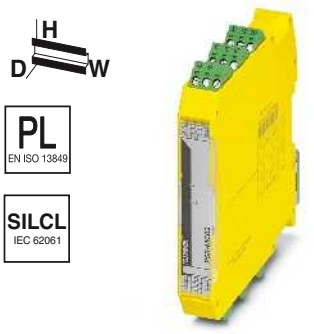
	Technical data	Technical data
Input data		
Rated control supply voltage U_S	24 V DC -20 % / +25 %	24 V DC -20 % / +25 %
Rated control supply current I_S	typ. 50 mA	typ. 60 mA
Typical response time	< 35 ms (automatic start) < 30 ms (manual, monitored start)	< 35 ms (automatic start) < 30 ms (manual, monitored start)
Typical release time	< 20 ms (when controlled via S12 (only for undelayed contact 13/14)) < 5 ms (when interrupted via A1; applicative deactivation via A1/A2 is not permitted)	< 25 ms (when controlled via S12 (only for undelayed contact 13/14)) < 5 ms (when interrupted via A1; applicative deactivation via A1/A2 is not permitted)
Delay time range	0.2 s ... 60 s ±5 % (can be set for 27/28)	0.2 s ... 60 s ±5 % (can be set for 27/28)
Output data		
Contact type	2 enabling current paths	2 enabling current paths
Contact material	$AgSnO_2$	$AgSnO_2$
Max./min. switching voltage	250 V AC/DC / 12 V AC/DC	250 V AC/DC / 12 V AC/DC
Limiting continuous current	6 A (observe derating)	6 A (observe derating)
Max./min. inrush current	6 A / 3 mA	6 A / 3 mA
Switching capacity	min. 60 mW	min. 60 mW
Short-circuit protection of the output circuits	6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)	6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)
Alarm outputs		
Number of outputs	1 (digital, PNP)	1 (digital, PNP)
Output current	max. 100 mA	max. 100 mA
Short-circuit protection	Yes	Yes
General data		
Ambient temperature range	-35 °C ... 60 °C (observe derating)	-35 °C ... 60 °C (observe derating)
Air and creepage distances between the circuits	DIN EN 50178	DIN EN 50178
Rated surge voltage/insulation	Basic insulation 4 kV: between all current paths and housing Safe isolation, reinforced insulation 6 kV: between (A1, A2, S11, S12, S21, S22, S34, M1) and enabling current path (13/14) between (A1, A2, S11, S12, S21, S22, S34, M1) and enabling current path (27/28) between enabling current paths	Basic insulation 4 kV: between all current paths and housing Safe isolation, reinforced insulation 6 kV: between (A1, A2, S11, S12, S21, S22, S34, M1) and enabling current path (13/14) between (A1, A2, S11, S12, S21, S22, S34, M1) and enabling current path (27/28) between enabling current paths
Screw connection solid/stranded/AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid / stranded / AWG	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions Screw version	12.5 mm / 112.2 mm / 114.5 mm	12.5 mm / 112.2 mm / 114.5 mm
W / H / D Spring-cage version	12.5 mm / 116.6 mm / 114.5 mm	12.5 mm / 116.6 mm / 114.5 mm
EMC note	Class A product, see page 525	Class A product, see page 525

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Emergency stop, safety door, and light grid monitoring						
with screw connection	**PSR-MC70-2NO-1DO-24DC-SC**	2702094	1	**PSR-MC72-2NO-1DO-24DC-SC**	2702096	1
with spring-cage connection	**PSR-MC70-2NO-1DO-24DC-SP**	2702095	1	**PSR-MC72-2NO-1DO-24DC-SP**	2702097	1

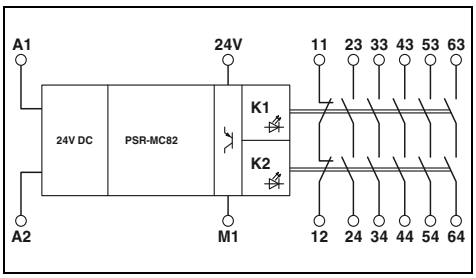
Extension module

new

- 5 enabling current paths, 1 confirmation current path
- Basic insulation/reinforced insulation in part
- In conjunction with a suitable evaluating device: Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061



Contact extension



Technical data

Input data		
Rated control supply voltage U_S		24 V DC -20 % / +25 %
Rated control supply current I_S		typ. 80 mA
Typical response time		< 50 ms
Typical release time		< 25 ms (when controlled via A1/A2)
Recovery time		< 100 ms
Output data		
Contact type		5 enabling current paths 1 confirmation current path
Contact material		$AgSnO_2$
Max./min. switching voltage		250 V AC/DC / 5 V AC/DC
Limiting continuous current		6 A (observe derating)
Max./min. inrush current		6 A / 10 mA
Switching capacity		min. 50 mW
Short-circuit protection of the output circuits		10 A gL/gG (N/O contact) 6 A gL/gG (N/C contact) 6 A gL/gG (N/O contact, for low-demand applications) 4 A gL/gG (N/C contact, for low-demand applications)
Alarm outputs		
Number of outputs		1 (digital, PNP)
Output current		max. 100 mA
Short-circuit protection		Yes
General data		
Ambient temperature range		-20 °C ... 60 °C (observe derating)
Air and creepage distances between the circuits		DIN EN 50178
Rated surge voltage/insulation		Safe isolation, reinforced insulation 6 kV between the input circuit and the enabling current paths. 4 kV basic insulation between enabling current paths Basic insulation 4 kV between all current paths and housing
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid / stranded / AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	17.5 mm / 112.2 mm / 114.5 mm
W / H / D	Spring-cage version	17.5 mm / 116.6 mm / 114.5 mm
EMC note		Class A product, see page 525

Ordering data

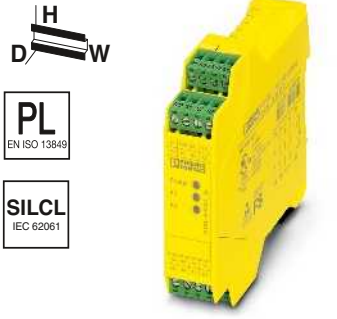
Description	Type	Order No.	Pcs./Pkt.
Extension module			
with screw connection	**PSR-MC82-5NO-1NC-1DO-24DC-SC**	2702382	1
with spring-cage connection	**PSR-MC82-5NO-1NC-1DO-24DC-SP**	2702383	1

Safety relay for emergency stop and safety door monitoring

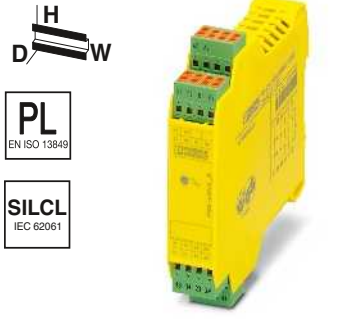
Find out more with the web code

Detailed information on these products can be found on our website. Simply enter # and numbers in the search field.

Your web code: #1409



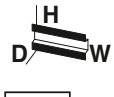
Screw connection



Spring-cage connection

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Emergency stop and safety door monitoring, basic insulation, single-channel control, activation: manual and automatic, 4 enabling and 1 signaling current path, nominal input voltage 24 V AC/DC, Cat. 1/PL c according to EN ISO 13849-1, SILCL 1 according to IEC EN 62061	**PSR-SCP- 24UC/ESA2/4X1/1X2/B**	2963802	1	**PSR-SPP- 24UC/ESA2/4X1/1X2/B**	2963954	1
Emergency stop and safety door monitoring, basic insulation, single-channel control, activation: manual, monitored, and automatic, 3 enabling and 1 signaling current path, nominal input voltage 230 V AC, Cat. 1/PL c according to EN ISO 13849-1, SILCL 1 according to IEC EN 62061	**PSR-SCP-230AC/ESAM2/3X1/1X2/B**	2901430	1	**PSR-SPP-230AC/ESAM2/3X1/1X2/B**	2901431	1
Emergency stop and safety door monitoring, basic insulation, single- and two-channel control, activation: manual, monitored, and automatic, 3 enabling and 1 signaling current path, up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061						
- Nominal input voltage 24 V AC/DC,	**PSR-SCP- 24UC/ESAM4/3X1/1X2/B**	2900509	1	**PSR-SPP- 24UC/ESAM4/3X1/1X2/B**	2900510	1
- Nominal input voltage 42 - 48 V AC/DC	**PSR-SCP-42-48UC/ESAM4/3X1/1X2B**	2901416	1	**PSR-SPP-42-48UC/ESAM4/3X1/1X2B**	2901417	1
- Nominal input voltage 120 V AC/DC	**PSR-SCP-120UC/ESAM4/3X1/1X2/B**	2901422	1	**PSR-SPP-120UC/ESAM4/3X1/1X2/B**	2901425	1
- Nominal input voltage 230 V AC/DC	**PSR-SCP-230UC/ESAM4/3X1/1X2/B**	2901428	1	**PSR-SPP-230UC/ESAM4/3X1/1X2/B**	2901429	1
Emergency stop and safety door monitoring, reinforced insulation, single- and two-channel control, activation: manual, monitored, and automatic, nominal input voltage 24 V AC/DC, up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061						
- 2 enabling and 1 signaling current path	**PSR-SCP- 24UC/ESAM4/2X1/1X2**	2900525	1	**PSR-SPP- 24UC/ESAM4/2X1/1X2**	2900526	1
- 8 enabling and 1 signaling current path	**PSR-SCP- 24UC/ESAM4/8X1/1X2**	2963912	1	**PSR-SPP- 24UC/ESAM4/8X1/1X2**	2963996	1

Safety relay with time functions



PL
EN ISO 13849

SILCL
IEC 62061

Emergency stop, safety door, and light grid monitoring

– Single and two-channel control
– 2 or 3 undelayed and 2 dropout delayed contacts
– Manual, monitored, and automatic activation in a single device
– Nominal input voltage 24 V DC
– Up to Cat. 3/4 and PL d/e according to EN ISO 13849-1, SILCL 3 according to IEC 62061

Find out more with the web code

Detailed information on these products can be found on our website. Simply enter # and numbers in the search field.

Your web code: #1409

	Ordering data		
Description	Type	Order No.	Pcs./Pkt.
Emergency stop, safety door, and light grid monitoring, adjustable release delay time 0.1 s ... 30 s			
with screw connection	**PSR-SCP- 24DC/ESD/4X1/30**	2981800	1
with spring-cage connection	**PSR-SPP- 24DC/ESD/4X1/30**	2981813	1
Emergency stop, safety door, and light grid monitoring, adjustable release delay time 0.2 s ... 300 s			
with screw connection	**PSR-SCP- 24DC/ESD/5X1/1X2/300**	2981428	1
with spring-cage connection	**PSR-SPP- 24DC/ESD/5X1/1X2/300**	2981431	1
Emergency stop, safety door, and light grid monitoring, fixed release delay time 0.5 s			
with screw connection	**PSR-SCP- 24DC/ESD/5X1/1X2/0T 5**	2981101	1
with spring-cage connection	**PSR-SPP- 24DC/ESD/5X1/1X2/0T 5**	2981130	1
Emergency stop, safety door, and light grid monitoring, fixed release delay time 1 s			
with screw connection	**PSR-SCP- 24DC/ESD/5X1/1X2/ T 1**	2981143	1
with spring-cage connection	**PSR-SPP- 24DC/ESD/5X1/1X2/ T 1**	2981156	1
Emergency stop, safety door, and light grid monitoring, fixed release delay time 3 s			
with screw connection	**PSR-SCP- 24DC/ESD/5X1/1X2/ T 3**	2981224	1
with spring-cage connection	**PSR-SPP- 24DC/ESD/5X1/1X2/ T 3**	2981237	1
Emergency stop, safety door, and light grid monitoring, fixed release delay time 5 s			
with screw connection	**PSR-SCP- 24DC/ESD/5X1/1X2/ T 5**	2981266	1
with spring-cage connection	**PSR-SPP- 24DC/ESD/5X1/1X2/ T 5**	2981279	1

Safety relay for emergency stop, safety door, and light grid monitoring

– Single and two-channel control
– 2 or 3 enabling current paths, 1 signaling current path or digital signal output
– Manual, monitored, and automatic activation in a single device
– Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061

Safety relay for two-hand control devices

– For two-hand control devices as per EN 574 type IIIC
– Two-channel control
– 2 enabling current paths, 1 signaling current path
– Automatic activation
– Concurrence monitoring < 0.5 s
– Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061

Find out more with the web code

Detailed information on these products can be found on our website. Simply enter # and numbers in the search field.

Your web code: #1409

Notes:

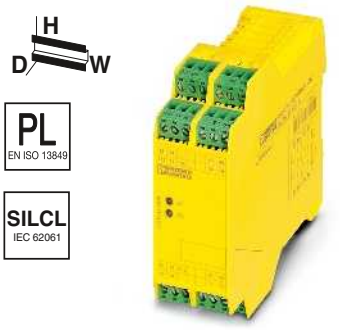
Moreover, the PSR-SDC4 is also suitable for light grid monitoring, see page 265

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Optical data link emergency stop and safety door monitoring, one and two-channel, activation: manually monitored and automatic			
with screw connection	**PSR-SCP- 24UC/ESL4/3X1/1X2/B**	**2981059**	1
with spring-cage connection	**PSR-SPP- 24UC/ESL4/3X1/1X2/B**	**2981062**	1
Master module for emergency stop, safety door, light grid, and magnetic switch			
with screw connection	**PSR-SCP- 24DC/SDC4/2X1/B**	**2981486**	1
with spring-cage connection	**PSR-SPP- 24DC/SDC4/2X1/B**	**2981499**	1
Two-hand control units and safety door monitoring, two-channel, with cross-circuiting detection, activation: automatic			
with screw connection	**PSR-SCP- 24UC/THC4/2X1/1X2**	**2963721**	1
with spring-cage connection	**PSR-SPP- 24UC/THC4/2X1/1X2**	**2963983**	1

Extension modules

– Single and two-channel control
– 5 enabling, 1 signaling, and 1 confirmation current path
– Option of basic insulation or reinforced insulation
– Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061



Contact extension

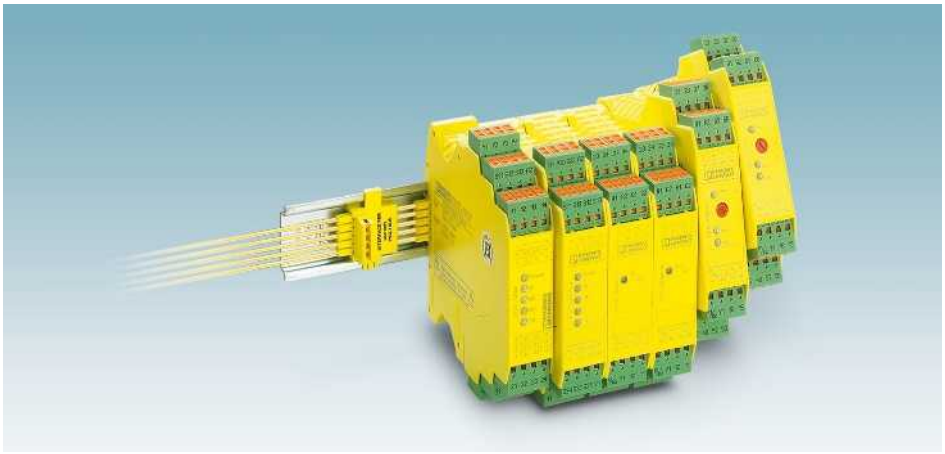
Find out more with the web code

Detailed information on these products can be found on our website. Simply enter # and numbers in the search field.

Your web code: #1409

Description	Type	Order No.	Pcs./Pkt.
		Ordering data	
Extension module, reinforced insulation, single- or two-channel control, 5 enabling, 1 signaling, and 1 confirmation current path			
with screw connection	**PSR-SCP- 24UC/URM4/5X1/2X2**	2963734	1
with spring-cage connection	**PSR-SPP- 24UC/URM4/5X1/2X2**	2964005	1
Extension module, basic insulation, single-channel control, 5 enabling, 1 signaling, and 1 confirmation current path			
with screw connection	**PSR-SCP- 24UC/URM4/5X1/2X2/B**	2981033	1
with spring-cage connection	**PSR-SPP- 24UC/URM4/5X1/2X2/B**	2981046	1
Extension module, basic insulation, for electro-sensitive protective equipment such as light grids, single- or two-channel control, 3 enabling and 1 signaling current path			
with screw connection	**PSR-SCP-24DC/URML4/3X1/1X2/B**	2903583	1
with spring-cage connection	**PSR-SPP-24DC/URML4/3X1/1X2/B**	2903584	1
Extension module, basic insulation, with wide-range input (42 ... 230 V AC/DC), single- or two-channel control, 4 enabling, 1 signaling, and 1 confirmation current path			
with screw connection	**PSR-SCP-42-230UC/URM4/4NO/2NC**	2702924	1
with spring-cage connection	**PSR-SPP-42-230UC/URM4/4NO/2NC**	2702925	1

Modular safety relay system



The PSR safety relay system reduces planning effort, simplifies wiring, and minimizes storage costs.

The PSR-SDC4 multifunctional master (can also be used as a stand-alone component) monitors the various safety-related signals - without the need for programming or additional switch settings. The relevant safety equipment (emergency stop buttons, safety door/solenoid switches, and light grids) is simply connected to the module.

If required, the PSR-URM4/B and PSR-URD3 extension devices can be used to integrate additional undelayed and dropout delayed contacts via the PSR-TBUS DIN rail connector.

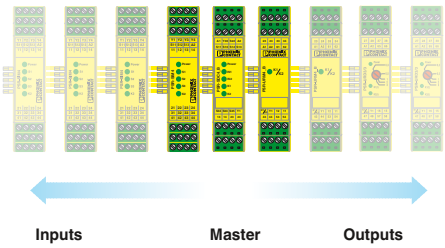
The PSR-SIM4 interface module and PSR-SACB sensor box are suitable for wiring several safety switches with N/C or N/O contacts (e.g., in the case of multiple safety doors or safety flaps). The individual switches are automatically linked to one another and connected to the PSR-SDC4 master.

Additional signal outputs enable precise diagnostics.

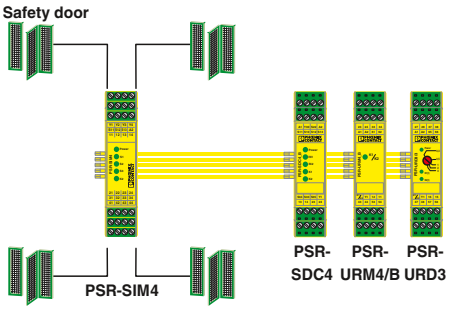
Find out more with the web code

Detailed information on these products can be found on our website. Simply enter # and numbers in the search field.

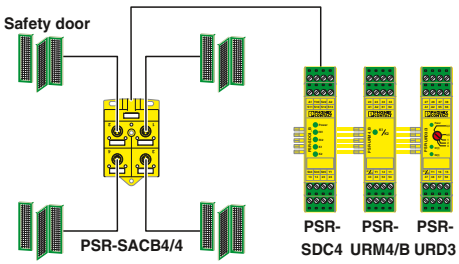
#1408



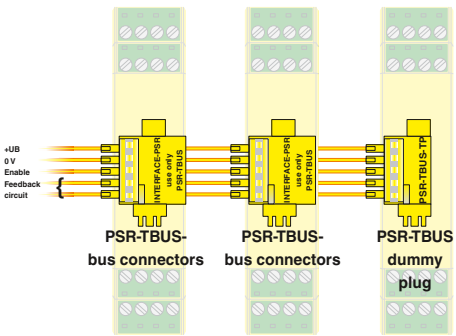
Additional inputs are aligned on the left of the PSR-SDC4, outputs are to its right.



Up to 4 safety door switches can be connected to one PSR-SIM4.



Signals of up to 4 safety door switches can be switched together directly in the field.



PSR-TBUS DIN rail connectors are used for cross-wiring between the modules.

Modular safety relay system

- Single and two-channel control of the master
- Manual, monitored, and automatic activation in a single device
- With or without cross circuit detection
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061
- Extension modules with adjustable release time: up to Cat. 3/PL d according to EN ISO 13849-1, SILCL 2 according to IEC EN 62061

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Master module for emergency stop, safety door, light grid, and magnetic switch			
with screw connection	**PSR-SCP- 24DC/SDC4/2X1/B**	2981486	1
with spring-cage connection	**PSR-SPP- 24DC/SDC4/2X1/B**	2981499	1
Extension module, with one-channel control			
with screw connection	**PSR-SCP- 24DC/URM4/4X1/2X2/B**	2981677	1
with spring-cage connection	**PSR-SPP- 24DC/URM4/4X1/2X2/B**	2981680	1
Extension module with dropout delayed contacts (adjustable up to max. 3 s), single-channel control			
with screw connection	**PSR-SCP- 24DC/URD3/4X1/2X2/3**	2981732	1
with spring-cage connection	**PSR-SPP- 24DC/URD3/4X1/2X2/3**	2981745	1
Extension module with dropout delayed contacts (adjustable up to max. 30 s), single-channel control			
with screw connection	**PSR-SCP- 24DC/URD3/4X1/2X2**	2981512	1
with spring-cage connection	**PSR-SPP- 24DC/URD3/4X1/2X2**	2981525	1
Interface module, for up to four safety sensors/switches with N/O or N/C contacts			
with screw connection	**PSR-SCP- 24DC/SIM4**	2981936	1
with spring-cage connection	**PSR-SPP- 24DC/SIM4**	2981949	1
Sensor box, with M12 slots and connected master cable, for magnetic limit switch with N/C contacts / N/O contacts, LEDs for signaling			
Length of cable: 5 m	**PSR-SACB-4/4-L- 5,0PUR-SD**	2981871	1
Length of cable: 10 m	**PSR-SACB-4/4-L-10,0PUR-SD**	2981884	1

Accessories

PSR-TBUS DIN rail connector, for supplying/controlling/monitoring (depending on the module)	**PSR-TBUS**	2890425	50
PSR TBUS dummy plug	**PSR-TBUS-TP**	2981716	50

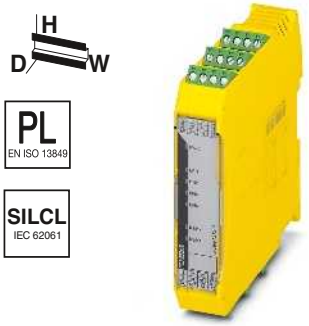
Multifunctional safety relays

You can easily implement three safety functions, such as emergency stop, safety door or light grid monitoring, with the PSR-MXF device range – and all using a single device.

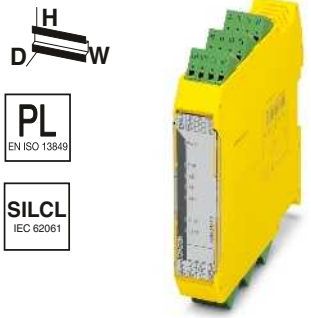
In total, there are four function versions available each with three connection methods.

Features:

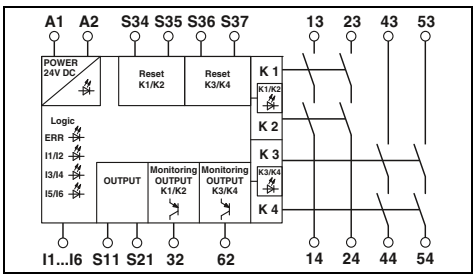
- Single and two-channel control
- 2 x 2 enabling current paths, 2 digital signal outputs
- Basic insulation
- Manual, monitored, and automatic activation in a single device
- No software configuration required
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IC EN 62061

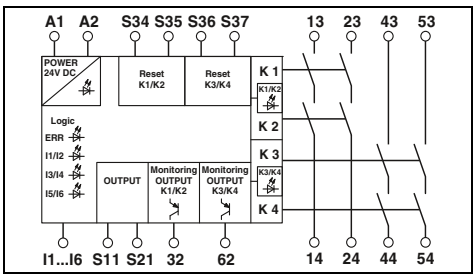


Screw connection



Spring-cage connection





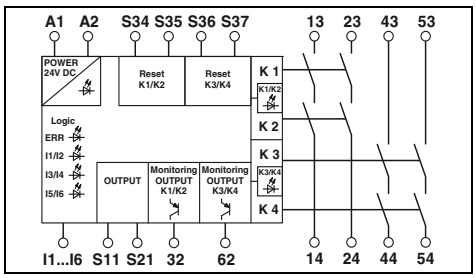
	Technical data	Technical data
Input data		
Nominal input voltage U_N	24 V DC	24 V DC
Permissible range (with reference to U_N)	0.85 ... 1.1	0.85 ... 1.1
Typ. current consumption (with reference to U_N)	125 mA (with actuated relays) / 55 mA (Two-channel 24 V/0 V + max. 200 mA control (message outputs 32/62) with non-actuated relays)	125 mA (with actuated relays) / 55 mA (Two-channel 24 V/0 V + max. 200 mA control (message outputs 32/62) with non-actuated relays)
Recovery time	1 s (Availability time after activation of sensor circuit: 100ms)	1 s (Availability time after activation of sensor circuit: 100ms)
Output data		
Contact type	4 enabling current paths 2 semiconductor alarm outputs	4 enabling current paths 2 semiconductor alarm outputs
Contact material	AgCuNi, +0,2 -0,4 µm Au	AgCuNi, +0,2 -0,4 µm Au
Max./min. switching voltage	250 V AC/DC / 10 V AC/DC	250 V AC/DC / 10 V AC/DC
Limiting continuous current	6 A (N/O contact) , max. 100 mA (Alarm output (24 V DC))	6 A (N/O contact) , max. 100 mA (Alarm output (24 V DC))
Max./min. inrush current	6 A / 10 mA	6 A / 10 mA
Switching capacity (360/h cycles)	5 A (0.1 Hz; DC13; 24 V)	5 A (0.1 Hz; DC13; 24 V)
Switching capacity (3600/h cycles)	3 A (AC15; 230 V)	3 A (AC15; 230 V)
Short-circuit protection of the output circuits	6 A gL/gG NEOZED (N/O contact) 4 A gL/gG NEOZED (for low-demand applications)	6 A gL/gG NEOZED (N/O contact) 4 A gL/gG NEOZED (for low-demand applications)
General data		
Ambient temperature range	-20 °C ... 45 °C (see derating curve)	-20 °C ... 45 °C (see derating curve)
Air and creepage distances between the circuits	DIN EN 50178/VDE 0160	DIN EN 50178/VDE 0160
Rated surge voltage/insulation	4 kV/basic isolation (safe isolation, reinforced insulation and 6 kV between input circuit, enabling current paths and safety circuit 1 (13/14, 23/24) and safety circuit 2 (43/44, 53/54).)	4 kV/basic isolation (safe isolation, reinforced insulation and 6 kV between input circuit, enabling current paths and safety circuit 1 (13/14, 23/24) and safety circuit 2 (43/44, 53/54).)
Dimensions W / H / D	22.5 mm / 112.2 mm / 114.5 mm	22.5 mm / 117.4 mm / 114.5 mm
EMC note	Class A product, see page 525	Class A product, see page 525

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Multi-functional safety relay, three safety functions, one and two-channel, two local shutdown levels						
- Emergency stop and safety door monitoring	**PSR-SCP- 24DC/MXF1/4X1/2X2/B**	2902725	1	**PSR-SPP-24DC/MXF1/4X1/2X2/B**	2902726	1
- Emergency stop and magnetic switch monitoring	**PSR-SCP-24DC/MXF2/4X1/2X2/B**	2903254	1	**PSR-SPP-24DC/MXF2/4X1/2X2/B**	2903255	1
- Emergency stop, safety door, and light grid monitoring	**PSR-SCP-24DC/MXF3/4X1/2X2/B**	2903257	1	**PSR-SPP-24DC/MXF3/4X1/2X2/B**	2903258	1
- Emergency stop, magnetic switch, and light grid monitoring	**PSR-SCP-24DC/MXF4/4X1/2X2/B**	2903260	1	**PSR-SPP-24DC/MXF4/4X1/2X2/B**	2903261	1

PL
EN ISO 13849

SILCL
IEC 62061

Push-in connection



Technical data

24 V DC
0.85 ... 1.1
125 mA (with actuated relays) /
55 mA (Two-channel 24 V/0 V + max. 200 mA control (message outputs 32/62) with non-actuated relays)

1 s (Availability time after activation of sensor circuit: 100ms)

4 enabling current paths
2 semiconductor alarm outputs
AgCuNi, +0,2 -0,4 µm Au
250 V AC/DC / 10 V AC/DC
6 A (N/O contact) , max. 100 mA (Alarm output (24 V DC))

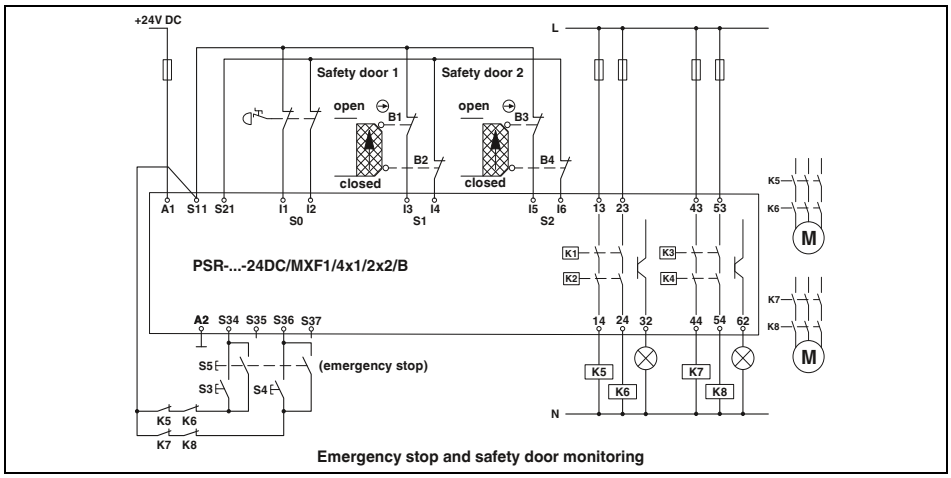
6 A / 10 mA
5 A (0.1 Hz; DC13; 24 V)
3 A (AC15; 230 V)
6 A gL/gG NEOZED (N/O contact)
4 A gL/gG NEOZED (for low-demand applications)

-20 °C ... 45 °C (see derating curve)
DIN EN 50178/VDE 0160
4 kV/basic isolation (safe isolation, reinforced insulation and
6 kV between input circuit, enabling current paths and
safety circuit 1 (13/14, 23/24) and safety circuit 2 (43/44, 53/54).)

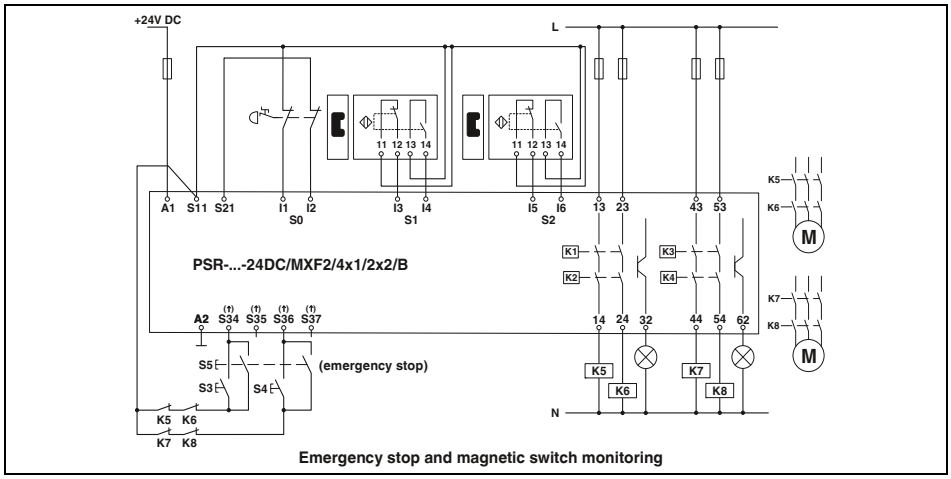
22.5 mm / 106.4 mm / 114.5 mm
Class A product, see page 525

Ordering data

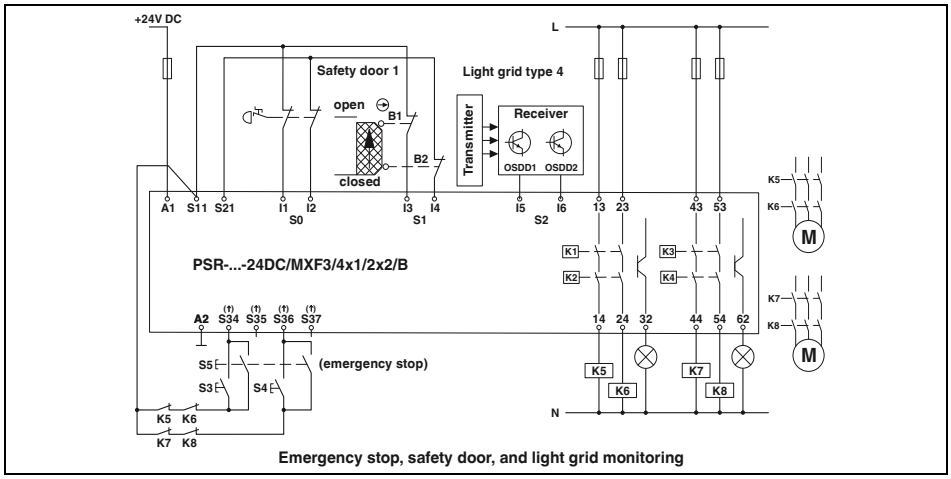
Type	Order No.	Pcs./Pkt.
PSR-PIP-24DC/MXF1/4X1/2X2/B	2903253	1
PSR-PIP-24DC/MXF2/4X1/2X2/B	2903256	1
PSR-PIP-24DC/MXF3/4X1/2X2/B	2903259	1
PSR-PIP-24DC/MXF4/4X1/2X2/B	2903262	1



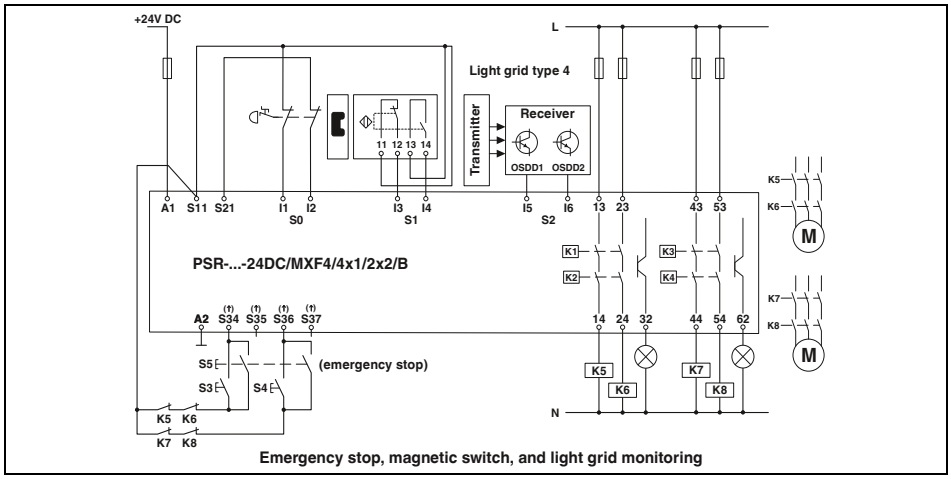
Emergency stop and safety door monitoring



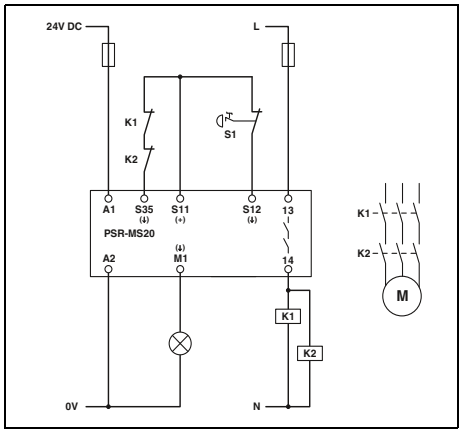
Emergency stop and magnetic switch monitoring



Emergency stop, safety door, and light grid monitoring

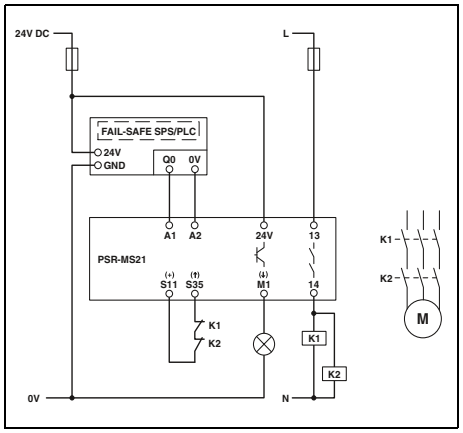


Emergency stop, magnetic switch, and light grid monitoring



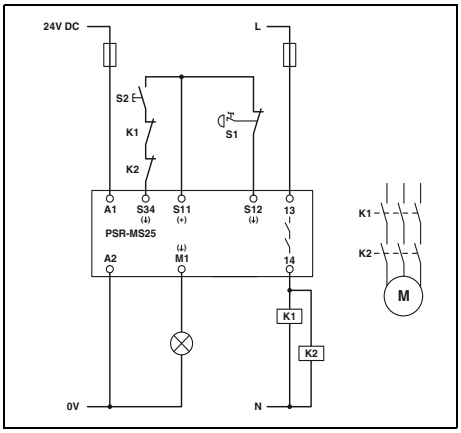
PSR-MS20

– Single-channel emergency stop monitoring with automatic start



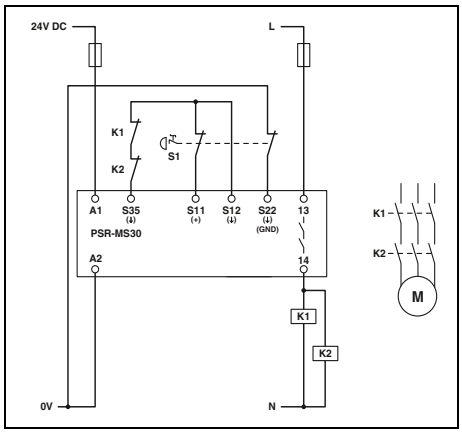
PSR-MS21

– Single-channel control via failsafe PLC



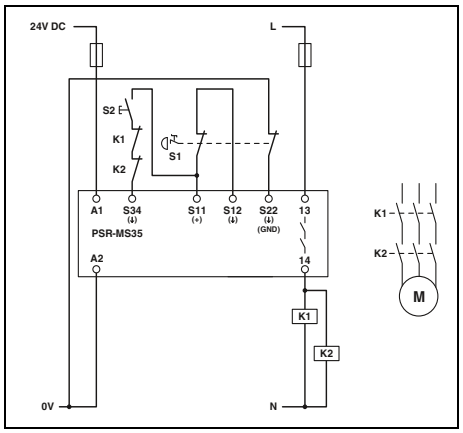
PSR-MS25

– Single-channel emergency stop monitoring with manual, monitored start



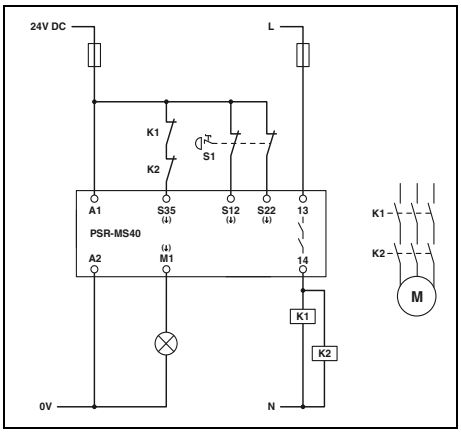
PSR-MS30

– Two-channel emergency stop monitoring with automatic start



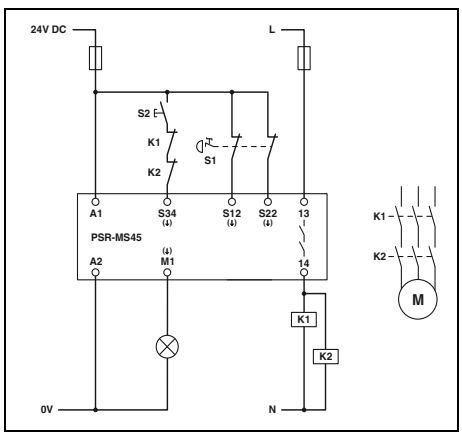
PSR-MS35

– Two-channel emergency stop monitoring with manual, monitored start



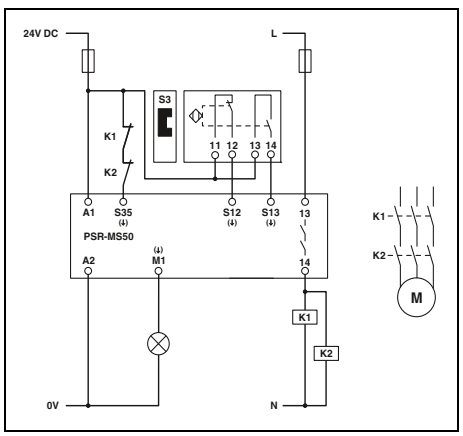
PSR-MS40

– Two-channel emergency stop monitoring with automatic start (no cross-circuit detection in the sensor circuit)



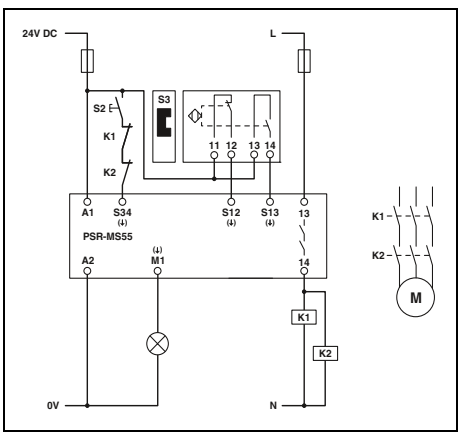
PSR-MS45

– Two-channel emergency stop monitoring with automatic start (no cross-circuit detection in the sensor circuit)



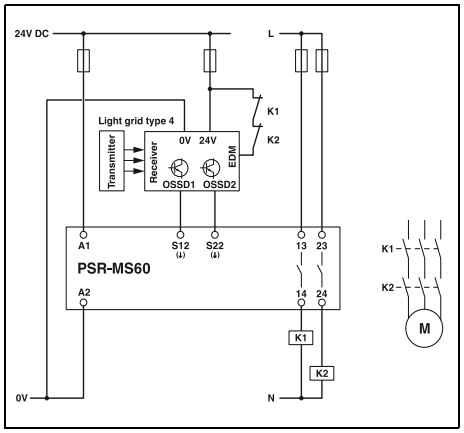
PSR-MS50

– Two-channel, non-equivalent magnetic switch monitoring with automatic start



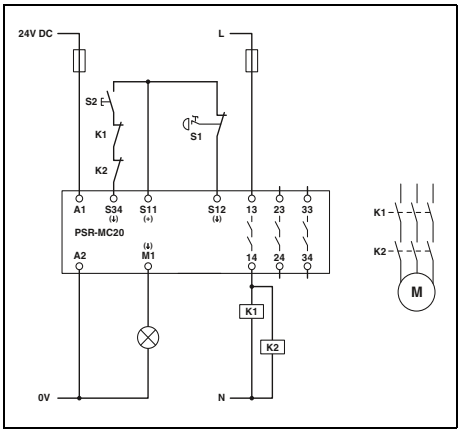
PSR-MS55

– Two-channel, non-equivalent magnetic switch monitoring with manual, monitored start



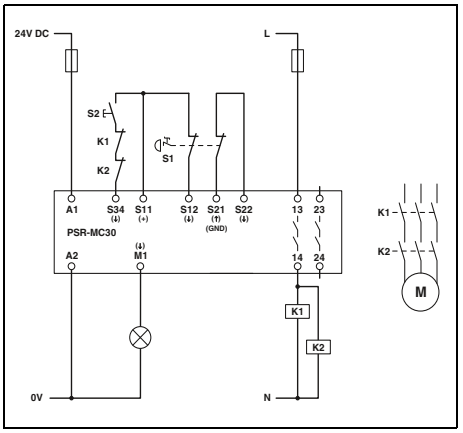
PSR-MS60

– Two-channel light grid monitoring with automatic start



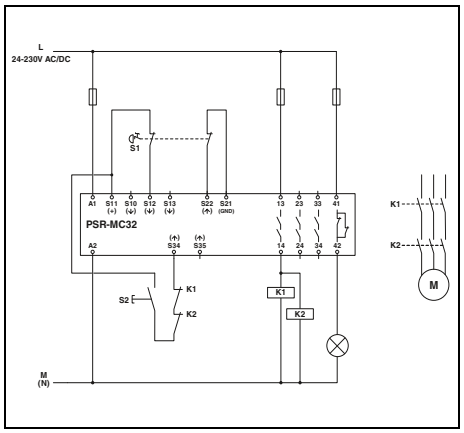
PSR-MC20

– Single-channel emergency stop monitoring with manual, monitored start



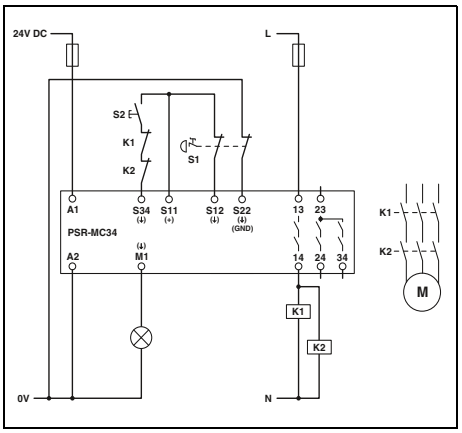
PSR-MC30

– Two-channel emergency stop monitoring with manual, monitored start; cross-circuit detection



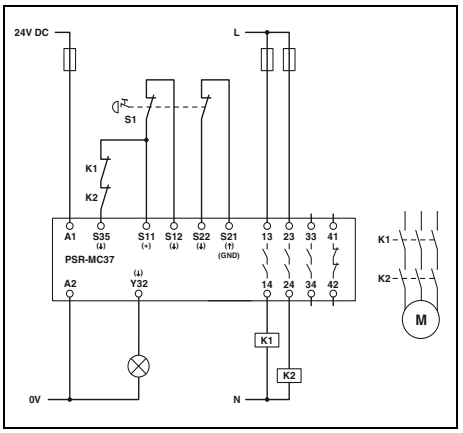
PSR-MC32

– Two-channel emergency stop monitoring with manual, monitored start



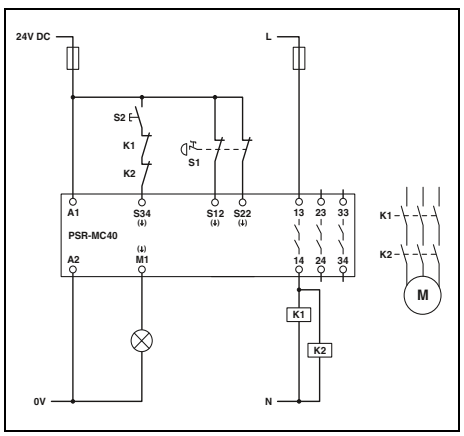
PSR-MC34

– Two-channel emergency stop monitoring with manual, monitored start; cross-circuit detection



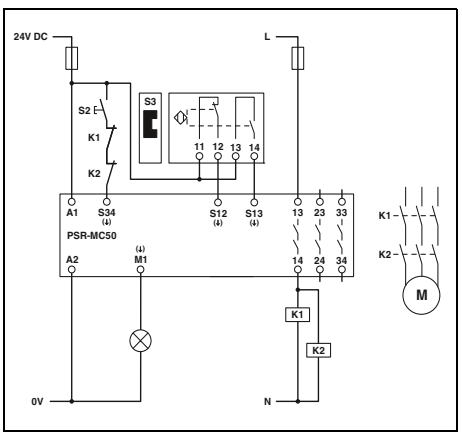
PSR-MC37

– Two-channel emergency stop monitoring with automatic start



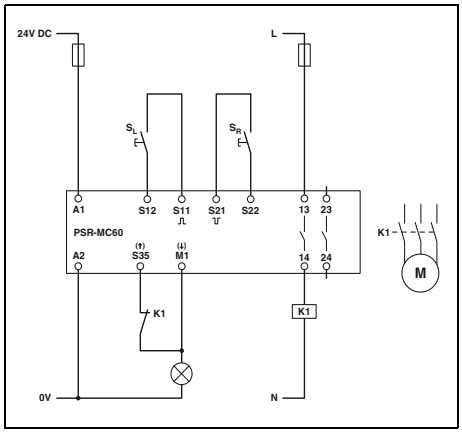
PSR-MC40

– Two-channel emergency stop monitoring with manual, monitored start (no cross-circuit detection in the sensor circuit)

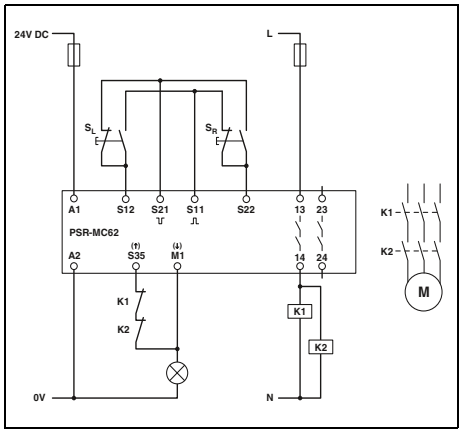


PSR-MC50

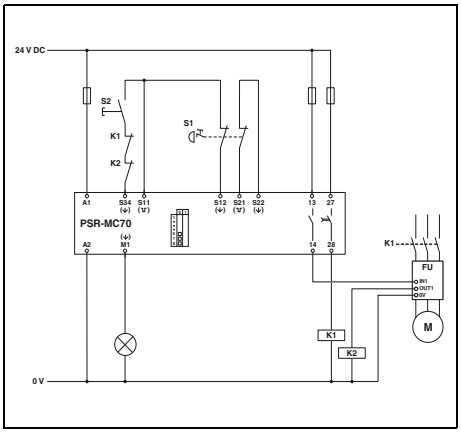
– Two-channel, non-equivalent magnetic switch monitoring with manual, monitored start



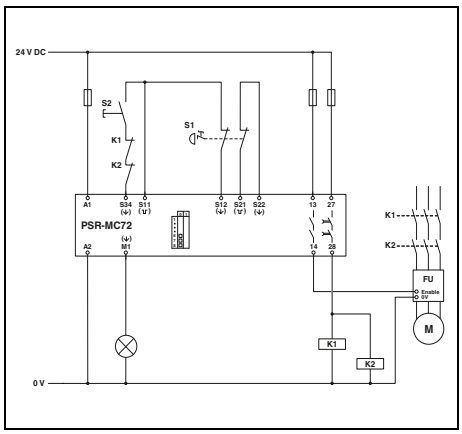
PSR-MC60
– Two-hand monitoring type IIIA



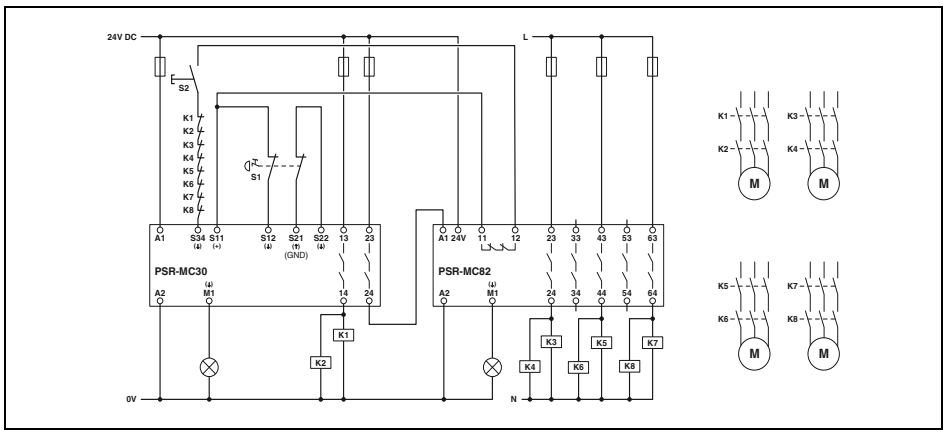
PSR-MC62
– Two-hand monitoring type IIIC



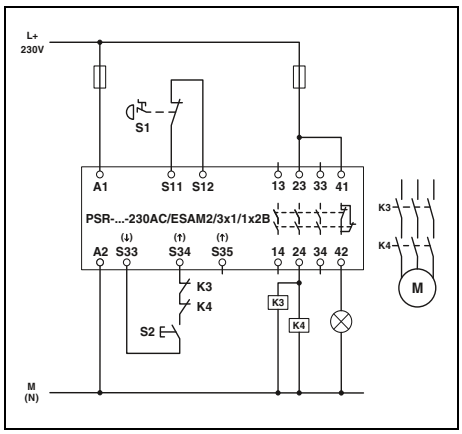
PSR-MC70
– Single-channel emergency stop monitoring with manual, monitored start



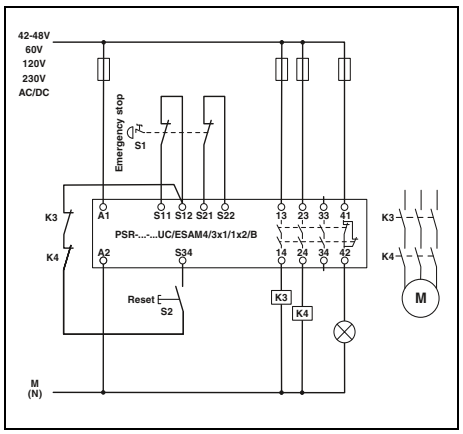
PSR-MC72
– Two-channel emergency stop monitoring with manual, monitored start



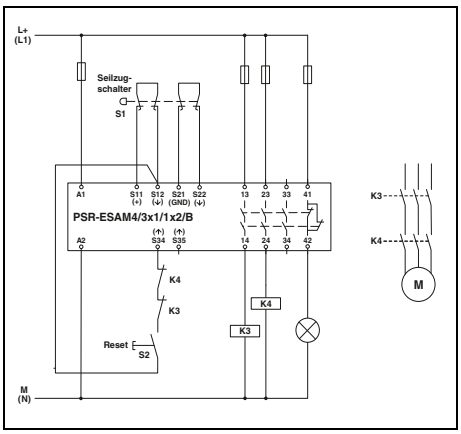
PSR-MC82
– Two-channel emergency stop monitoring with contact extension



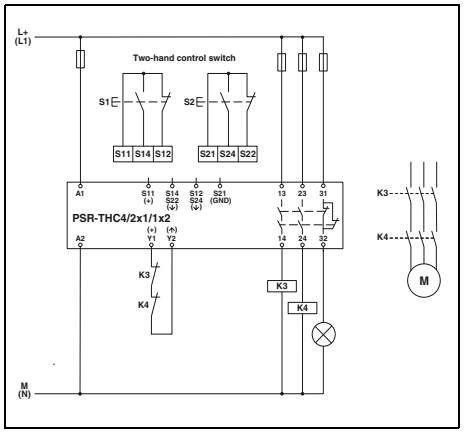
PSR-ESAM2/3X1-B
– Single-channel emergency stop monitoring with manual, monitored start
– Automatic activation: bridge at S33/S35



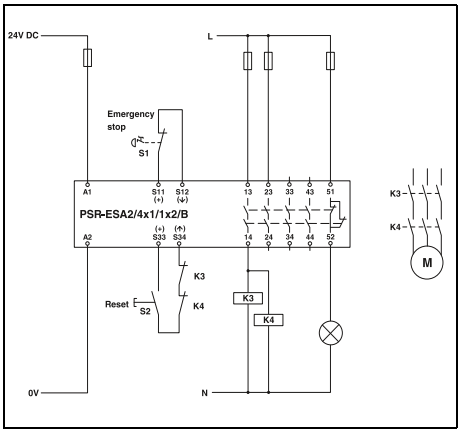
PSR-ESAM4/3X1-B
– Two-channel emergency stop monitoring with manual, monitored start; cross-circuit detection
– Automatic activation: bridge at S22/S34



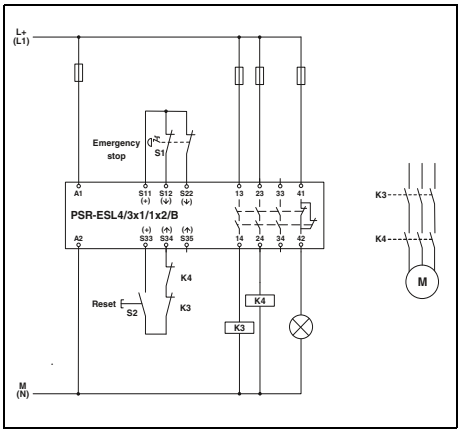
PSR-ESAM4/3X1-B
– Two-channel monitoring of a cable-operated switch with manual, monitored start; cross-circuit detection
– Automatic activation: bridge at S12/S35



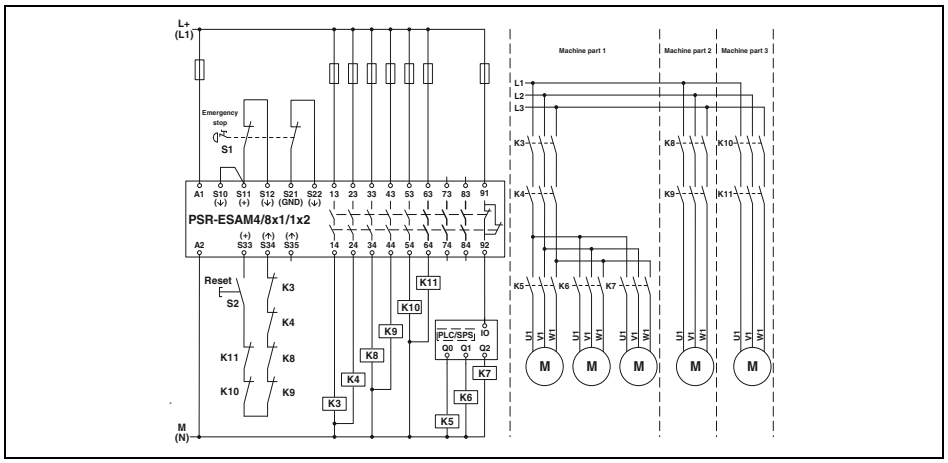
PSR-THC4
– Two-hand monitoring type IIIC



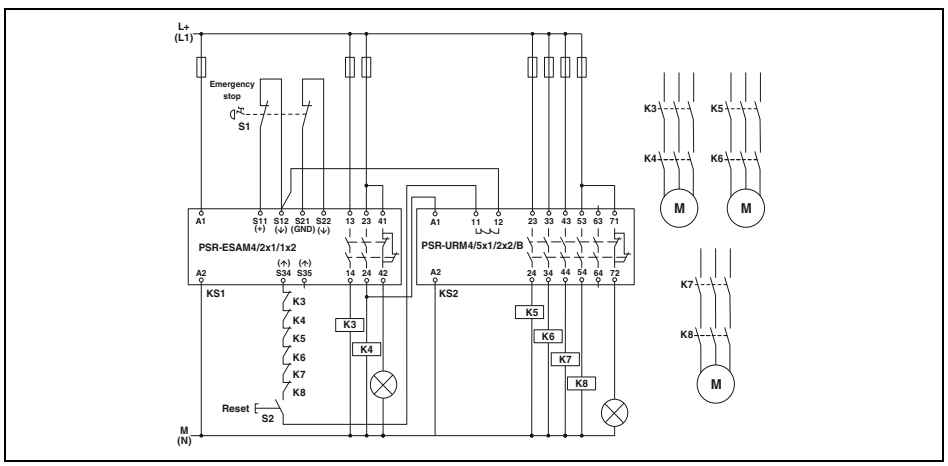
PSR-ESA2-B
– Single-channel emergency stop monitoring with manual start
– Automatic activation: bridge at S33/S34



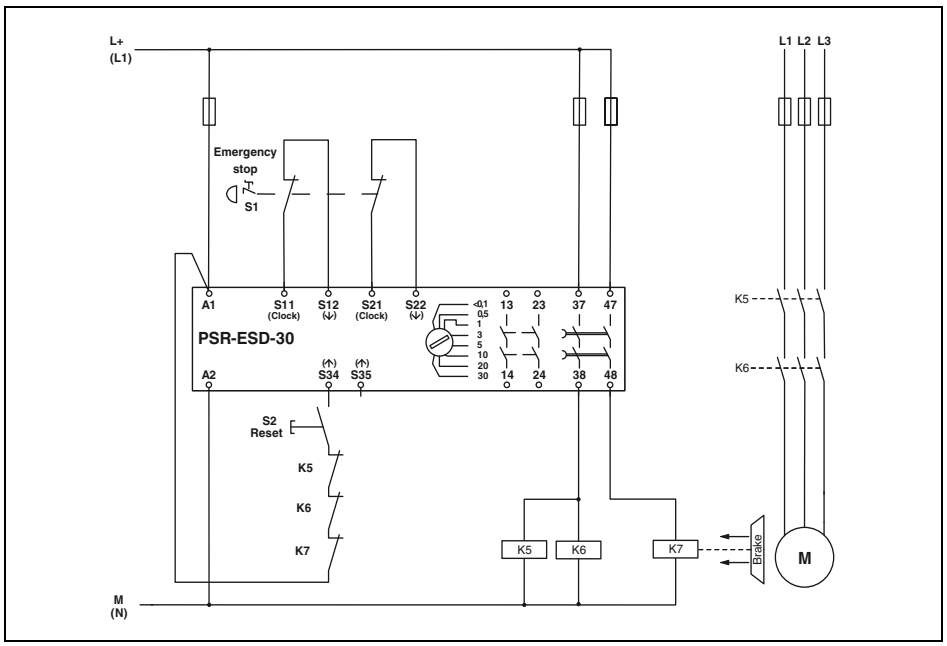
PSR-ESL4
– Two-channel emergency stop monitoring with manual, monitored start; cross-circuit detection
– Automatic activation: bridge at S33/S35



PSR-ESAM4/8X1
– Two-channel emergency stop monitoring with manual, monitored start; cross-circuit detection
– Automatic activation: bridge at S33/S35



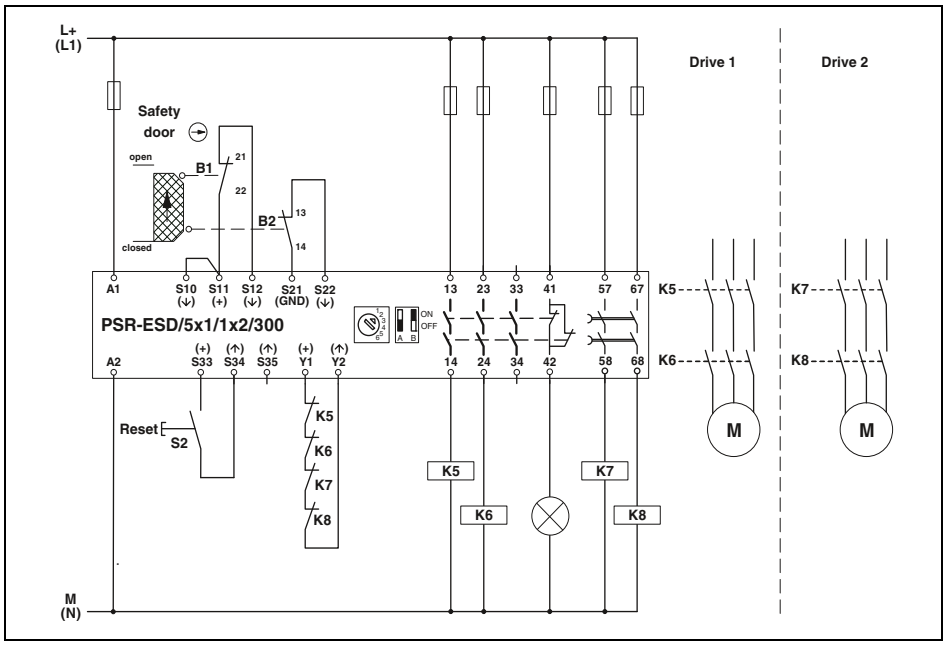
PSR-URM4 and PSR-URM4-B
– Two-channel emergency stop monitoring with manual, monitored start
– Linking with PSR-ESAM4/2X1
– Integration of the confirmation current path in the basic device



PSR-ESD-30

– Two-channel emergency stop monitoring with manual, monitored start; cross-circuit detection

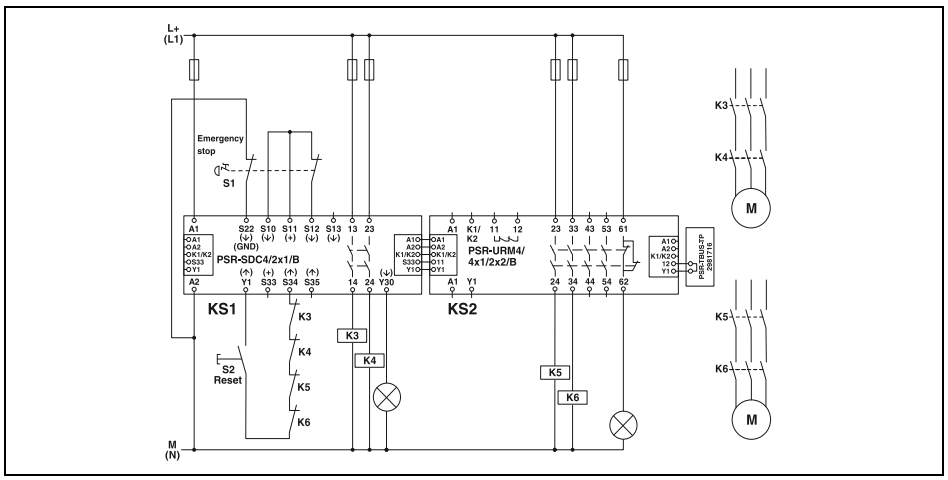
– Automatic activation: bridge at A1/S35



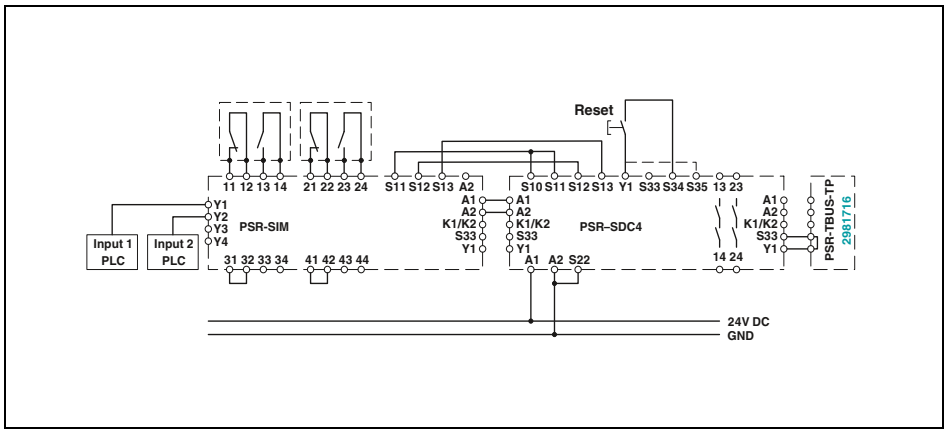
PSR-ESD-300

– Two-channel safety door monitoring with manual, monitored start; cross-circuit detection

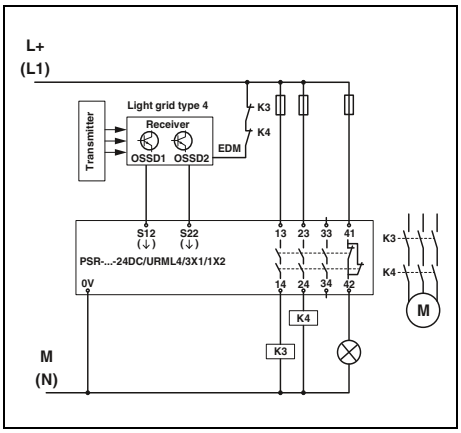
– Automatic activation: bridge at S33/S35



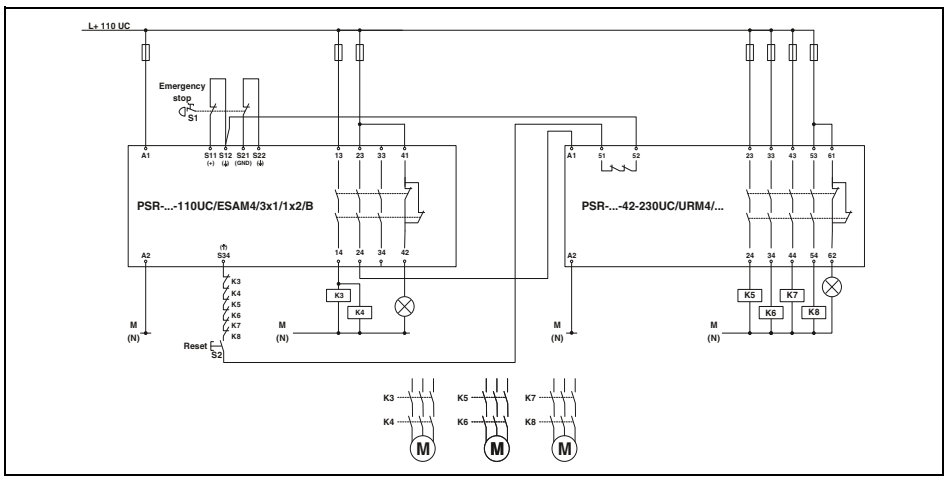
PSR-SDC4 with PSR-URM4-B
– Two-channel emergency stop monitoring with manual, monitored start
– Contact extension via PSR-TBUS
– Automatic activation: bridge at S33/S35



PSR-SIM4 with PSR-SDC4
– Safety door monitoring with manual, monitored start
– Contact extension via interface module
– Automatic activation: bridge at S33/S35



PSR-URML4
– Two-channel light grid monitoring
– Cross-circuit detection via light grid



PSR-URM4/42-230UC and PSR-ESAM4/3X1-B
– Two-channel emergency stop monitoring with manual, monitored start
– Linking with PSR-ESAM4/3X1-B
– Integration of the confirmation current path in the basic device

Zero-speed and over-speed safety relays

The PSRmotion safety relay modules reliably monitor the speed and downtime of rotating parts in machines and systems. As such, they can be flexibly integrated, independently from the selected drive structure, into the machine's safety concept.

Sensor-free monitoring

The narrow **PSR-MM25** zero-speed safety relay does not require any additional sensors for monitoring. The residual voltage induced by the motor windings is analyzed in order to detect downtime.

If the induced voltage drops below the adjustable switching threshold on the PSR-MM25 while the motor is running down or is at zero speed, the safe outputs are enabled. With the enable signal, you can control guard controls on interlocking devices, for example.

Connection of encoders or proximity switches

With the **PSR-RSM4** combined zero-speed and over-speed safety relay, you can monitor up to three different speeds in operation as well as downtime.

A potential application is working on a machine or system with an open safety door. In such cases, the movements of the drives must be monitored for safe stop or safe reduced speed, for example. If the speed of a drive exceeds the permissible maximum value, the system is shut down safely.

For movement detection, sensors such as HTL, TTL or sine/cosine encoders as well as proximity switches can be used. Pre-assembled cable adapters are available for connection to the motor feedback of available drives.

PSR-MM25 – sensor-free zero-speed monitoring of motors for controlling guard locks

PSR-RSM4 – easy parameterization of speed monitoring via software

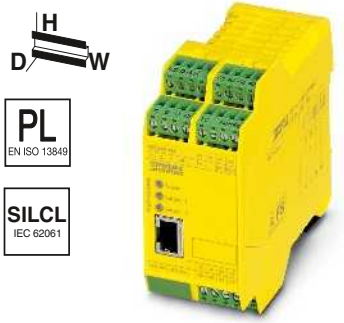
Zero-speed and over-speed safety relays

- Monitors up to three different speeds plus downtime
- Option to connect encoders (TTL, HTL, SIN/COS) and proximity switches
- Can be parameterized using free PSR-CONF-WIN configuration software
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061

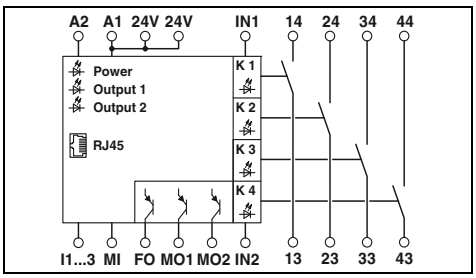
Notes:

Pre-assembled cable adapters are available for connecting the PSR-RSM4 zero-speed and over-speed safety relay to the motor feedback system (of the controller) - Order No. on request.

The necessary PSR-CONF-WIN configuration software can be downloaded free of charge from phoenixcontact.com.



Can be parameterized via software



Technical data

Input data		
Nominal input voltage U_N		24 V DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		100 mA
Typical response time		15 ms
Typical release time		12 ms
Recovery time		1 s
Output data		
Contact type		4 enabling current paths
Contact material		AgNi10, + 5 µm Au
Max./min. switching voltage		250 V AC/DC / 100 mV AC/DC
Limiting continuous current		5 A , 100 mA (alarm outputs)
Max./min. inrush current		6 A / 1 mA
Min. switching power		1 mW
Switching capacity (3600/h cycles)		2 A (24 V (DC13)) ; 3 A (230 V (AC15))
Short-circuit protection of the output circuits		6 A gL
General data		
Ambient temperature range		-20 °C ... 55 °C
Air and creepage distances between the circuits		EN 60664/VDE 0110
Rated surge voltage/insulation		4 kV / Basic isolation, (safe isolation, reinforced insulation and 6 kV between input circuit and enabling current paths.)
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid / stranded / AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	45 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	45 mm / 112 mm / 114.5 mm
EMC note		Class A product, see page 525

Ordering data

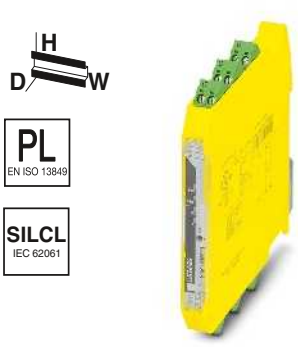
Description	Type	Order No.	Pcs./Pkt.
Zero-speed and over-speed safety relay, 2-channel, automatic control with cable adapter or two initiators, activation: manual and automatic			
with screw connection	**PSR-SCP- 24DC/RSM4/4X1**	2981538	1
with spring-cage connection	**PSR-SPP- 24DC/RSM4/4X1**	2981541	1

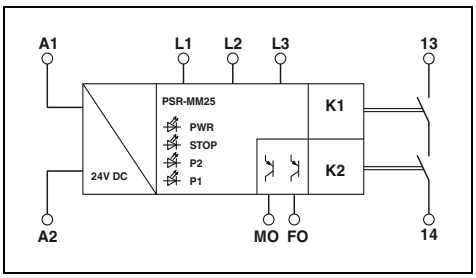
Accessories

Cable adapter for PSR-RSM4, cable length 2.5 m, for control unit:			
Lenze	**CABLE- 9/8/250/RSM/LENZE**	2981826	1
Siemens Heidenhain, 15/8-pos.	**CABLE-15/8/250/RSM/SIMO611D**	2981606	1
Siemens Heidenhain, 25/8-pos.	**CABLE-25/8/250/RSM/SIMO611D**	2981583	1
Further types on request			
Configuration software for parameterizing the PSR-RSM4 safe zero-speed and over-speed safety relay, with programming cable	**PSR-CONF-WIN1.0**	2981554	1

Downtime monitoring

- Sensor-free downtime monitoring of 1- and 3-phase alternating current and direct current motors
- Two-channel evaluation of the residual voltage induced in the motor windings
- Switching threshold: 50 mV … 500 mV, adjustable
- Time delay: 0.5 s … 20 s, adjustable
- 1 enabling current path, 2 digital signal outputs
- Up to Cat. 3/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061





Technical data

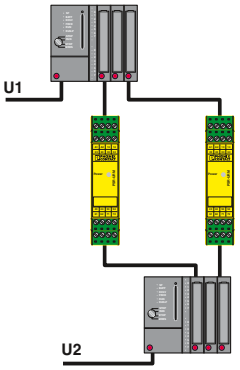
Input data		
Rated control supply voltage U_S		24 V DC -15 % / +10 %
Rated control supply current I_S		typ. 50 mA
Typ. starting time with U_s		< 1 s
Output data		
Contact type		1 enabling current path
Contact material		$AgSnO_2$
Max./min. switching voltage		250 V AC/DC / 24 V AC/DC
Limiting continuous current		5 A (observe derating)
Max./min. inrush current		5 A / 3 mA
Switching capacity		min. 72 mW
Short-circuit protection of the output circuits		5 A gL/gG (N/O contact)
General data		
Ambient temperature range		-20 °C ... 55 °C (observe derating)
Air and creepage distances between the circuits		DIN EN 50178
Rated surge voltage/insulation		Basic insulation 4 kV: between all current paths and housing Safe isolation, reinforced insulation 6 kV: between A1/A2 and 13/14 between MO/FO and 13/14 Safe isolation, reinforced insulation 8 kV: between L1/L2/L3 and A1/A2 between L1/L2/L3 and MO/FO between L1/L2/L3 and 13/14
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid / stranded / AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	12.5 mm / 112.2 mm / 114.5 mm
W / H / D	Spring-cage version	12.5 mm / 116.6 mm / 114.5 mm
EMC note		Class A product, see page 525

Ordering data

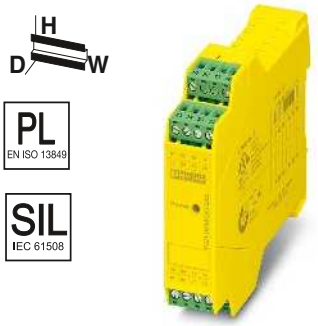
Description	Type	Order No.	Pcs./Pkt.
Safety relay module, for sensor-free downtime monitoring			
with screw connection	**PSR-MM25-1NO-2DO-24DC-SC**	2702355	1
with spring-cage connection	**PSR-MM25-1NO-2DO-24DC-SP**	2702356	1

Safe coupling relays

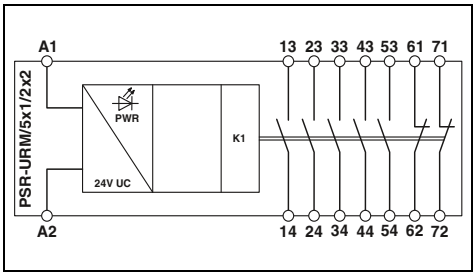
– Single- or two-channel control
– Forcibly guided contacts according to EN 50205
– Up to Cat. 1/PL c according to EN ISO 13849-1, SILCL 1 according to IEC 62061



Reliable signal exchange between two systems with confirmation function.



5 N/O contacts, 2 N/C contacts, for U_S = 24 V AC/DC or 120 V AC/DC



Technical data

Input data			
Rated control supply voltage U_S		24 V AC/DC -15 % / +10 %	120 V AC/DC -20 % ... +10 %
Rated control supply current I_S		typ. 47 mA	typ. 11 mA
Typ. starting time with U_s		20 ms (when controlled via A1)	20 ms (when controlled via A1)
Typical release time		20 ms (when controlled via A1)	20 ms (when controlled via A1)
Output data			
Contact type		5 enabling current paths 2 confirmation current paths	
Contact material		$AgSnO_2$	
Max./min. switching voltage		250 V AC/DC / 5 V AC/DC	
Limiting continuous current		6 A (N/O contact) , 3 A (N/C contact)	
Max./min. inrush current		6 A / 10 mA	
Switching capacity (360/h cycles)		4 A (24 V (DC13)) ; 4 A (250 V (AC15))	
Switching capacity (3600/h cycles)		3 A (24 V (DC13)) ; 3 A (250 V (AC15))	
General data			
Ambient temperature range		-20 °C ... 55 °C (observe derating)	
Air and creepage distances between the circuits		DIN EN 50178: 1998-04	
Rated surge voltage/insulation		Basic insulation 4 kV between all current paths and housing	
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	
Spring-cage connection solid / stranded / AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16	
Dimensions	Screw version	22.5 mm / 114.5 mm / 99 mm	
W / H / D	Spring-cage version	22.5 mm / 114.5 mm / 112 mm	
EMC note		Class A product, see page 525	

Ordering data

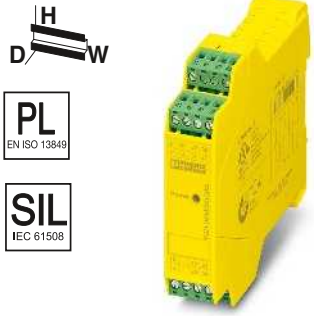
Description	Type	Order No.	Pcs./Pkt.
Coupling relay, with forcibly guided contacts			
with screw connection for 24 V AC/DC	**PSR-SCP- 24UC/URM/5X1/2X2**	2963747	1
with spring-cage connection for 24 V AC/DC	**PSR-SPP- 24UC/URM/5X1/2X2**	2963970	1
Coupling relay, with forcibly guided contacts			
with screw connection for 120 V AC/DC	**PSR-SCP-120UC/URM/5X1/2X2**	2981402	1
with spring-cage connection for 120 V AC/DC	**PSR-SPP-120UC/URM/5X1/2X2**	2981415	1

Safe coupling relays

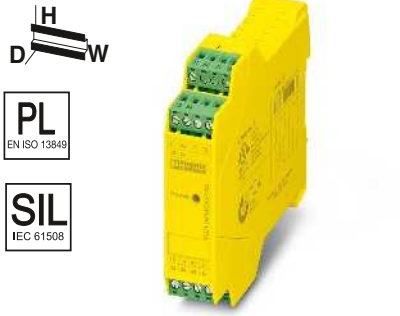
– Single- or two-channel control
– Forcibly guided contacts according to EN 50205
– Up to Cat. 1/PL c according to EN ISO 13849-1, SILCL 1 according to IEC 62061

Notes:

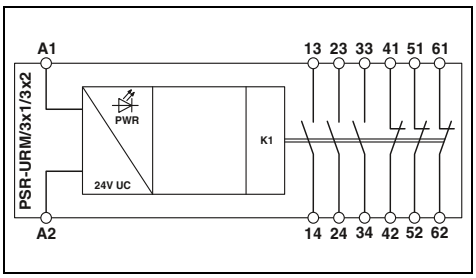
Marking systems and mounting material
See Catalog 3

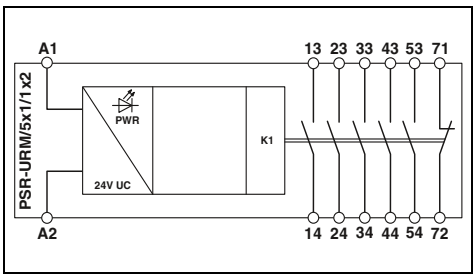


3 N/O contacts, 3 N/C contacts, for U_S = 24 V AC/DC



5 N/O contacts, 1 N/C contact, for U_S = 24 V AC/DC





Technical data

Input data			
Rated control supply voltage U_S		24 V AC/DC -15 % / +10 %	24 V AC/DC -15 % / +10 %
Rated control supply current I_S		typ. 45 mA	typ. 47 mA
Typical response time		-	-
Typical release time		15 ms (when controlled via A1)	20 ms (when controlled via A1)
Output data			
Contact type		3 enabling current paths 3 signaling current paths	5 enabling current paths 1 signaling current path
Contact material		$AgSnO_2$	$AgSnO_2$
Max./min. switching voltage		250 V AC/DC / 5 V AC/DC	250 V AC/DC / 5 V AC/DC
Limiting continuous current		6 A (N/O contact) , 3 A (N/C contact)	6 A (N/O contact) , 6 A (N/C contact)
Max./min. inrush current		8 A / 10 mA	6 A / 10 mA
General data			
Ambient temperature range		-20 °C ... 55 °C (observe derating)	-20 °C ... 55 °C (observe derating)
Air and creepage distances between the circuits		DIN EN 50178: 1998-04	DIN EN 50178: 1998-04
Rated surge voltage/insulation		Basic insulation 4 kV between all current paths and housing	4 kV / basic isolation (safe isolation, reinforced isolation and 6 kV between A1/A2, 53/54, 71/72 and 13/14, 23/24, 33/34, 43/44.)
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid / stranded / AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	22.5 mm / 114.5 mm / 99 mm	22.5 mm / 114.5 mm / 99 mm
W / H / D	Spring-cage version	22.5 mm / 114.5 mm / 112 mm	22.5 mm / 114.5 mm / 112 mm
EMC note			Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Coupling relay, with forcibly guided contacts			
with screw connection	**PSR-SCP- 24UC/URM/3X1/3X2**	2981839	1
with spring-cage connection	**PSR-SPP- 24UC/URM/3X1/3X2**	2981842	1
Universal safety relay, with forcibly guided contacts			
with screw connection for 120 V AC/DC			
Relay, with forcibly guided contacts			

Ordering data

Type	Order No.	Pcs./Pkt.
PSR-SCP- 24UC/URM/5X1/1X2	2981952	1
PSR-SPP- 24UC/URM/5X1/1X2	2981965	1

PL EN ISO 13849

SIL IEC 61508

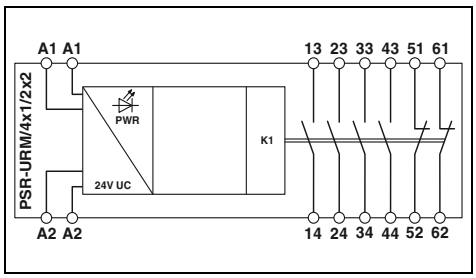
4 N/O contacts, 2 N/C contact, for U_S = 24 V AC/DC

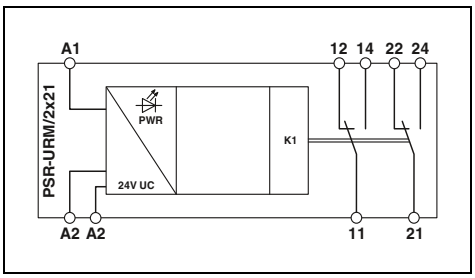
PL EN ISO 13849

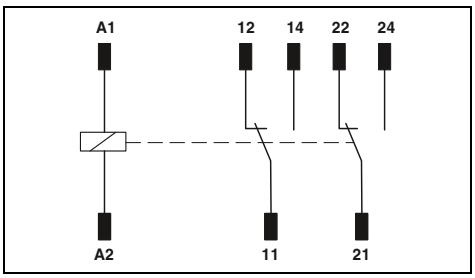
SIL IEC 61508

2 PDTs, for U_S = 24 V AC/DC or 120 V AC/DC

2 PDTs, for U_S = 24 V DC







Technical data

24 V AC/DC -20 % ... +10 %	
typ. 52 mA	
-	
10 ms (when controlled via A1)	
4 enabling current paths	
2 signaling current paths	
$AgSnO_2$	
250 V AC/DC / 5 V AC/DC	
6 A (N/O contact) , 3 A (N/C contact)	
6 A / 10 mA	
-20 °C ... 55 °C (observe derating)	
DIN EN 50178: 1998-04	
4 kV / Basic isolation, (safe isolation, reinforced insulation and 6 kV between input circuit and enabling current paths.)	
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	
0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16	
40 mm / 111 mm / 55 mm	
22 mm / 114.5 mm / 50.1 mm	
Class A product, see page 525	

Technical data

24 V AC/DC -15 % ... +10 %	120 V AC/DC -15 % ... +10 %
typ. 30 mA	typ. 9 mA
10 ms (when controlled via A1)	10 ms (when controlled via A1)
2 PDT	
AgNi	
250 V AC/DC / 5 V AC/DC	
5 A (N/O contact) , 3.5 A (N/C contact)	
6 A / 10 mA	
-20 °C ... 50 °C (observe derating)	
DIN EN 50178: 1998-04	
4 kV/basic insulation (safe isolation, reinforced insulation, and 6 kV between logic and signaling current paths).	
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	
-	
17.5 mm / 75 mm / 60.5 mm	
-	
Class A product, see page 525	

Technical data

24 V DC -15 % / +10 %
typ. 29 mA
10 ms
4 ms
2 PDT
AgNi
250 V AC/DC / 15 V
6 A (N/O contact) , 6 A (N/C contact)
6 A / 10 mA
-25 °C ... 70 °C
DIN EN 50178
6 kV / Safe isolation, increased insulation
-
-
12.6 mm / 29 mm / 25.5 mm
-

Ordering data

Type	Order No.	Pcs./Pkt.
PSR-SCF- 24UC/URM/4X1/2X2	2981444	1
PSR-SPF- 24UC/URM/4X1/2X2	2981457	1

Ordering data

Type	Order No.	Pcs./Pkt.
PSR-SCF- 24UC/URM/2X21	2981363	10
PSR-SCF-120UC/URM/2X21	2981376	10

Ordering data

Type	Order No.	Pcs./Pkt.
REL-SR- 24DC/2X21	2961574	10

Select PRS-SIL coupling relay

Select Termination Carrier TC...

Select controller-specific front adapter and system cable

Solutions also available for MACX and MINI Analog

Compatible with a range of different higher-level control systems

A high degree of integrity and reliability are the primary demands of the process industry when it comes to systems and components. Phoenix Contact offers highly compact, safe coupling relays for electrical isolation and power adaptation which are tailored to the relevant process control systems and the special requirements of this industry.

More than an idea

By using our own forcibly guided elementary relays, which have been developed in accordance with DIN EN 50205, we can combine high switching capacity, easy and reliable diagnostics, and a very low overall width.

One range – countless possibilities

Built for use in environments with more stringent requirements than the standard, the modules in the PSRmini range have an extensive test and approval package. For example, this means that these components can be operated in particularly corrosive atmospheres, in potentially explosive areas, and under extreme temperature conditions.

Cabling with system

For projects with a high channel density, it is recommended that a Termination Carrier is used. Termination Carriers are compact solutions for conveniently and smoothly connecting standard DIN rail devices from the entire PSR range to output modules of automation systems.

Safe off – safe on

Both safety-related circuit interrupts and safe switch on are becoming increasingly important. This particular application is addressed in our portfolio by a special product which is characterized by its extremely comprehensive diagnostic measures on the load side.

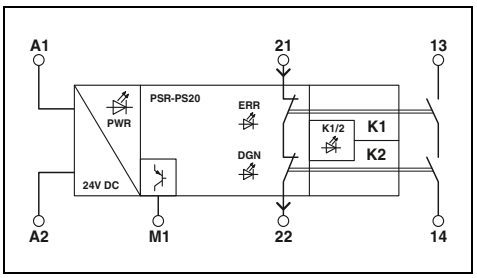
Whether emergency shutdown (ESD) or fire and gas (F&G) applications, every safety signal is sent with certainty thanks to the SIL-certified coupling modules from Phoenix Contact.

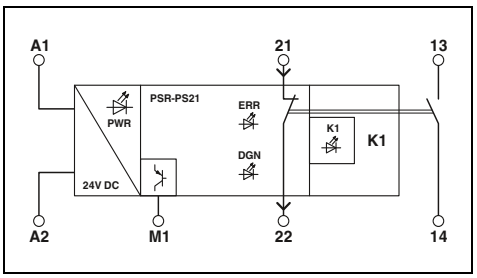
Highly compact, safe coupling relays for failsafe controllers

- SIL coupling relay for safety-related switching off
- Single- or two-channel control
- 1 enabling current path, 1 digital signal output, 1 diagnostic current path
- Easy proof test
- Active error acknowledgment via A1
- Integrated test pulse filter
- Forcibly guided contacts according to EN 50205
- Up to SIL 3 according to IEC 61508, IEC 61511, and IEC 50156
- Additional approvals: ATEX, IECEx, Class 1 Zone 2, G3, GL

SIL 3 according to IEC 61508, 1 enabling current path, 1 diagnostic current path

SIL 2 according to IEC 61508, 1 enabling current path, 1 diagnostic current path





Technical data

Input data		
Rated control supply voltage U_S		24 V DC -15 % / +10 %
Rated control supply current I_S		typ. 45 mA
Typ. starting time with U_s		< 100 ms (when controlled via A1)
Typical release time		< 35 ms (when controlled via A1)
Recovery time		500 ms
Output data		
Contact type		1 enabling current path 1 confirmation current path
Contact material		$AgSnO_2$ (enabling current path)
Max./min. switching voltage		250 V AC/DC / 12 V AC/DC
Limiting continuous current		6 A (N/O contact, pay attention to the derating) , 100 mA (N/C contact)
Max./min. inrush current		6 A (N/O contact) , 100 mA (N/C contact) / 3 mA
Switching capacity		min. 60 mW
Short-circuit protection of the output circuits		6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications) 150 mA fast blow (Confirmation current path)
Alarm outputs		
Number of outputs		1 (digital, PNP)
Output current		max. 100 mA
Short-circuit protection		no
Output fuse		150 mA fast blow (signal output)
General data		
Ambient temperature range		-40 °C ... 70 °C (observe derating)
Air and creepage distances between the circuits		DIN EN 50178, EN 60079-15
Rated surge voltage/insulation		Safe isolation, 6 kV reinforced insulation from control circuit, start circuit, confirmation current path, signal output to the enabling current path; 4 kV/basic insulation between all current paths and housing
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 26 - 12
Dimensions	W / H / D	6.8 mm / 93.1 mm / 102.5 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Coupling relay for failsafe controllers			
	PSR-PS20-1NO-1NC-24DC-SC	2700356	1

Technical data

Input data		
Rated control supply voltage U_S		24 V DC -15 % / +10 %
Rated control supply current I_S		typ. 45 mA
Typ. starting time with U_s		< 100 ms (when controlled via A1)
Typical release time		< 35 ms (when controlled via A1)
Recovery time		500 ms
Output data		
Contact type		1 enabling current path 1 confirmation current path
Contact material		$AgSnO_2$ (enabling current path)
Max./min. switching voltage		250 V AC/DC / 10 V AC/DC
Limiting continuous current		6 A (N/O contact, pay attention to the derating) , 100 mA (N/C contact)
Max./min. inrush current		6 A (N/O contact) , 100 mA (N/C contact) / 3 mA
Switching capacity		min. 30 mW
Short-circuit protection of the output circuits		6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications) 150 mA fast blow (Confirmation current path)
Alarm outputs		
Number of outputs		1 (digital, PNP)
Output current		max. 100 mA
Short-circuit protection		no
Output fuse		150 mA fast blow (signal output)
General data		
Ambient temperature range		-40 °C ... 65 °C (observe derating)
Air and creepage distances between the circuits		DIN EN 50178, EN 60079-15
Rated surge voltage/insulation		Safe isolation, 6 kV reinforced insulation from control circuit, start circuit, confirmation current path, signal output to the enabling current path; 4 kV/basic insulation between all current paths and housing
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 26 - 12
Dimensions	W / H / D	6.8 mm / 93.1 mm / 102.5 mm
EMC note		Class A product, see page 525

Ordering data

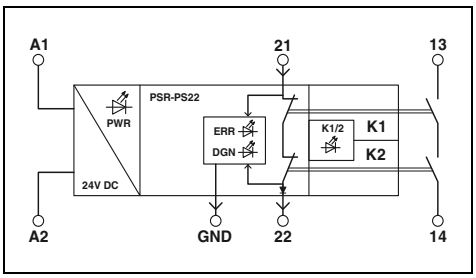
Description	Type	Order No.	Pcs./Pkt.
Coupling relay for failsafe controllers			
	PSR-PS21-1NO-1NC-24DC-SC	2700357	1

Highly compact, safe coupling relays for failsafe controllers

- SIL coupling relay for safety-related switching off
- Single- or two-channel control
- 1 enabling current path, 1 diagnostic current path
- Easy proof test
- Active error acknowledgment via A1
- Integrated test pulse filter
- Forcibly guided contacts according to EN 50205
- Up to SIL 3 according to IEC 61508, IEC 61511, and IEC 50156
- Additional approvals: ATEX, IECEx, Class 1 Zone 2, G3, GL

new

SIL 3 according to IEC 61508, separate diagnostic supply voltage



Technical data

Input data		
Rated control supply voltage U_S		24 V DC -15 % / +10 %
Rated control supply current I_S		typ. 45 mA
Typ. starting time with U_s		150 ms (when controlled via A1-A2)
Typical release time		20 ms (when controlled via A1-A2)
Recovery time		500 ms
Output data		
Contact type		1 enabling current path 1 confirmation current path
Contact material		$AgSnO_2$ (enabling current path)
Max./min. switching voltage		250 V AC/DC / 12 V AC/DC
Limiting continuous current		6 A (N/O contact, pay attention to the derating) , 4 A (N/O contact, for low-demand applications)
Max./min. inrush current		6 A (N/O contact) , 100 mA (N/C contact) / 3 mA
Switching capacity		min. 60 mW (N/O contact)
Short-circuit protection of the output circuits		6 A gL/gG (N/O contact) 4 A gL/gG (N/O contact, for low-demand applications) 150 mA fast blow (N/C contact)
General data		
Ambient temperature range		-40 °C ... 70 °C (observe derating)
Air and creepage distances between the circuits		DIN EN 50178, EN 60079-15
Rated surge voltage/insulation		Safe isolation, 6 kV reinforced insulation from the control circuit and confirmation current path to the enabling current path Basic insulation 4 kV between all current paths and housing
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 26 - 12
Dimensions	W / H / D	6.8 mm / 93.1 mm / 102.5 mm

Ordering data

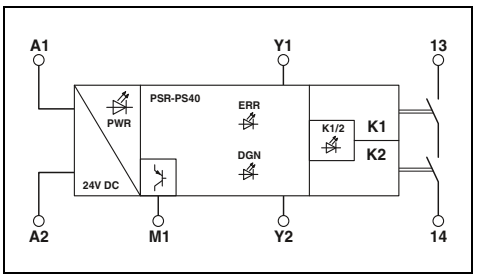
Description	Type	Order No.	Pcs./Pkt.
Coupling relay for failsafe controllers			
	PSR-PS22-1NO-1NC-24VDC-SC	2702524	1

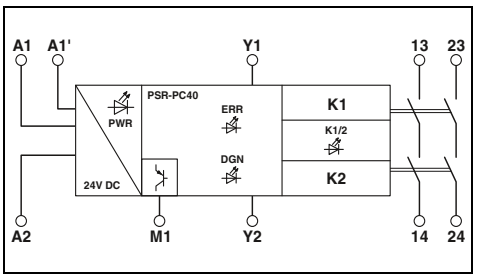
Highly compact, safe coupling relays for failsafe controllers

- SIL coupling relay for safety-related switching off
- Single- or two-channel control
- 2 enabling current paths, 1 digital signal output
- Easy proof test
- Active error acknowledgment via A1
- Integrated test pulse filter
- Self-monitoring, with device-internal locking
- Manual or automatic activation
- Forcibly guided contacts according to EN 50205
- Up to SIL 3 according to IEC 61508, IEC 61511, and IEC 50156
- Additional approvals: ATEX, IECEx, Class 1 Zone 2, G3, GL

SIL 3 according to IEC 61508, 1 enabling current path

SIL 3 according to IEC 61508, 2 enabling current paths





Technical data

Input data		
Rated control supply voltage U_S		24 V DC -15 % / +10 %
Rated control supply current I_S		typ. 50 mA
Typ. starting time with U_s		< 200 ms (when controlled via A1, automatic start)
Typical release time		< 35 ms (when controlled via A1)
Recovery time		500 ms
Output data		
Contact type		1 enabling current path
Contact material		$AgSnO_2$
Max./min. switching voltage		250 V AC/DC / 12 V AC/DC
Limiting continuous current		6 A (observe derating)
Max./min. inrush current		6 A / 3 mA
Switching capacity		min. 60 mW
Short-circuit protection of the output circuits		6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)
Alarm outputs		
Number of outputs		1 (digital, PNP)
Output current		max. 100 mA
Short-circuit protection		no
Output fuse		150 mA fast blow (signal output)
General data		
Ambient temperature range		-40 °C ... 70 °C (observe derating)
Air and creepage distances between the circuits		DIN EN 50178, EN 60079-15
Rated surge voltage/insulation		Safe isolation, reinforced insulation 6 kV from control circuit, start circuit, signal output to the enabling current path; 4 kV / basic insulation between all current paths and housing
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 26 - 12
Spring-cage connection solid / stranded / AWG		-
Dimensions	Screw version	6.8 mm / 93.1 mm / 102.5 mm
W / H / D	Spring-cage version	-
EMC note		Class A product, see page 525

Technical data

Input data		
Rated control supply voltage U_S		24 V DC -15 % / +10 %
Rated control supply current I_S		typ. 75 mA
Typ. starting time with U_s		< 200 ms (when controlled via A1, automatic start)
Typical release time		< 35 ms (when controlled via A1)
Recovery time		500 ms
Output data		
Contact type		2 enabling current paths
Contact material		$AgSnO_2$
Max./min. switching voltage		250 V AC/DC / 12 V AC/DC
Limiting continuous current		6 A (observe derating)
Max./min. inrush current		6 A / 3 mA
Switching capacity		min. 60 mW
Short-circuit protection of the output circuits		6 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications)
Alarm outputs		
Number of outputs		1 (digital, PNP)
Output current		max. 100 mA
Short-circuit protection		no
Output fuse		150 mA fast blow (signal output)
General data		
Ambient temperature range		-40 °C ... 70 °C (observe derating)
Air and creepage distances between the circuits		DIN EN 50178, EN 60079-15
Rated surge voltage/insulation		Safe isolation, 6 kV reinforced insulation from control circuit, start circuit, signal output to the enabling current paths, 4 kV/basic insulation between the enabling current paths and between all current paths and housing
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Spring-cage connection solid / stranded / AWG		0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16
Dimensions	Screw version	12.5 mm / 112.2 mm / 114.5 mm
W / H / D	Spring-cage version	12.5 mm / 116.6 mm / 114.5 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Coupling relay for failsafe controllers			
with screw connection	**PSR-PS40-1NO-1DO-24DC-SC**	2700398	1
Coupling relay for failsafe controllers			
with screw connection	**PSR-PC40-2NO-1DO-24DC-SC**	2700588	1
with spring-cage connection	**PSR-PC40-2NO-1DO-24DC-SP**	2700589	1

Safety relay modules for the process industry – PSRmini

Highly compact, safe coupling relays for failsafe controllers

- SIL coupling relay for safety-related switching off
- Single- or two-channel control
- Easy proof test
- Forcibly guided contacts according to EN 50205
- Up to SIL 3 according to IEC 61508, IEC 61511, and IEC 50156
- Additional approvals: ATEX, IECEx, Class 1 Zone 2, G3, GL

PC20:
- Active error acknowledgment via A1
- 2 internal 5 A fuses
- Integrated test pulse filter
- DIN rail connector for easy bridging of the supply voltage

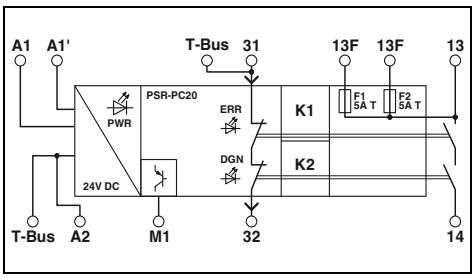
PC32:
- 2 enabling current paths:
  One to 230 V AC/DC
  One to 60 V AC/DC

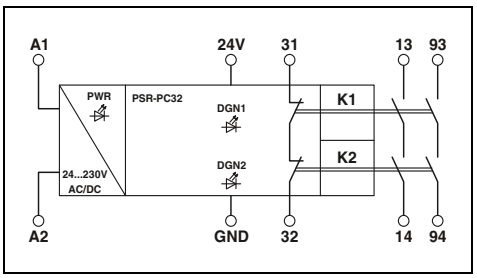
new

SIL 3 according to IEC 61508, 1 enabling current path (protected as an option), 1 diagnostic current path

SIL 3 according to IEC 61508, 2 enabling current paths, 1 diagnostic current path, wide-range input

Ex:





	Technical data	Technical data
Input data		
Rated control supply voltage U_S	24 V DC -15 % / +10 %	24 V AC/DC ... 230 V AC/DC -15 % ... +10 %
Rated control supply current I_S	typ. 50 mA	75 mA (24 V DC)
Typ. starting time with U_s	< 100 ms (when controlled via A1)	-
Typical release time	< 35 ms (when controlled via A1)	< 200 ms (with U_s when controlled via A1)
Recovery time	500 ms	< 500 ms
Output data		
Contact type	1 enabling current path 1 confirmation current path	2 enabling current paths 1 confirmation current path
Contact material	$AgSnO_2$ (enabling current path)	$AgSnO_2$ (enabling current path)
Max./min. switching voltage	250 V AC/DC / 12 V AC/DC	250 V AC/DC / 12 V AC/DC
Limiting continuous current	6 A (13/14, see to derating) , 4 A (13F/14, see to derating)	6 A (N/O contact, pay attention to the derating) , 100 mA (N/C contact)
Max./min. inrush current	6 A (N/O contact) , 100 mA (N/C contact) / 3 mA	6 A (N/O contact) , 100 mA (N/C contact) / 3 mA
Switching capacity	min. 60 mW	min. 60 mW (N/O contact)
Short-circuit protection of the output circuits	6 A gL/gG (N/O contact 13/14) 4 A gL/gG (for low-demand applications) 150 mA fast blow (Confirmation current path)	6 A gL/gG (N/O contact) 4 A gL/gG (N/O contact, for low-demand applications) 150 mA fast blow (Confirmation current path)
Alarm outputs		
Number of outputs	1 (digital, PNP)	-
Output current	max. 100 mA	-
Short-circuit protection	no	-
Output fuse	150 mA fast blow (signal output)	-
General data		
Ambient temperature range	-40 °C ... 70 °C (observe derating)	-40 °C ... 70 °C (observe derating)
Air and creepage distances between the circuits	DIN EN 50178, EN 60079-15	DIN EN 50178; EN 60947-5-1
Rated surge voltage/insulation	Safe isolation, 6 kV reinforced insulation from control circuit, start circuit, confirmation current path, signal output to the enabling current path; 4 kV/basic insulation between all current paths and housing	Basic insulation 4 kV between all current paths and housing Safe isolation, reinforced insulation 2.5 kV between (93/94) and (31/32, 24V/GND) Safe isolation, reinforced insulation 6 kV: between (A1/A2) and (13/14) and (31/32, 24V/GND) between (A1/A2) and (93/94) between (13/14) and (93/94)
Screw connection solid/stranded/AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid / stranded / AWG	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions W / H / D — Screw version	12.5 mm / 112.2 mm / 114.5 mm	17.5 mm / 112.2 mm / 114.5 mm
Dimensions W / H / D — Spring-cage version	12.5 mm / 116.6 mm / 114.5 mm	17.5 mm / 117.4 mm / 114.5 mm
EMC note	Class A product, see page 525	Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Coupling relay for failsafe controllers			
with screw connection	**PSR-PC20-1NO-1NC-24DC-SC**	2700577	1
with spring-cage connection	**PSR-PC20-1NO-1NC-24DC-SP**	2700578	1

Accessories

DIN rail connector (TBUS), for bridging the supply voltage, with UL approval	**ME 6,2 TBUS-2 1,5/5-ST-3,81 GN**	2869728	10
MINI COMBICON connectors	**MC 1,5/ 5-ST-3,81**	1803604	250

Ordering data

Type	Order No.	Pcs./Pkt.
PSR-PC32-2NO-1NC-24-230UC-SC	2700581	1
PSR-PC32-2NO-1NC-24-230UC-SP	2700582	1

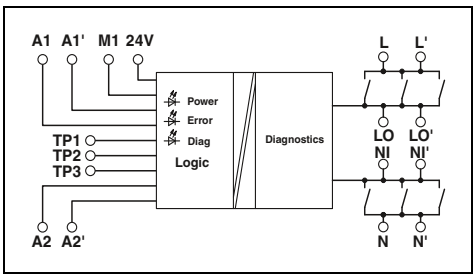
Accessories

Highly compact, safe coupling relays for failsafe controllers

- SIL coupling relay for safety-related switch on
- Single- or two-channel control
- 1 enabling current path, 1 digital signal output
- Can be used in low-demand applications
- Easy proof test
- Active error acknowledgment via A1
- Integrated test pulse filter
- Up to SIL 3 according to IEC 61508 and IEC 61511
- Additional approvals: ATEX, IECEx, Class 1 Zone 2, GL

Coupling relay for safe switch-on (F&G) certified according to SIL 3

Ex:



Technical data

Input data		
Rated control supply voltage U_S		24 V DC -15 % / +10 % (A1/A2 and 24V/A2)
Rated control supply current I_S		typ. 65 mA (A1/A2)
Typ. starting time with U_s		30 ms (when controlled via A1)
Typical release time		30 ms (when controlled via A1)
Recovery time		1 s
Output data		
Contact type		1 enabling current path
Contact material		AgNi, gold-flashed
Max./min. switching voltage		250 V AC / 15 V AC/DC
Limiting continuous current		5 A (N/O contact)
Max./min. inrush current		5 A / 100 mA
Switching capacity		min. 1.5 W
Alarm outputs		
Number of outputs		1 (digital)
Output current		max. 100 mA
Short-circuit protection		no
Output fuse		150 mA fast blow (signal output)
General data		
Ambient temperature range		-20 °C ... 55 °C
Air and creepage distances between the circuits		DIN EN 50178
Rated surge voltage/insulation		6 kV/safe isolation (through protective impedance)
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Spring-cage connection solid / stranded / AWG		0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16
Dimensions	Screw version	17.5 mm / 112.2 mm / 114.5 mm
W / H / D	Spring-cage version	17.5 mm / 117.4 mm / 114.5 mm
EMC note		Class A product, see page 525

Ordering data

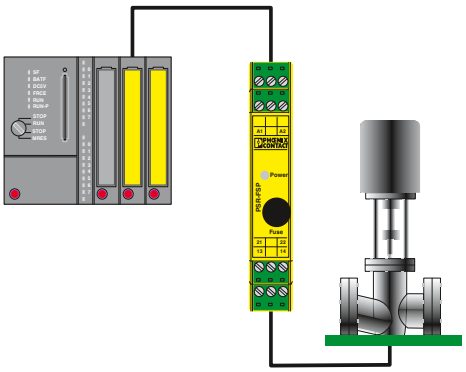
Description	Type	Order No.	Pcs./Pkt.
Coupling relay for failsafe controllers			
with screw connection	**PSR-PC50-1NO-1DO-24DC-SC**	2904664	1
with spring-cage connection	**PSR-PC50-1NO-1DO-24DC-SP**	2904665	1

Emergency stop coupling relay for failsafe controllers

- SIL coupling relay for safety-related switching off
- Single- or two-channel control
- 1 enabling current path, 1 confirmation current path
- Can be used in high and low-demand applications
- Easy proof test
- Integrated test pulse filter
- Replaceable fuse
- Forcibly guided contacts according to EN 50205
- Up to SIL 3 according to IEC 61508, IEC 61511, and IEC 50156

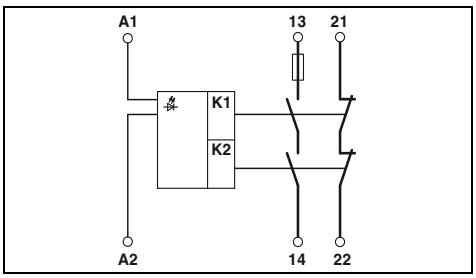
Notes:

Can be used for system cabling with the Termination Carrier. For further information, see page 289



Example of electrical isolation of a safety PLC output from the field.

SIL 3 according to IEC 61508, 1 protected enabling current path



Technical data

Input data		
Rated control supply voltage U_S		24 V DC -15 % / +10 %
Rated control supply current I_S		typ. 55 mA
Typ. starting time with U_s		50 ms
Typical release time		50 ms
Recovery time		1 s
Output data		
Contact type		1 enabling current path 1 confirmation current path
Contact material		AgCuNi, + 0.2 µm Au
Max./min. switching voltage		250 V AC/DC / 15 V AC/DC
Limiting continuous current		5 A (N/O contact, pay attention to the derating) , 100 mA (N/C contact)
Max./min. inrush current		5 A (N/O contact) , 100 mA (N/C contact) / 5 mA
Switching capacity (3600/h cycles)		5 A (24 V (DC13)) ; 5 A (230 V (AC15))
Short-circuit protection of the output circuits		5 A T fuse (N/O contact) 4 A gL/gG (N/C contact)
General data		
Ambient temperature range		-20 °C ... 55 °C (observe derating)
Air and creepage distances between the circuits		DIN EN 50178/VDE 0160
Rated surge voltage/insulation		Safe isolation, reinforced insulation 6 kV between the control circuits (A1/A2), (21/22), (13/14)
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Spring-cage connection solid / stranded / AWG		0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16
Dimensions	Screw version	17.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	17.5 mm / 112 mm / 114.5 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Emergency stop coupling relay for failsafe controllers in process engineering, with secured enabling current path			
with screw connection	**PSR-SCP- 24DC/FSP/1X1/1X2**	2981978	1
with spring-cage connection	**PSR-SPP- 24DC/FSP/1X1/1X2**	2981981	1

Emergency stop coupling relay for failsafe controllers

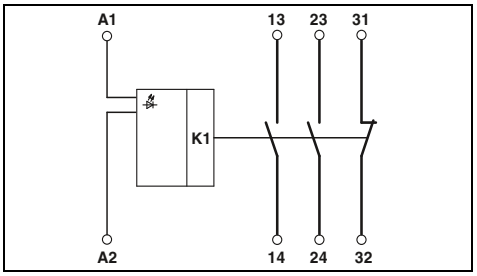
- SIL coupling relay for safety-related switching off
- Single- or two-channel control
- 2 enabling current paths, 1 confirmation current path
- Can be used in high and low-demand applications
- Easy proof test
- Integrated test pulse filter
- Forcibly guided contacts according to EN 50205
- Up to SIL 2/3 according to IEC 61508, IEC 61511, and IEC 50156

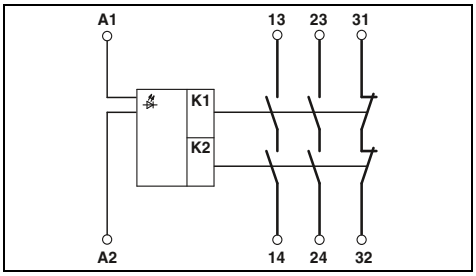
Notes:

Can be used for system cabling with the Termination Carrier. For further information, see page 289

SIL 2 according to IEC 61508, 2 enabling current paths

SIL 3 according to IEC 61508, 2 enabling current paths





Technical data

Input data			
Rated control supply voltage U_S		24 V DC -15 % / +10 %	24 V DC -15 % / +10 %
Rated control supply current I_S		typ. 55 mA	typ. 55 mA
Typ. starting time with U_s		50 ms	50 ms
Typical release time		50 ms	50 ms
Recovery time		1 s	1 s
Output data			
Contact type		2 enabling current paths 1 confirmation current path	2 enabling current paths 1 confirmation current path
Contact material		AgCuNi, + 0.2 µm Au	AgCuNi, + 0.2 µm Au
Max./min. switching voltage		250 V AC/DC / 15 V AC/DC	250 V AC/DC / 15 V AC/DC
Limiting continuous current		5 A (N/O contact, pay attention to the derating) , 100 mA (N/C contact)	5 A (N/O contact, pay attention to the derating) , 100 mA (N/C contact)
Max./min. inrush current		5 A (N/O contact) , 100 mA (N/C contact) / 5 mA	5 A (N/O contact) , 100 mA (N/C contact) / 5 mA
Switching capacity (3600/h cycles)		5 A (24 V (DC13)) ; 5 A (230 V (AC15))	5 A (24 V (DC13)) ; 5 A (230 V (AC15))
Short-circuit protection of the output circuits		10 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications) 4 A gL/gG (N/C contact)	10 A gL/gG (N/O contact) 4 A gL/gG (for low-demand applications) 4 A gL/gG (N/C contact)
General data			
Ambient temperature range		-20 °C ... 55 °C (observe derating)	-20 °C ... 55 °C (observe derating)
Air and creepage distances between the circuits		DIN EN 50178/VDE 0160	DIN EN 50178/VDE 0160
Rated surge voltage/insulation		Safe isolation, reinforced insulation 6 kV between the control circuits (A1/A2), (31/32), (13/14, 23/24)	Safe isolation, reinforced insulation 6 kV between the control circuits (A1/A2), (31/32), (13/14, 23/24)
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Spring-cage connection solid / stranded / AWG		0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16	0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16
Dimensions	Screw version	17.5 mm / 99 mm / 114.5 mm	17.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	17.5 mm / 112 mm / 114.5 mm	17.5 mm / 112 mm / 114.5 mm
EMC note		Class A product, see page 525	Class A product, see page 525

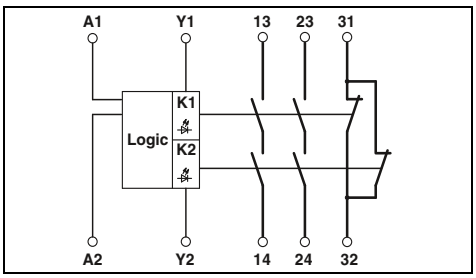
Ordering data

Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Emergency stop coupling relay, for failsafe controllers, two enabling current paths, **SIL 2 according to IEC 61508**						
with screw connection	**PSR-SCP- 24DC/FSP2/2X1/1X2**	2986575	1			
with spring-cage connection	**PSR-SPP- 24DC/FSP2/2X1/1X2**	2986588	1			
Emergency stop coupling relay, for failsafe controllers, two enabling current paths, **SIL 3 according to IEC 61508**						
with screw connection				**PSR-SCP- 24DC/FSP/2X1/1X2**	2986960	1
with spring-cage connection				**PSR-SPP- 24DC/FSP/2X1/1X2**	2986957	1

Safe coupling relay for emergency stop and safety door monitoring

- SIL coupling relay for safety-related switching off
- Single and two-channel control
- 2 enabling current paths, 1 confirmation current path
- Manual and automatic activation in a single device
- With inrush current reduction, therefore suitable for coupling to failsafe controllers
- Forcibly guided contacts according to EN 50205
- Up to SIL 3 according to IEC 61508 and IEC 61511

Manual or automatic activation, also suitable for failsafe PLC



Technical data

Input data		
Rated control supply voltage U_S		24 V DC -15 % / +10 %
Rated control supply current I_S		typ. 50 mA DC
Typical response time		60 ms (Automatic/manual start)
Typical release time		20 ms
Recovery time		approx. 1 s
Output data		
Contact type		2 enabling current paths 1 signaling current path (type B according to EN 50205)
Contact material		$AgSnO_2$, gold-flashed
Max./min. switching voltage		250 V AC/DC / 10 V
Limiting continuous current		6 A (N/O contact/N/C contact, high demand) , 4 A (N/O contact/N/C contact, low demand)
Max./min. inrush current		6 A / 10 mA
Switching capacity (360/h cycles)		5 A (24 V DC) ; 5 A (230 V AC)
Switching capacity (3600/h cycles)		5 A (24 V (DC13)) ; 5 A (230 V (AC 15))
Short-circuit protection of the output circuits		6 A gL/gG NEOZED (High demand) 4 A gL/gG NEOZED (Low demand)
General data		
Ambient temperature range		-20 °C ... 55 °C
Air and creepage distances between the circuits		DIN EN 50178/VDE 0160
Rated surge voltage/insulation		6 kV / Safe isolation, increased insulation
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid / stranded / AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	22.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	22.5 mm / 112 mm / 114.5 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Process technology, emergency stop and safety door monitoring, one-channel, activation: manual and automatic			
with screw connection	**PSR-SCP- 24DC/ESP4/2X1/1X2**	2981020	1
with spring-cage connection	**PSR-SPP- 24DC/ESP4/2X1/1X2**	2981017	1

Termination Carriers for coupling relays

- Convenient and faultless connection using pre-assembled system cables
- 1:1 signal allocation to a 37-pos. D-SUB connector
- Redundant power supply, decoupled from diode and protected against polarity reversal
- Integrated undervoltage detection with separate signal path

Notes:

Cable and jumper plugs are not supplied as standard with the Termination Carriers.

PSRmini – Termination Carriers for highly compact coupling relays can be found at phoenixcontact.net/products.

Termination Carrier for up to 16 PSR-FSP modules

Termination Carrier for up to 16 PSR-PC50 modules

EAC

Housing width 304 mm

Technical data

General data	
Connection to the control system level	D-SUB pin strip
Number of positions	37
Maximum operating voltage	< 50 V DC (Per signal/channel)
Maximum permissible current	1 A (Signal/channel)
Rated insulation voltage	50 V
Degree of pollution	2
Overvoltage category	II
Ambient temperature range	-20 °C ... 60 °C
Inflammability class in acc. with UL 94	V0
Dimensions W/H/D	304 / 170 / 160 mm
EMC note	Class A product, see page 525
Supply	
Input voltage range	21.1 V DC ... 26.4 V DC
Redundant supply	yes, decoupled from diodes
Polarization and surge protection	Yes
Fuse	2.5 A on PCB, slow-blow (replaceable)
Status indicator	2 x red LED (error) 2x green LEDs (PWR1 and PWR2)
Undervoltage monitoring	At < 18 V (alarm contact, 1 N/O contact)

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Termination Carrier for 16 coupling relays			
For safety-related **switching off**	**TC-2D37SUB-DO16-ESD-AR-UNI**	2902913	1
For safety-related **switching on**			

Accessories

Cable set without use of confirmation contact, suitable for PSR-FSP/Order No.: 2981978	**TC-C-PSR3-SC-A10000A20000**	2903389	16
Cable set with use of confirmation contact, suitable for PSR-FSP/Order No.: 2986960 and 2986575	**TC-C-PSR3-SC-A10000A23132**	2903390	16
Jumper plug for occupying unused module slots, suitable for PSR-FSP/Order No.: 2986960 and 2986575	**TC-C-PTSM-50-00000000J1J1**	2903388	8
Cable set			

Housing width 304 mm

Technical data

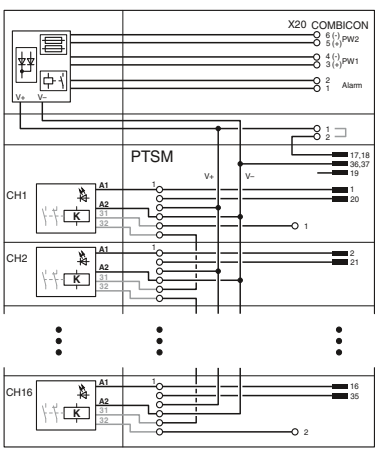
General data	
Connection to the control system level	D-SUB pin strip
Number of positions	37
Maximum operating voltage	< 50 V DC (Per signal/channel)
Maximum permissible current	1 A (Signal/channel)
Rated insulation voltage	50 V
Degree of pollution	2
Overvoltage category	II
Ambient temperature range	-20 °C ... 60 °C
Inflammability class in acc. with UL 94	V0
Dimensions W/H/D	304 / 170 / 160 mm
EMC note	Class A product, see page 525
Supply	
Input voltage range	21.1 V DC ... 26.4 V DC
Redundant supply	yes, decoupled from diodes
Polarization and surge protection	Yes
Fuse	2.5 A on PCB, slow-blow (replaceable)
Status indicator	2 x red LED (error) 2x green LEDs (PWR1 and PWR2)
Undervoltage monitoring	At < 18 V (alarm contact, 1 N/O contact)

Ordering data

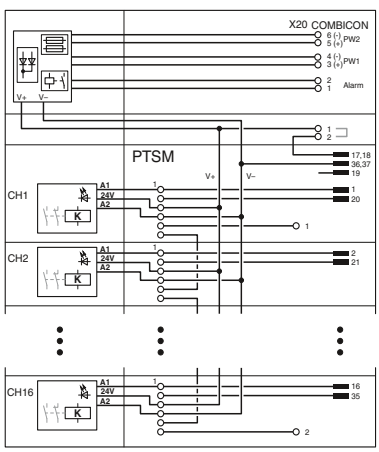
Type	Order No.	Pcs./Pkt.
TC-2D37SUB-DO16-F&G-AR-UNI	2902914	1

Accessories

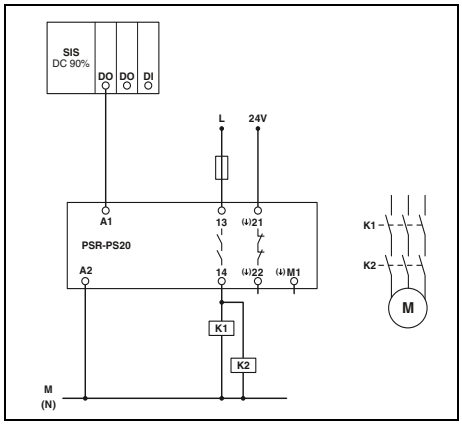
Type	Order No.	Pcs./Pkt.
TC-C-PCX3-SC-A100V+A20000	2906003	16



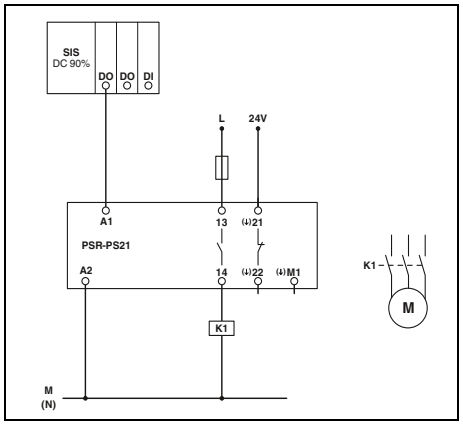
Connection scheme TC-2D37SUB-DO16-ESD-AR-UNI



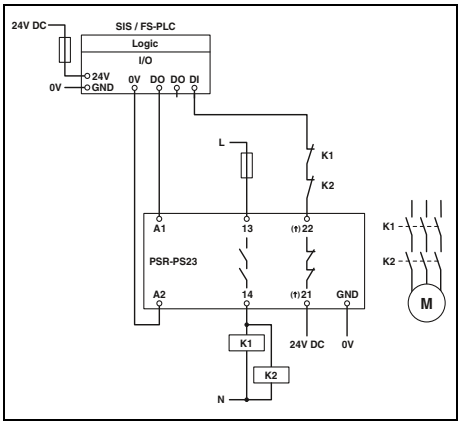
Connection scheme TC-2D37SUB-DO16-F&G-AR-UNI



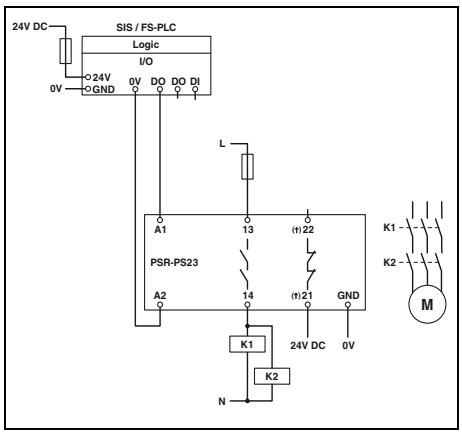
PSR-PS20
– Single-channel control via A1 with diagnostic supply voltage applied to contact 21
– Suitable for low-demand applications



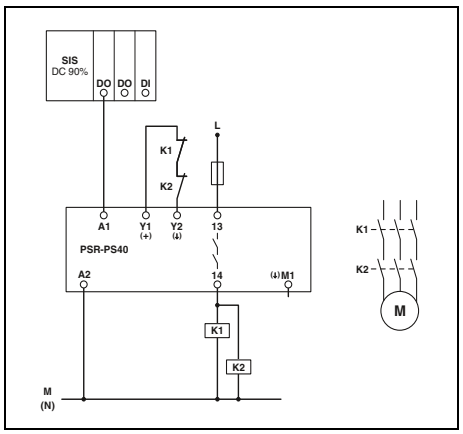
PSR-PS21
– Single-channel control via A1 with diagnostic supply voltage applied to contact 21
– Suitable for low-demand applications



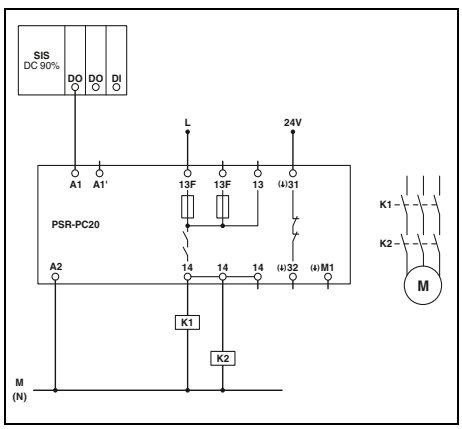
PSR-PS22
– Single-channel control via A1 with diagnostic supply voltage applied to contact 21
– Integration of the confirmation current path
– Suitable for high-demand applications



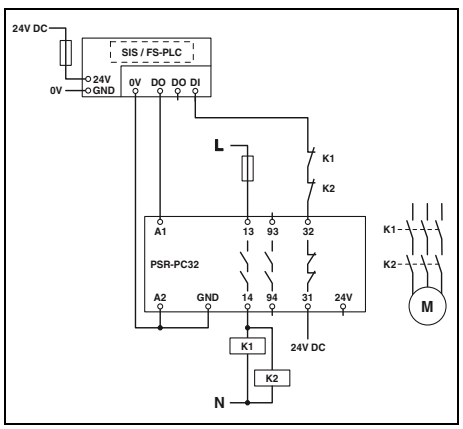
PSR-PS22
– Single-channel control via A1 with diagnostic supply voltage applied to contact 21
– Suitable for low-demand applications



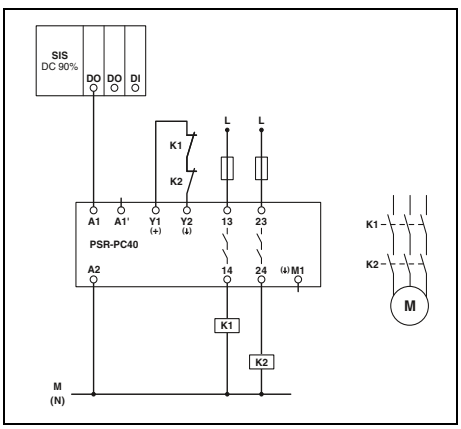
PSR-PS40
– Single-channel control via A1 with automatic activation
– Suitable for low-demand applications



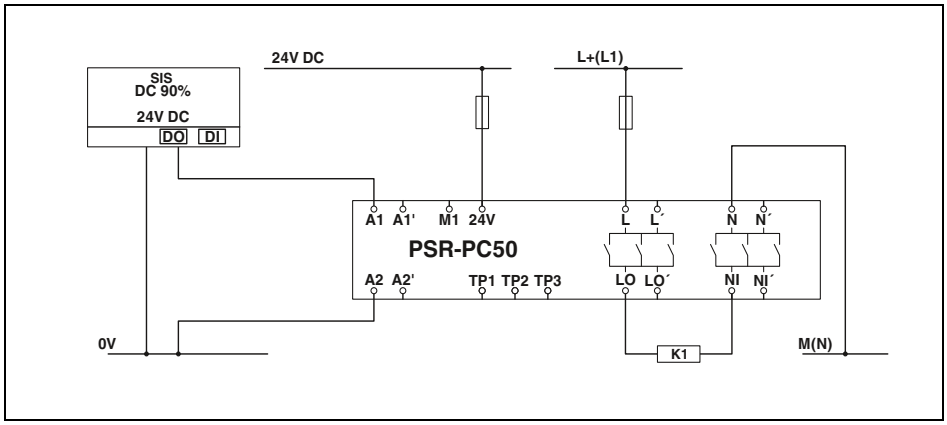
PSR-PC20
– Single-channel control via A1 with diagnostic supply voltage applied to contact 31
– Suitable for low-demand applications



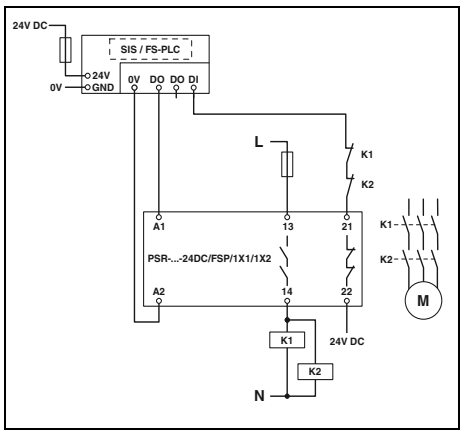
PSR-PC32
– Single-channel control via A1 with integration of the confirmation current path
– Suitable for high-demand applications



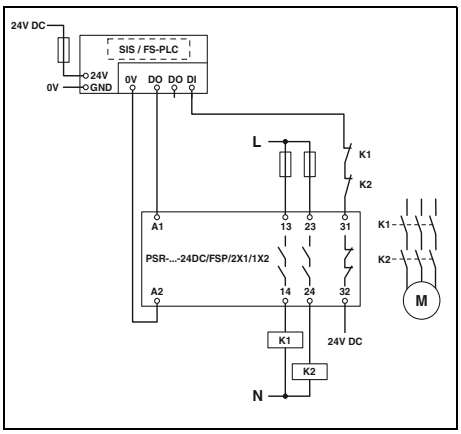
PSR-PC40
– Single-channel control via A1 with automatic activation
– Suitable for low-demand applications



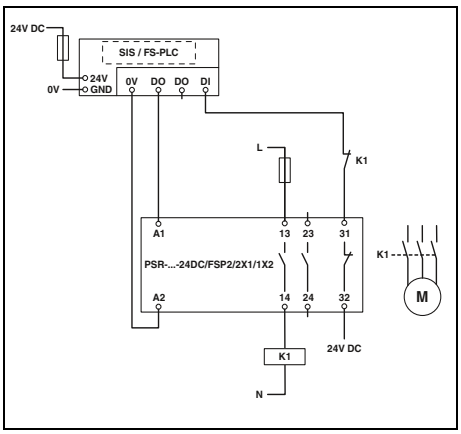
PSR-PC50
– Single-channel control via A1 with diagnostic supply voltage applied
– Suitable for low-demand applications



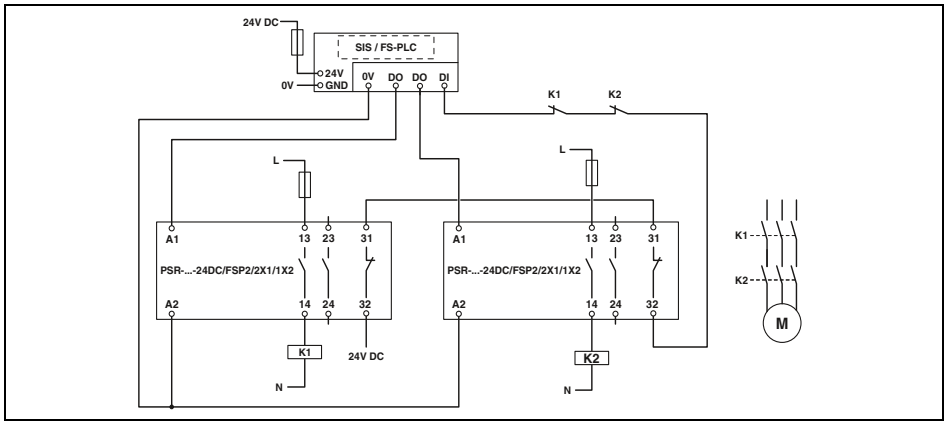
PSR-FSP/1X1
– Single-channel control with integration of the confirmation current path
– Suitable for high- and low-demand applications



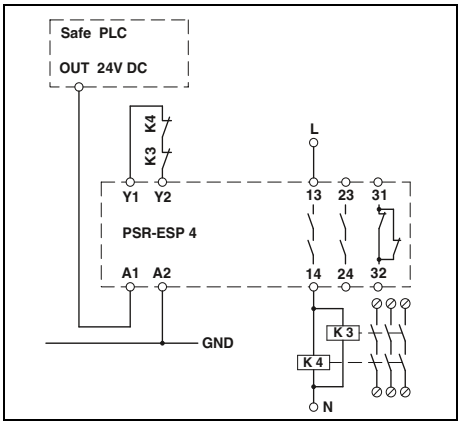
PSR-FSP/2X1
– Two-channel control with integration of the confirmation path
– Suitable for high- and low-demand applications



PSR-FSP2/2X1
– Single-channel control via A1 with integration of the confirmation current path
– Suitable for high- and low-demand applications



PSR-FSP2/2X1
– Two-channel control with integration of the confirmation path
– Suitable for high- and low-demand applications



PSR-ESP4
– Single-channel connection to failsafe controller with automatic start

TRISAFE-S – master module

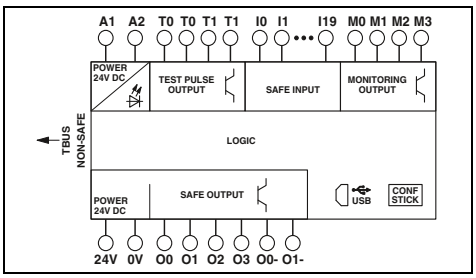
- Freely configurable safety module for monitoring emergency stop, safety doors, light grids, etc.
- With 20 safe inputs, 4 safe outputs, 4 alarm outputs, and 2 clock outputs on a design width of just 67.5 mm
- Easily graphically configurable with the SAFECONF software
- Quick commissioning by means of comprehensive simulation and test functions
- Option for connecting fieldbus gateways for diagnostics and signaling functions
- Including IFS-CONFSTICK memory stick for easy storage and backup of the configuration
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061

Notes:
The necessary SAFECONF configuration software can be downloaded free of charge from phoenixcontact.com.
Further information on the SAFECONF configuration software can be found on page 304
Further information on fieldbus gateways can be found in the “Motor management” section of Catalog 5 or at phoenixcontact.net/products.

PL EN ISO 13849

SILCL IEC 62061

Configurable safety module, cannot be extended



Technical data

Module data		
Nominal input voltage U_N		24 V DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		110 mA
Max. response time		< 30 ms
Interfaces		USB
Input data		
Number of safe inputs		20
Nominal voltage		24 V DC
Output data		
Safe semiconductor outputs		4 (Cat.4 / ISO 13849)
Nominal voltage		24 V DC
Limiting continuous current		2 A (see derating curve)
Ground switching outputs		2
Clock outputs		2
Alarm outputs		4
General data		
Ambient temperature range		-20 °C ... 55 °C
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Spring-cage connection (solid/stranded/AWG)		0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16
Dimensions	Screw version	67.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	67.5 mm / 112 mm / 114.5 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Freely configurable safety module, for monitoring emergency stop, safety doors, light grids, etc., with 20 safe inputs and 4 safe outputs, 4 signaling and 2 cycle outputs			
with screw connection	**PSR-SCP- 24DC/TS/S**	2986229	1
with spring-cage connection	**PSR-SPP- 24DC/TS/S**	2986232	1

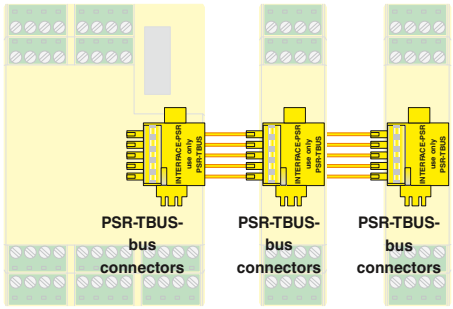
Accessories

Configuration software (single license) for the PSR-TRISAFE system	**SAFECONF**	2986119	1
Copy and delete station, for IFS-CONFSTICK memory modules for copying data from a master stick to up to four slave sticks, connection via USB/mini USB cable	**COPYSTATION - IFS**	2901985	1
Starter kit for the PSR-TRISAFE safety module, consists of PSR-TRISAFE demo board (with inputs and outputs), SAFECONF software, USB connecting cable (3 m), power supply	**PSR-TRISAFE STARTER KIT**	2986300	1
Multi-functional memory block for the Interface system	**IFS-CONFSTICK**	2986122	1
PSR-TBUS DIN rail connector, for supplying/controlling/monitoring (depending on the module)	**PSR-TBUS**	2890425	50

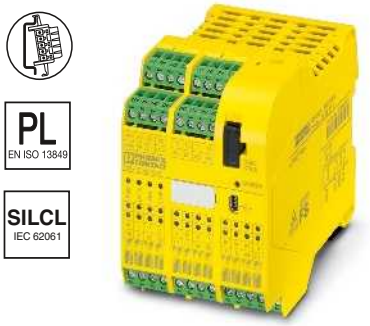
TRISAFE-M – master module that can be safely extended

- Freely configurable safety module for monitoring emergency stop, safety doors, light grids, etc.
- Safe and standard extension via INTERFACE DIN rail TBUS
- With 20 safe inputs, 4 safe outputs, 4 alarm outputs, and 2 clock outputs on a design width of just 67.5 mm
- Easily graphically configurable with the SAFECONF software
- Option for connecting fieldbus gateways for diagnostics and signaling functions
- Including IFS-CONFSTICK memory stick for easy storage and backup of the configuration
- Including PSR-TBUS DIN rail connector for adapting safe extension modules
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061

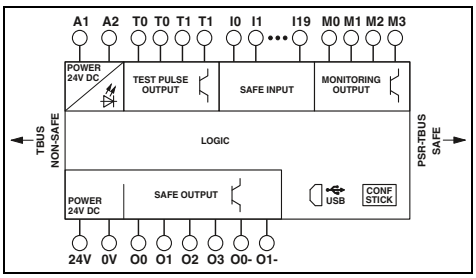
Notes:
For extension modules for PSR-TRISAFE modular, see from page 294
The necessary SAFECONF configuration software can be downloaded free of charge from phoenixcontact.com.
Further information on the SAFECONF configuration software can be found on page 304
Further information on fieldbus gateways can be found in the “Motor management” section of Catalog 5 or at phoenixcontact.net/products.



PSR-TBUS DIN rail connectors are used for cross-wiring between the modules.



Configurable safety module, can be extended



Technical data

Module data		
Nominal input voltage U_N		24 V DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		110 mA
Max. response time		< 30 ms
Interfaces		USB
Input data		
Number of safe inputs		20
Nominal voltage		24 V DC
Output data		
Safe semiconductor outputs		4 (Cat.4 / ISO 13849)
Nominal voltage		24 V DC
Limiting continuous current		2 A (see derating curve)
Ground switching outputs		2
Clock outputs		2
Alarm outputs		4
General data		
Ambient temperature range		-20 °C ... 55 °C
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Spring-cage connection (solid/stranded/AWG)		0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16
Dimensions	Screw version	67.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	67.5 mm / 112 mm / 114.5 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Freely configurable master module, for monitoring emergency stops, safety doors, light grids, etc., with 20 safe inputs and 4 safe outputs, 4 alarm outputs and 2 clock outputs, safe and standard extension, including memory stick and PSR-TBUS DIN rail connector			
with screw connection	**PSR-SCP- 24DC/TS/M**	2986012	1
with spring-cage connection	**PSR-SPP- 24DC/TS/M**	2986025	1

Accessories

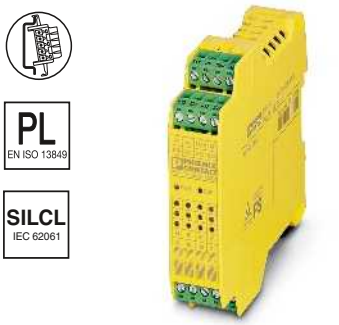
Configuration software (single license) for the PSR-TRISAFE system	**SAFECONF**	2986119	1
Copy and delete station, for IFS-CONFSTICK memory modules for copying data from a master stick to up to four slave sticks, connection via USB/mini USB cable	**COPYSTATION - IFS**	2901985	1
Starter kit for the PSR-TRISAFE safety module, consists of PSR-TRISAFE demo board (with inputs and outputs), SAFECONF software, USB connecting cable (3 m), power supply	**PSR-TRISAFE STARTER KIT**	2986300	1
Multi-functional memory block for the Interface system	**IFS-CONFSTICK**	2986122	1
PSR-TBUS DIN rail connector, for supplying/controlling/monitoring (depending on the module)	**PSR-TBUS**	2890425	50

TRISAFE – extension modules

- I/O extension for PSR-TRISAFE-M
- Slim 22.5 mm housing
- Including PSR-TBUS DIN rail connector for adapting to the PSR-TRISAFE-M master module
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC EN 62061

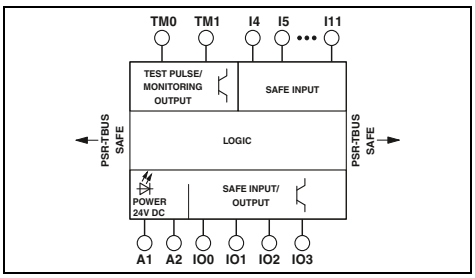
Notes:

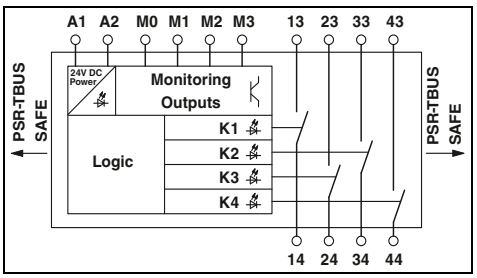
For PSR-TRISAFE-M master module, see page 293



8 safe inputs, plus 4 safe inputs or outputs

4 safe relay outputs (1-channel) or 2 safe relay outputs (2-channel)





Technical data

Module data			
Nominal input voltage U_N		24 V DC (A1 / A2)	24 V DC (via PSR-TBUS)
Permissible range (with reference to U_N)		0.85 ... 1.1	0.85 ... 1.1
Typ. current consumption (with reference to U_N)		100 mA	120 mA
Max. response time		< 30 ms	-
Input data			
Number of safe inputs		12 (of which 4 can be configured as input or output)	-
Nominal voltage		24 V DC	-
Output data			
Safe semiconductor outputs		4 (If the four parameterizable inputs/outputs are used as outputs)	-
Nominal voltage		24 V DC	-
Limiting continuous current		4x 0.5 A (see derating curve)	-
Contact type		-	4 enabling current paths
Contact material		-	AgCuNi, + 0.2 µm Au
Max./min. switching voltage		-	250 V AC / 5 V AC/DC
Limiting continuous current		-	4 A (see derating curve)
Max./min. inrush current		-	6 A / 5 mA
Min. switching power		-	60 mW
Short-circuit protection of the output circuits		-	6 A gL/gG
Response time		-	max. 50 ms
Cycle/alarm outputs		2	-
Alarm outputs		-	4
General data			
Ambient temperature range		-20 °C ... 55 °C	-20 °C ... 55 °C
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Spring-cage connection (solid/stranded/AWG)		0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16	0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16
Dimensions	Screw version	22.5 mm / 99 mm / 114.5 mm	22.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	22.5 mm / 112 mm / 114.5 mm	22.5 mm / 112 mm / 114.5 mm
EMC note		Class A product, see page 525	Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Extension module			
with screw connection	**PSR-SCP- 24DC/TS/SDI8/SDIO4**	2986038	1
with spring-cage connection	**PSR-SPP- 24DC/TS/SDI8/SDIO4**	2986041	1

Accessories

PSR-TBUS DIN rail connector, for supplying/controlling/monitoring (depending on the module)	**PSR-TBUS**	2890425	50

Ordering data

Type	Order No.	Pcs./Pkt.
PSR-SCP- 24DC/TS/SDOR4/4X1	2986096	1
PSR-SPP- 24DC/TS/SDOR4/4X1	2986106	1

Accessories

Type	Order No.	Pcs./Pkt.
PSR-TBUS	2890425	50

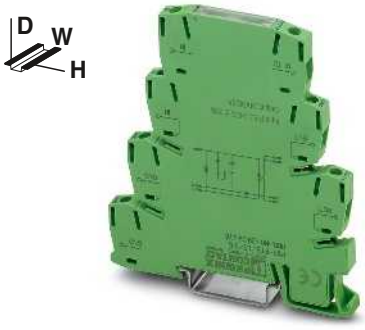
PLC series
Terminal block with integrated test pulse and EMC filter

The **PSR-FTB** filter terminal block is used in the event of problems with 24 V signals affected by EMI and test-pulse-sensitive loads.

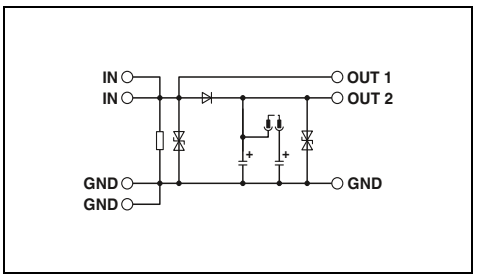
– Filtering of test-pulse-safe electronic outputs
– EMC filter for constant 24 V signals
– Easy wiring using Push-in connection technology

Notes:

The selection of the filter terminal block depends on several parameters (load resistance/current, voltage drop, accepted shutdown time). The parameters can be determined with the aid of more detailed documentation, see phoenixcontact.net/products.



For low loads up to a maximum of 65 mA



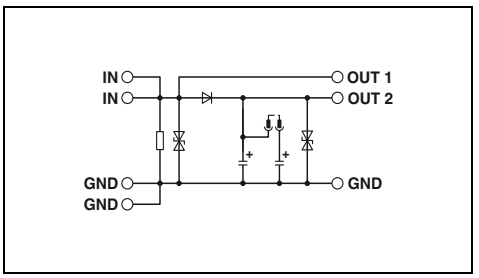
Technical data

Input data		
Nominal input voltage U_N		24 V DC ±20 % (Control voltage U_{ST} right/left)
Typ. input current at U_N		max. 15 mA
Protective circuit		Surge protection
General data		
Ambient temperature range		-25 °C ... 55 °C
Air and creepage distances between the circuits		EN 61131
Rated surge voltage/insulation		1.5 kV / Basic insulation
Push-in connection solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 26
Dimensions	W / H / D	6.2 mm / 94 mm / 80 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
PLC filter terminal block, with integrated test pulse and EMC filter	**PSR-FTB/1.5/11.5**	2904476	1

For high loads up to a maximum of 530 mA



Technical data

Input data		
Nominal input voltage U_N		24 V DC ±20 % (Control voltage U_{ST} right/left)
Typ. input current at U_N		max. 20 mA
Protective circuit		Surge protection
General data		
Ambient temperature range		-25 °C ... 55 °C
Air and creepage distances between the circuits		EN 61131
Rated surge voltage/insulation		1.5 kV / Basic insulation
Push-in connection solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 26
Dimensions	W / H / D	6.2 mm / 94 mm / 80 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
PLC filter terminal block, with integrated test pulse and EMC filter	**PSR-FTB/20/86**	2904477	1

Logic modules

The IB IL 24 LPSDO 8 V3-PAC logic module extends the possible field of application of the system significantly. In addition to the 16 possible connections for remote safe I/O modules, it also supports direct communication between the logic modules.

Features:

– Generation and monitoring of the SafetyBridge protocol
– Processing of the parameterized safety logic
– Control of 8 safe outputs onboard

Notes:

Further information on the SAFECONF configuration software can be found on page 304

Connection to max. 5 safe input/output modules

Connection to max. 16 safe input/output modules

		Technical data	Technical data
Local bus interface			
Connection method		Inline data jumper	Inline data jumper
Transmission speed		500 kbps / 2 Mbps (can be switched)	500 kbps / 2 Mbps (can be switched)
Power supply for module electronics			
Supply voltage		24 V DC (via voltage jumper)	24 V DC (via voltage jumper)
Supply voltage range		19.2 V DC ... 30 V DC	19.2 V DC ... 30 V DC
Digital outputs			
Connection method		2, 3, 4-wire	2, 3, 4-wire
Number of outputs		4 (with two-channel assignment) 8 (for single-channel assignment)	4 (with two-channel assignment) 8 (for single-channel assignment)
Maximum output current per channel		2 A	2 A
Protective circuit		Overload protection, short-circuit protection of outputs	Overload protection, short-circuit protection of outputs
SafetyBridge properties			
Connection to I/O modules		max. 5 (safe digital I/O modules)	max. 16 (safe digital I/O modules)
Logic memory		24 kbyte	60 kbyte
General data			
Connection method		Spring-cage connection	Spring-cage connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Dimensions	W / H / D	48.8 mm / 119.8 mm / 71.5 mm	48.8 mm / 119.8 mm / 71.5 mm
Ambient temperature (operation)		-25 °C ... 55 °C	-25 °C ... 55 °C
EMC note		Class A product, see page 525	Class A product, see page 525

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Safety-related digital logic module						
	IB IL 24 LPSDO 8 V2-PAC	2700606	1	**IB IL 24 LPSDO 8 V3-PAC**	2701625	1
	Accessories			**Accessories**		
Plug set, consisting of four Inline plugs with integrated discharge electronics	**IB IL 24 PSDO 8-PLSET/CP/R**	2700722	1	**IB IL 24 PSDO 8-PLSET/CP/R**	2700722	1
Configuration software for SafetyBridge and PSR-TRISAFE modules, can be downloaded free of charge at phoenixcontact.net/products	**SAFECONF**	2986119	1	**SAFECONF**	2986119	1
Starter kit, including ILC 130 ETH, LPSDO and PSDI SafetyBridge modules, control panel, power supply, plus accessories with preconfigured safety application	**ILC 130 SBT V2 STARTERKIT**	2700993	1			
Zack marker strip, flat (see Catalog 3)	**ZBF 6...**			**ZBF 6...**		

Safe I/Os for Inline

The safe input modules can be used universally. The modules can be used in INTERBUS-Safety systems, PROFIsafe systems via PROFIBUS or PROFINET, and SafetyBridge systems.

Within the relevant safety system, safety functions can be implemented in accordance with the following requirements:
– Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508

Notes:
Further information on the SAFECONF configuration software can be found on page 304

Digital input module, 16 inputs

Digital input module, 8 inputs

		Technical data	Technical data
Local bus interface			
Connection method		Inline data jumper	Inline data jumper
Transmission speed		500 kbps / 2 Mbps (can be switched)	500 kbps / 2 Mbps (can be switched)
Power supply for module electronics			
Supply voltage		24 V DC (via voltage jumper)	24 V DC (via voltage jumper)
Supply voltage range		19.2 V DC ... 30 V DC	19.2 V DC ... 30 V DC
Digital inputs			
Connection method		2, 3-wire	2, 3, 4-wire
Number of inputs		8 (with two-channel assignment) 16 (for single-channel assignment)	4 (with two-channel assignment) 8 (for single-channel assignment)
General data			
Dimensions	W / H / D	48.8 mm / 141 mm / 71.5 mm	48.8 mm / 119.8 mm / 71.5 mm
Ambient temperature (operation)		-25 °C ... 55 °C	-25 °C ... 55 °C
EMC note		Class A product, see page 525	Class A product, see page 525

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Fail-safe digital input module						
	IB IL 24 PSDI 16-PAC	2700994	1	**IB IL 24 PSDI 8-PAC**	2985688	1
	Accessories			**Accessories**		
Plug set, consisting of four Inline plugs with integrated discharge electronics				**IB IL 24 PSDI 8-PLSET/CP/R**	2700720	1
Zack marker strip, flat (see Catalog 3)	**ZBF 6...**			**ZBF 6...**		

Safe I/Os for Inline

The safe I/O modules can be used universally. The modules can be used in INTERBUS-Safety systems, PROFIsafe systems via PROFIBUS or PROFINET, and SafetyBridge systems.

The product range comprises safe input modules, output modules positive and positive/negative-switching, floating switching output modules with integrated relay contacts, as well as an Inline ECO safety module with two sensor circuits for safety-related shutdown of the segment voltage.

An Inline station can be made up of safe and standard modules here, whereby a variety of function terminals are available to the user. The station is configured with high granularity with digital and analog inputs or outputs.

Within the relevant safety system, safety functions can be implemented in accordance with the following requirements:

– Up to Cat. 4/PL e according to EN ISO 13849-1,
SILCL 3 according to IEC 62061,
SIL 3 according to IEC 61508

Notes:

Further information on the SAFECONF configuration software can be found on page 304

Digital output module

Technical data

Local bus interface		
Connection method		Inline data jumper
Transmission speed		500 kbps / 2 Mbps (can be switched)
Power supply for module electronics		
Supply voltage		24 V DC (via voltage jumper)
Supply voltage range		19.2 V DC ... 30 V DC
Digital inputs		
Number of inputs		-
Digital outputs		
Connection method		2, 3-wire
Number of outputs		4 (with two-channel assignment) 8 (for single-channel assignment)
Maximum output current per channel		2 A
Protective circuit		Overload protection, short-circuit protection of outputs
Relay outputs		
Number of outputs		-
Limiting continuous current		-
Switching current		-
Switching capacity		-
General data		
Dimensions	W / H / D	48.8 mm / 119.8 mm / 71.5 mm
Ambient temperature (operation)		-25 °C ... 55 °C
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Fail-safe digital output module - 8 outputs - 4 outputs, +/- switching	**IB IL 24 PSDO 8-PAC**	2985631	1
Fail-safe relay output module - 4 outputs			
Inline ECO safety module			

Accessories

Plug set, consisting of four Inline plugs with integrated discharge electronics	**IB IL 24 PSDO 8-PLSET/CP/R**	2700722	1
Zack marker strip, flat (see Catalog 3)	**ZBF 6...**		

new

Digital output module, +/- wired

Relay output module

Inline ECO safety module with two sensor circuits

Technical data

Inline data jumper	
500 kbps / 2 Mbps (can be switched)	
24 V DC (via voltage jumper)	
19.2 V DC ... 30 V DC	
-	
2, 3-wire	
4 (for two-channel assignment, +/- switching)	
4 (for single-channel assignment, + switching)	
2 A	
Overload protection, short-circuit protection of outputs	
-	
-	
-	
-	
48.8 mm / 119.8 mm / 71.5 mm	
-25 °C ... 55 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 PSDO 4/4-PAC	**2916493**	1

Accessories

IB IL 24 PSDO 4/4-PLSET/CP/R	**2700721**	1

ZBF 6...

Technical data

Inline data jumper	
500 kbps / 2 Mbps (can be switched)	
24 V DC (via voltage jumper)	
19.2 V DC ... 30 V DC	
-	
-	
-	
-	
-	
-	
4 (safety relays with 2 floating contacts each)	
4 A	
min. 5 mA max. 4 A	
min. 60 mW	
73.2 mm / 119.8 mm / 71.5 mm	
-25 °C ... 55 °C	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL 24 PSDOR 4-PAC	**2985864**	1

Accessories

ZBF 6...

Technical data

Inline data jumper	
500 kbps	
24 V DC (via voltage jumper)	
19.2 V DC ... 30 V DC	
4 (for 2 sensor circuits (1- or 2-channel, non-equivalent/equivalent))	
-	
-	
-	
-	
-	
1 (internal, two-channel enabling current path)	
6 A (observe derating)	
min. 3 mA max. 6 A (30 V DC)	
min. 60 mW	
24.4 mm / 119.8 mm / 71.5 mm	
0 °C ... 55 °C (observe derating)	

Ordering data

Type	Order No.	Pcs./Pkt.
IB IL SAFE 2-ECO	**2702446**	1

Accessories

Logic module

The safety module is an output module from the Axioline F product range with integrated safety logic for use in a SafetyBridge Technology V3 system.

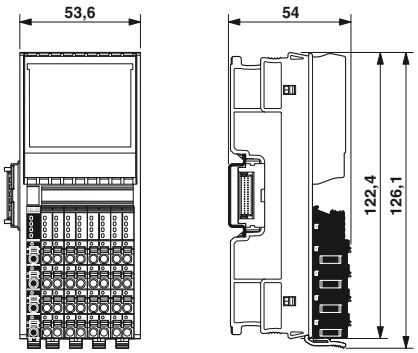
The logic module can be used as part of an Axioline F station at any point within an EtherCAT®, EtherNet/IP™, Sercos, Modbus, PROFINET or PROFIBUS system.

Features:

– Generation and monitoring of the SafetyBridge protocol
– Processing of the parameterized safety logic
– Control of 8 safe outputs onboard

Depending on the installation and parameterization, you can achieve the following safety characteristics with this module:

– Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508



PL
EN ISO 13849

SILCL
IEC 62061

Connection to max. 16 safe input/output modules

Technical data

Local bus interface		
Designation		Axioline F local bus
Connection method		Bus base module
Power supply for module electronics		
Communications power U_{Bus}		5 V DC (via bus base module)
Current consumption from U_{Bus}		typ. 260 mA (all outputs set; power supply by U_O of 19.2 V DC to 30.2 V DC)
I/O supply		
Supply of digital output modules U_O		24 V DC
Supply voltage range U_O		19.2 V DC ... 30.2 V DC (including all tolerances, including ripple)
Current consumption from U_O		typ. 25 mA (all outputs set; power supply by U_O with 30.2 V DC; without power supply to the actuator)
Protective circuit		Protection against polarity reversal, EMC protective circuit, undervoltage detection
Digital outputs		
Connection method		2, 3-wire
Number of outputs		4 (with two-channel assignment) 8 (for single-channel assignment)
Output current		max. 2 A (per channel)
Maximum output current per module / terminal block		8 A
Protective circuit		Overload protection, freewheeling circuit for inductive loads, Discharge circuit for accelerated discharge of capacitive loads
SafetyBridge properties		
Connection to I/O modules		max. 16 (safe digital I/O modules)
Logic memory		30 kbyte
General data		
Connection method		Push-in connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight		220 g
Dimensions	W / H / D	53.6 mm / 126.1 mm / 54 mm
Ambient temperature (operation)		-35 °C ... 60 °C (Mounting position: any)

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Safety-related digital logic module - Connection to a maximum of 16 safe I/O modules	**AXL F LPSDO8/3 1F**	2702171	1

Safe I/Os for Axioline F

You can install the safety-related Axioline F SafetyBridge I/O modules anywhere inside an Axioline F station. In addition to standard signals, this means you can now also read and output safe signals in the Axioline F system.

Depending on the installation and parameterization, you can achieve the following safety characteristics with these modules:

– Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508

Digital input module

Digital output module

		Technical data	Technical data
Local bus interface			
Designation		Axioline F local bus	Axioline F local bus
Connection method		Bus base module	Bus base module
Power supply for module electronics			
Communications power U_{Bus}		5 V DC (via bus base module)	5 V DC (via bus base module)
Current consumption from U_{Bus}		typ. 280 mA (all inputs set; power supply by U_I of 19.2 V DC to 30.2 V DC)	typ. 260 mA (all outputs set; power supply by U_O of 19.2 V DC to 30.2 V DC)
I/O supply			
Supply of digital input modules U_I		24 V DC	-
Supply voltage range U_I		19.2 V DC ... 30.2 V DC (including all tolerances, including ripple)	-
Current consumption from U_I		typ. 9 mA (all inputs set; power supply by U_I with 30.2 V DC; without power supply to the sensors via clock supplies T1 and T2)	-
Supply of digital output modules U_O		-	24 V DC
Supply voltage range U_O		-	19.2 V DC ... 30.2 V DC (including all tolerances, including ripple)
Current consumption from U_O		-	typ. 25 mA (all outputs set; power supply by U_O with 30.2 V DC; without power supply to the actuator)
Protective circuit		Protection against polarity reversal, EMC protective circuit, undervoltage detection	Protection against polarity reversal, EMC protective circuit, undervoltage detection
Digital inputs			
Connection method		2, 3, 4-wire	-
Number of inputs		4 (with two-channel assignment)	-
		8 (for single-channel assignment)	-
Description of the inputs		IEC 61131-2 type 3	-
Nominal input voltage U_{IN}		24 V DC	-
Nominal input current at U_{IN}		typ. 4.2 mA	-
Input filter time		1.5 ms / 3 ms (default) / 5 ms / 15 ms	-
Digital outputs			
Connection method		-	2, 3-wire
Number of outputs		-	4 (with two-channel assignment)
		-	8 (for single-channel assignment)
Output voltage		-	24 V DC
Output current		-	max. 2 A (per channel)
Maximum output current per module / terminal block		-	8 A
Behavior with overload		-	Affected output is disabled and a diagnostic message is generated.
Protective circuit		-	Overload protection, freewheeling circuit for inductive loads, Discharge circuit for accelerated discharge of capacitive loads
General data			
Connection method		Push-in connection	Push-in connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight		220 g	220 g
Dimensions	W / H / D	53.6 mm / 126.1 mm / 54 mm	53.6 mm / 126.1 mm / 54 mm
Ambient temperature (operation)		-35 °C ... 60 °C (Mounting position: any)	-35 °C ... 60 °C (Mounting position: any)

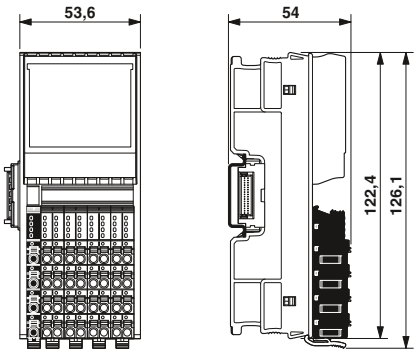
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Fail-safe digital input module						
	AXL F SSDI8/4 1F	2702263	1			
Fail-safe digital output module						
				AXL F SSDO8/3 1F	2702264	1

Safe I/Os for Axioline F

You can install the safety-related Axioline F PROFIsafe I/O modules anywhere inside an Axioline station. In addition to standard signals, this means you can now also read and output safe signals in the Axioline system.

Depending on the installation and parameterization, you can achieve the following safety characteristics with these modules:

– Up to Cat. 4/PL e according to EN ISO 13849-1,
SILCL 3 according to IEC 62061,
SIL 3 according to IEC 61508



Digital input module

Technical data

Local bus interface		
Designation		Axioline F local bus
Connection method		Bus base module
Power supply for module electronics		
Communications power U_{Bus}		5 V DC (via bus base module)
Current consumption from U_{Bus}		typ. 280 mA (all inputs set; power supply by U_l of 19.2 V DC to 30.2 V DC)
I/O supply		
Supply of digital input modules U_l		24 V DC
Supply voltage range U_l		19.2 V DC ... 30.2 V DC (including all tolerances, including ripple)
Current consumption from U_l		typ. 9 mA (all inputs set; power supply by U_l with 30.2 V DC; without power supply to the sensors via clock supplies T1 and T2)
Protective circuit		Protection against polarity reversal, EMC protective circuit, undervoltage detection
Digital inputs		
Connection method		2, 3, 4-wire
Number of inputs		4 (with two-channel assignment) 8 (for single-channel assignment)
Description of the inputs		IEC 61131-2 type 3
Nominal input voltage U_{IN}		24 V DC
Nominal input current at U_{IN}		typ. 4.2 mA
Input filter time		1.5 ms / 3 ms (default) / 5 ms / 15 ms
General data		
Connection method		Push-in connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight		220 g
Dimensions	W / H / D	53.6 mm / 126.1 mm / 54 mm
Ambient temperature (operation)		-35 °C ... 60 °C (Mounting position: any)

Ordering data

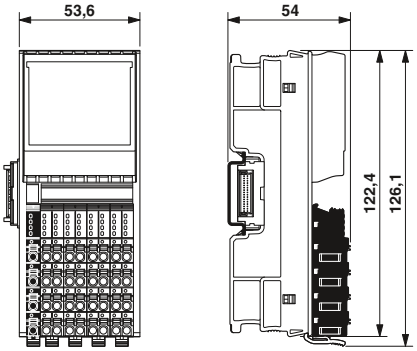
Description	Type	Order No.	Pcs./Pkt.
Fail-safe digital input module			
- 4 inputs (two-channel), 8 inputs (single-channel)	**AXL F PSDI8/4 1F**	2701559	1

Safe I/Os for Axioline F

You can install the safety-related Axioline F PROFIsafe I/O modules anywhere inside an Axioline station. In addition to standard signals, this means you can now also read and output safe signals in the Axioline system.

Depending on the installation and parameterization, you can achieve the following safety characteristics with these modules:

– Up to Cat. 4/PL e according to EN ISO 13849-1,
SILCL 3 according to IEC 62061,
SIL 3 according to IEC 61508



Digital output module

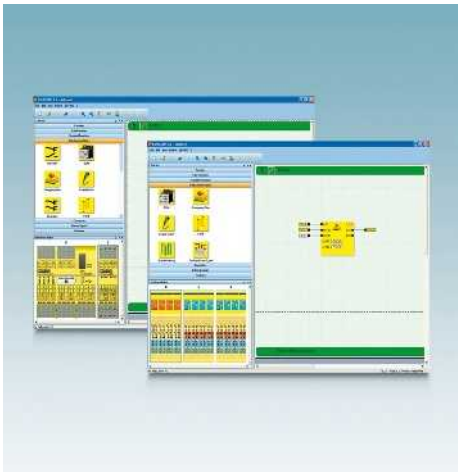
Technical data

Local bus interface		
Designation		Axioline F local bus
Connection method		Bus base module
Power supply for module electronics		
Communications power U_{Bus}		5 V DC (via bus base module)
Current consumption from U_{Bus}		typ. 260 mA (all outputs set; power supply by U_O of 19.2 V DC to 30.2 V DC)
I/O supply		
Supply of digital output modules U_O		24 V DC
Supply voltage range U_O		19.2 V DC ... 30.2 V DC (including all tolerances, including ripple)
Current consumption from U_O		typ. 25 mA (all outputs set; power supply by U_O with 30.2 V DC; without power supply to the actuator)
Protective circuit		Protection against polarity reversal, EMC protective circuit, undervoltage detection
Digital outputs		
Connection method		2, 3-wire
Number of outputs		4 (with two-channel assignment) 8 (for single-channel assignment)
Output voltage		24 V DC
Output current		max. 2 A (per channel)
Maximum output current per module / terminal block		8 A
Behavior with overload		Affected output is disabled and a diagnostic message is generated.
Protective circuit		Overload protection, freewheeling circuit for inductive loads, Discharge circuit for accelerated discharge of capacitive loads
General data		
Connection method		Push-in connection
Connection data solid/stranded/AWG		0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight		220 g
Dimensions	W / H / D	53.6 mm / 126.1 mm / 54 mm
Ambient temperature (operation)		-35 °C ... 60 °C (Mounting position: any)

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Fail-safe digital output module			
- 4 outputs (two-channel), 8 outputs (single-channel)	**AXL F PSDO8/3 1F**	2701560	1

SAFECONF – configuration software



Configuration software for PSR-TRISAFE and SafetyBridge modules

The software implements the consistent configuration of the safety function and the parameterization of the safe SafetyBridge and PSR-TRISAFE modules.

Instead of being programmed, the required functions and components are simply dragged to the connection editor, where they can be linked. It takes just three steps to create a project, test it, and transfer it to the safety module.

When using SafetyBridge modules, you can create the safe configuration independently of the controller and automation network used.

Technical data

Hardware requirements	
Processor	Pentium, 2 GHz (recommended), 1 GHz (min.)
Main memory (RAM)	2 Gbyte (Under Unter Windows 7 / Windows 8: 1 Gbyte (min.) Under Windows XP 512 Mbytes (min.))
Hard disk memory	min. 250 Mbyte (Free hard disk memory space)
Optical drive	CD-ROM
Operating equipment	Keyboard, mouse
Monitor resolution	800x600
Software requirements	
Operating systems	Windows® 7 Professional SP1 (32-bit/64-bit) / Windows® 8 (32 bit/64 bit) / MS Windows XP (SP3) Multi-Language
Supported browsers	Internet Explorer 6 or higher
Basic functions	
	Configuration software for PSR-TRISAFE and SafetyBridge technology
Languages supported	
	German, English, French, Spanish, Italian

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Configuration software for SafetyBridge and PSR-TRISAFE modules, can be downloaded free of charge at phoenixcontact.net/products	**SAFECONF**	2986119	1

PSR-CONF-WIN – configuration software

The PSR-CONF-WIN configuration package is used to parameterize the PSR-RSM4 safe zero-speed and over-speed safety relay.

Application-related safety parameters such as downtime and speed limits can be set in the software. The data is then transferred to the safety relay module.

Configuration software and connecting cable

EAC

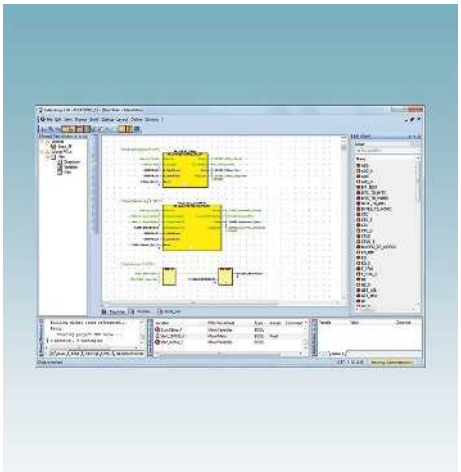
Technical data

Hardware requirements	
Processor	Pentium, 2 GHz (recommended), 1 GHz (min.)
Main memory (RAM)	1 Gbyte (under Windows 7/under Windows XP: 512 Mbytes (min.))
Hard disk memory	min. 250 Mbyte (Free hard disk memory space)
Optical drive	CD-ROM
Operating equipment	Keyboard, mouse
Monitor resolution	800x600
Software requirements	
Operating systems	Windows® 7 (32-bit/64-bit) / Windows XP / MS Windows NT 4.0 with Service Pack > 4, MS Windows 2000 and MS Windows XP
Basic functions	
	Configuration software for PSR-RSM4 safe zero-speed and over-speed safety relay
Expanded functionality	
Languages supported	
	German, English, French, Spanish, Italian

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Configuration software for parameterizing the PSR-RSM4 safe zero-speed and over-speed safety relay, with programming cable	**PSR-CONF-WIN1.0**	2981554	1

SAFETYPROG – programming software



SafetyProg can be used to develop safe applications with safety controllers - using PROFIsafe networks.

The TÜV-certified programming tool guides you through the various development phases of a safety application:

– IEC 61131-compliant programming in function block diagram (FBD), ladder diagram (LD), and structured text (ST)
– Compiling the project
– Sending the project to the safety controller
– Controlling the safety controller, e.g., start, stop or reset
– Performing function tests
– Monitoring the safety controller and debugging the safety application
– Project documentation
– Printing project documentation

SAFETYPROG contains a comprehensive library with 20 certified function blocks for safety technology, all in accordance with PLCopen safety specification 1.0.

Useful tools

SAFETYPROG offers many innovative tools, which enable you to integrate Functional Safety in your automation system:

– User management
– Bus configuration project for importing process and diagnostic data
– Bus navigator
– Code editor and Edit wizard
– Coupling of safe and standard PLC
– Project tree
– Cross-reference and message windows
– Controller simulation
– Variable editor

Notes:

Further information on the safe PROFIsafe controller can be found on page 309

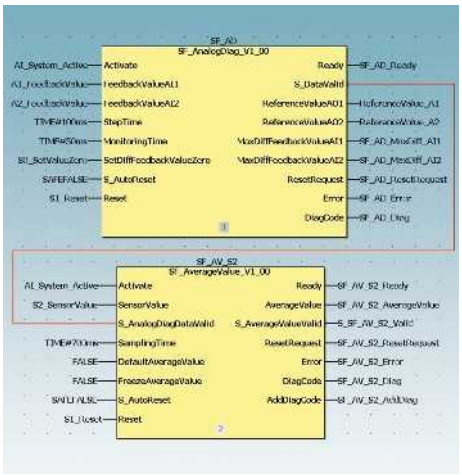
Programming software for PROFIsafe controllers

Functional Safety

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Programming software for PROFIsafe controllers, with graphical user interface according to IEC 61131-3 in function block diagram (FBD) and ladder diagram (LD). **One library** from the corresponding **PLCopen libraries** can be used per project.	**SAFETYPROG BASIC**	2700443	1
Programming software for PROFIsafe controllers, with graphical user interface according to IEC 61131-3 in function block diagram (FBD) and ladder diagram (LD). **Three of the libraries** from the corresponding **PLCopen libraries** can be used per project.	**SAFETYPROG ADVANCED**	2700441	1
Programming software for PROFIsafe controllers, with graphical user interface according to IEC 61131-3 in function block diagram (FBD) and ladder diagram (LD). **All of the libraries** from the corresponding **PLCopen libraries** can be used per project.	**SAFETYPROG PROFESSIONAL**	2700442	1

Safe analog value processing



Function block library for safety-related analog value acquisition with standard I/O modules.

Please contact the safety hotline before ordering **SAFE AI**.

24-hour safety hotline
+49 5281 9-462777
safety-service@phoenixcontact.com

Wherever analog values need to be processed in a safety-related manner, the Safe AI solution package from Phoenix Contact is the ideal solution. With this TÜV-certified and software-based analog value processing, no safety-related I/O modules are required. This saves you money and offers flexibility.

Components of the Safe AI solution package:
– Initial application advice via telephone on the required software and hardware components
– License key for using the ANALOGINPUT_SF function block library including user documentation
– Advice from the Competence Center Safety in the form of a web meeting

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Function block library for safety-related analog acquisition with standard I/O modules	**SAFE AI**	2400057	1

Safe PROFINET gateway

The safe PROFINET gateway from Phoenix Contact enables secure communication between two PROFINET networks. This means that you can implement system-wide and manufacturer-independent Functional Safety, such as emergency stop concepts.

Your advantages:
– Coupling of two PROFINET systems
– Transmission of standard I/O data via PROFINET
– Transmission of safe I/O data via PROFIsafe
– Redundant power supply
– Control-independent

Within a PROFIsafe system, the safety functions associated with the following requirements are supported:
– SIL 3 according to IEC 61508
– SILCL 3 according to IEC 61508
– PL e according to EN ISO 13849-1

Safe PROFINET gateway

Technical data

Supply		
Supply voltage		24 V DC
Supply voltage range		18.5 V DC ... 30 V DC (including ripple)
Current consumption		max. 250 mA
Programming data		
IN and OUT process data		128 Byte (2 - 11 bytes of safe IO process data)
General data		
Weight		550 g
Dimensions	W / H / D	130 mm / 27 mm / 145 mm
Ambient temperature (operation)		-25 °C ... 60 °C
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Safe **PROFINET gateway**	**FL PN/PN SDIO-2TX/2TX**	2700651	1

Accessories

Color marking for FL CAT... Patch...			
- Blue	**FL PATCH CCODE BU**	2891291	20
- Red	**FL PATCH CCODE RD**	2891893	20
Lockable security element for FL PATCH...	**FL PATCH GUARD**	2891424	20
Key for FL PATCH GUARD	**FL PATCH GUARD KEY**	2891521	1
Security element for FL CAT ...patch...	**FL PATCH SAFE CLIP**	2891246	20

Safe PROFIsafe controller

The RFC 470S is the safety version of the most powerful high-end PLC and offers all the features of the class 400 high-performance controller. In addition, it has an integrated safety controller. This combination can be used to integrate safety functions up to SIL 3 into existing systems.

Your advantages:
- The use of PROFIsafe reduces wiring effort and installation time
- Thanks to the integrated PROFINET interface, the RFC 470S communicates directly with PROFIsafe modules
- The safety function is programmed using the SAFETYPROG software

Depending on the parameterization of the I/O modules and the programming, the RFC 470S can meet the following requirements:
- SIL 3 according to IEC 61508
- SILCL 3 according to IEC 61508
- PL e according to EN ISO 13849-1

Notes:

Further information on class 400 high-performance controllers can be found in the "Controllers" section of this catalog.

Further information on the SAFETYPROG programming software can be found on page 306

Class 400 compact controller with integrated safety controller

Technical data

Interfaces		
INTERBUS (Master)		1 x D-SUB-9 socket
Ethernet		3 x RJ45 socket
Parameterization/operation/diagnostics		1 x D-SUB 9 connector
INTERBUS master		
Number of devices with parameter channel		max. 126
Number of supported devices		max. 512 (of which 254 are remote bus devices/bus segments)
Amount of process data		max. 8192 bit (INTERBUS)
Digital inputs/outputs		
Connection method		14-pos. FLK pin strip
Number of inputs		5
Number of outputs		3
IEC-61131 runtime system		
Processor		Intel® Celeron® 927 UE 1.5 GHz
Program memory		typ. 8 Mbyte
Mass storage		16 Mbyte
Retentive mass storage		240 kbyte (NVRAM)
Number of data blocks		depends on mass storage
Number of timers, counters		depends on mass storage
Number of control tasks		16
Realtime clock		Integrated (battery backup)
Power supply		
Power supply connection		Screw terminal blocks, plug-in
Supply voltage		24 V DC
Supply voltage range		19.2 V DC ... 30 V DC (including ripple)
Typical current consumption		1 A
General data		
Dimensions	W / H / D	124 mm / 185 mm / 190 mm
Degree of protection		IP20
Ambient temperature (operation)		0 °C ... 55 °C (from 45°C only with fan module)
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Safety controller			
	RFC 470S PN 3TX	2916794	1

Accessories

Parameterization memory			
- 256 MB	**CF FLASH 256MB**	2988780	1
- 2 GB	**CF FLASH 2GB**	2701185	1
Programming cable, to connect the controller boards to the PC (RS-232-C), length 3 m	**IBS PRG CAB**	2806862	1
(RS-232) null modem adapter			
- 9-pos. socket to 9-pos. connector	**PSM-AD-D9-NULLMODEM**	2708753	1
Fan module for Remote Field Controller	**RFC DUAL-FAN**	2730239	1
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers			
- ILC 1x1, AXC 1xxxx, ILC 3xx, AXC 3xxx, RFC 4xx, PC WORX RT BASIC/SRT	**AX OPC SERVER**	2985945	1
SAFETYPROG programming software			
- Basic	**SAFETYPROG BASIC**	2700443	1
- Advanced	**SAFETYPROG ADVANCED**	2700441	1
- Professional	**SAFETYPROG PROFESSIONAL**	2700442	1
Engineering software	**PC WORX ... (see "Software" section)**		

Control solution for functional safety

new

Safety solution for Inline

With the Easy Safe safety solution, in combination with the ILC 151 ETH or AXC 1050 controllers, you can quickly and easily integrate safe I/O modules into your machine. All the necessary configuration settings and initializations for the integration of SafetyBridge I/O modules in your standard application are applied automatically.

Your advantages:

– Easy safety-related programming by means of pre-configured software application
– Quick configuration, thanks to user-friendly web interface
– Comprehensive communication options, thanks to Modbus and PROFINET connection (PRO version)
– Always informed, thanks to notification function via e-mail (PRO version)

Additional features:

– Graphical interface
– Safety logic using drag and drop
– License key and user program

Technical data

Interfaces		
Designation		INTERBUS local bus (master)
Connection method		Inline data jumper
Ethernet		1 x RJ45 socket
Parameterization/operation/diagnostics		1 x 6-pos. MINI DIN socket (PS/2)
System limits		
Number of devices with parameter channel		max. 16
Number of supported devices		max. 128
Amount of process data		max. 4096 bit (INTERBUS) max. 16384 bit (internal Modbus /TCP client)
Digital inputs/outputs		
Number of inputs		8
Number of outputs		4
IEC-61131 runtime system		
Programming tool		PC WORX / PC WORX EXPRESS
Processor		Altera Nios II 64 MHz
Program memory		256 kbyte
Mass storage		256 kbyte
Retentive mass storage		8 kbyte (NVRAM)
Number of data blocks		depends on mass storage
Number of timers, counters		depends on mass storage
Number of control tasks		8
Realtime clock		Yes
Power supply		
Supply voltage		24 V DC
Supply voltage range		19.2 V DC ... 30 V DC
Typical current consumption		210 mA
General data		
Dimensions	W / H / D	80 mm / 119.8 mm / 71.5 mm
Degree of protection		IP20
Ambient temperature (operation)		-25 °C ... 55 °C
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Small-scale controller, complete with accessories (connector and marking field)	**ILC 151 ETH**	2700974	1
Program and configuration memory, Flash card with license key and user program for easy web-based configuration and startup of a SafetyBridge solution			
- 2 GB, for Inline	**SD FLASH 2GB EASY SAFE BASIC**	2403297	1
- 2 GB, for Inline including communication via Modbus/TCP, PROFINET, and e-mail	**SD FLASH 2GB EASY SAFE PRO**	2403298	1
- 2 GB, for Axioline including communication via Modbus/TCP, PROFINET, and e-mail			

new

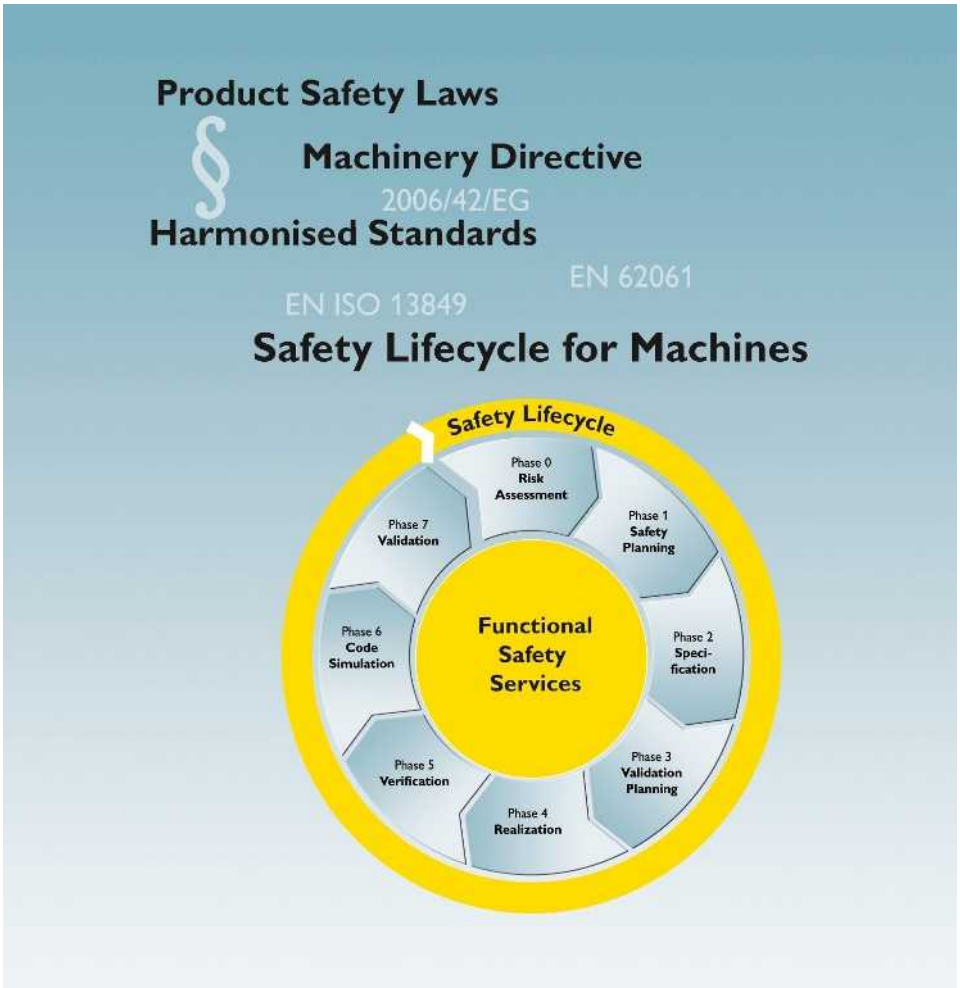
Safety solution for Axioline PRO version

Technical data

Axioline F local bus
Bus base module
2 x RJ45 socket
1 x Micro USB type B
-
max. 63
max. 4096 bit (Axioline F local bus (input))
max. 4096 bit (Axioline F local bus (output))
max. 32768 bit (internal Modbus /TCP client)
-
-
PC WORX / PC WORX EXPRESS
Altera Nios II 100 MHz
1 Mbyte
2 Mbyte
48 kbyte (NVRAM)
depends on mass storage
depends on mass storage
8
Yes
24 V DC
19.2 V DC ... 30 V DC
125 mA
45 mm / 125.9 mm / 74 mm
IP20
-25 °C ... 60 °C
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
AXC 1050	**2700988**	1
SD FLASH 2GB AXC EASY SAFE PRO	**2403730**	1



Safety lifecycle

Based on the harmonized standards of the Machinery Directive, Phoenix Contact has developed a phase model, which represents the safety lifecycle. This structured procedure assists in the application of and conformance with the harmonized standards of the Machinery Directive.

The safety lifecycle represents a specific process for the design and manufacture of machinery, which fully includes the requirements for functional safety. The phase-based templates for verification documentation already contain the required contents to demonstrate CE conformity for safety-related parts of the controller. This is a legal requirement for placing items on the market in the European Economic Area.

Expert support

With our services for functional safety, we focus on the safety lifecycle for machines. This means that as the person responsible, you can be sure that all systematic errors will be considered on your machine and all requirements of standards will be met.

We are on hand to assist you throughout the entire lifecycle of your application: we provide support from the initial risk assessment, drafting the concept, implementation, startup, and operation right up to system modernization.

The choice is yours:

– Appoint one of our safety experts for consultation, facilitation, engineering or service activities
– Ask us to train and qualify your employees

Your advantages from our safety services

– Time saved by transferring safety requirements
– Maximum legal certainty
– Optimum technical safety solution
– Sophisticated process management
– Target-oriented project management
– Traceable, legal protection thanks to consistent documentation

Product support

If queries arise when selecting products or during startup and operation, in addition to your local specialists you can also contact our free 24-hour safety hotline at any time: **+49 (0) 5281 9 46 2777**

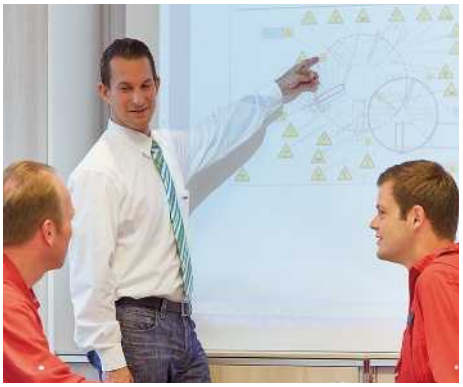
Or send us an e-mail: safety-service@phoenixcontact.com

Safety consulting
Order No. 2700501

Through individual consultations we are here to advise you from the initial planning of your safety-related application right up to startup.

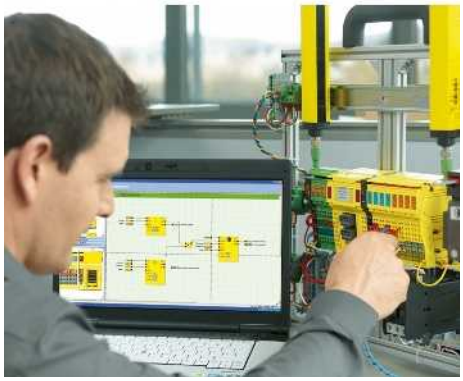
Web consulting
Order No. 9064679

No matter where you are, we can provide advice about machine safety.



Safety presentation
Order No. 2701589

Our experts accompany you on-site through presentations on the safety lifecycle. They explain how to use the documentation templates that we provide for verification documentation. We discuss with you the technical contents for your concrete application.



Safety engineering
Order No. 2700505

Based on your released development documents, we implement functional safety for you:
– Safety concept
– Safety planning
– Hardware and software specification
– SIL/PL verification
– Parameterization/programming
– Code simulation
– Test implementation

Product support

Our safety specialists will answer any questions you have about our safety hardware and software products via our free 24-hour safety hotline.

Furthermore, we can hold product workshops with you, support you on site during startup and servicing, and help you plan your own individual safety concept.

Seminars and workshops

Phoenix Contact offers a wide range of content for seminars as well as different types of seminars on functional safety. Depending on your existing level of knowledge, you can start with the basics, refresh your knowledge or indeed become an expert thanks to our seminars.

If you require specialist knowledge and wish to arrange the training location and schedule yourself, we can create an individual training course for you.

Safety in the process industry

Taking into account legal specifications, regulatory requirements, and management of functional safety, we can help you to keep all the requirements throughout the entire safety equipment lifecycle in mind.
– Consultation
– Facilitation
– Engineering
– SIL assessment
– Seminars
– Integration of machines

PHOENIX CONTACT
TC EXTENDER 2021 ETH-2S
US
DIAG
ACT
LINK
ERR
LAN
DSL A
DSL B
LINK
STAT
TC EXTENDER 6004 ETH-2S
Reset
SD Card
LAN 1
LAN 2
LAN 3
LAN 4
GND DO2 GND DI1
Micro SD
SIM
TC ROUTER

Industrial communication technology

The increasing degree of automation in modern systems and machinery is placing ever growing demands on the performance capabilities of the communication networks used.

The main arteries of these networks consist of various types of serial data connections. They are not compatible with each other nor do they meet the increasing requirements with regard to immunity to interference, bandwidth, and speed.

With our products, you can achieve interference-free and high-performance data transmission, even in harsh industrial environments.

Copper transmission

High-performance isolators, repeaters, and converters are available for all leading networks. The devices excel thanks to their high insulation voltages between the interfaces, which effectively prevent faults and compensating currents.

Fiber optic transmission

Fiber optic data transmission has become the norm, particularly in critical applications with very high requirements regarding availability. Whether immunity to interference, high performance, electrical isolation or network expansion, the use of fiber optic technology is unavoidable.

Remote communication

Global networking of machines and systems. Alarm generation, remote maintenance, and continual data acquisition. From classic analog modems to fast mobile phone routers: the right system for every application.

Wireless data communication

Modern wireless systems are a flexible, extendable, and low-cost alternative. Depending on the distance to be covered and the signals to be transmitted, various wireless technologies are available such as Trusted Wireless, Bluetooth or WLAN.

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Product overview

Copper transmission

Repeaters for electrical isolation and increasing the range

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Termination resistor for active bus termination

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Interface converters

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Device couplers for FOUNDATION Fieldbus and PROFIBUS PA

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Fiber optics transmission

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FO accessories – FO cables, connectors, and tools

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Industrial Ethernet

Universal media converters for conversion to fiber optics

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Media converters for realtime protocols and IEC 61850 environments

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Industrial Ethernet

Switches, interface modules, hubs, Power over Ethernet modules

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Secure networks – routers with firewall for control cabinet and mobile use, PCI

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Remote communication

Alarm generation – remote signaling and remote control system

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Remote maintenance – mGUARD security router

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Remote communication

Remote control – mobile routers

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Protocol converters

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Wireless

Radioline wireless modules, WirelessHART, and accessories

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Bluetooth wireless modules (2.4 GHz) Wireless multiplexer with antennas

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Fiber optics transmission

FO converters for PROFIBUS

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FO converters for DeviceNet™ and CANopen®

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FO converters for
RS-485 2-wire bus systems

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Serial device servers, 1 port,
for conversion to Ethernet

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Serial device servers and protocol converters, multiport, for conversion to Ethernet

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Isolator for electrical isolation

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Passive mini patch panels with various connection options

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Remote maintenance –
Cloud Client

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Remote control and remote maintenance –
DSL broadband router/modem with firewall, VPN, and serial device server

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managed Ethernet extenders

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Fast connection technology

Type A Fast Connect PROFIBUS cable and quick stripping tool

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M12 D-SUB fast connection
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D-SUB fast connection
for PROFIBUS and CANopen®

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D-SUB fast connection for Modbus, INTERBUS, RS-232, RS-422, RS-485

Page 378

Repeaters

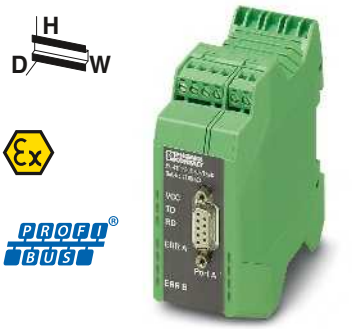
The performance and availability of bus systems can be significantly increased by using repeaters. In addition to electrical isolation, bus segmentation with repeaters makes it possible to multiply the permissible coverage of the network and to extend the number of devices.

The **PSI-REP-PROFIBUS/12MB** modular repeater has been specially developed for the requirements of PROFIBUS systems.
– bit retiming for unrestricted cascading of devices
– Filtering of faulty telegrams based on start delimiter detection
– Routing of supply voltage and data signals through DIN rail connectors

As a modular repeater, the **PSI-REP-RS485W2** can be used in RS-485 2-wire bus systems.
– bit retiming for unrestricted cascading of devices
– Routing of supply voltage and data signals through DIN rail connectors

The **PSM-ME-RS485/RS485-P** compact repeater is designed for universal use in RS-485 2-wire bus systems.
– Transmission speeds of up to 1.5 Mbps
– Space-saving slim 22.5 mm device
– Shipbuilding approval according to DNV

The **PSI-REP-DNET CAN** modular repeater connects every two CAN segments with the same data rate.



Repeater for PROFIBUS, 4-way isolation, supports modular expansion

Ex:

Technical data

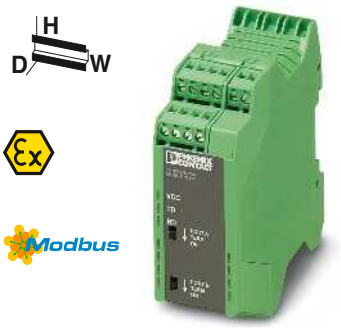
Supply		
Supply voltage		24 V DC (With UL approval)
Supply voltage range		18 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Nominal current consumption		90 mA (24 V DC)
RS-485 interface		PROFIBUS acc. to IEC 61158, RS-485 2-conductor
Data format/coding		UART (11 bit, NRZ)
Data direction switching		Automatic control, min. station response time 2 bits
Termination resistor		external
Transmission speed		9.6/19.2/45.45/93.75/187.5/500/1500/3000/6000/12000 kbps (can be set manually and automatically)
Transmission length		≤ 1200 m (depends on transmission speed and cable type)
Connection method		D-SUB-9 socket
CAN interface		
Termination resistor		-
Transmission speed		-
Transmission length		-
Connection method		-
General data		
bit distortion, input		max. ± 35 %
bit distortion, output		< 6.25 %
bit delay		1 bit (Direct mode)
Alarm output		30 V DC (1 A) / 65 V DC (0.46 A) / 150 V AC (0.46 A)
Test voltage		1.5 kV_{rms} (50 Hz, 1 min.)
Ambient temperature range		-20 °C ... 60 °C
Electrical isolation		VCC // TBUS // PROFIBUS (A) // PROFIBUS (B)
Dimensions	W / H / D	35 mm / 99 mm / 105 mm
EMC note		Class A product, see page 525
Conformance/Approvals		
ATEX		II 3 G Ex nA nC IIC T4 Gc X
UL, USA/Canada		cULus listed UL 508 Class I, Zone 2, AEx nA IIC T6 Class I, Zone 2, Ex nA IIC T6 Gc X Class I, Div. 2, Groups A, B, C, D

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Repeater, for electrical isolation and increased range	**PSI-REP-PROFIBUS/12MB**	2708863	1

Accessories

DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device	**ME 17,5 TBUS 1,5/ 5-ST-3,81 GN**	2709561	10
System power supply, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	2866983	1



Repeater for RS-485 2-wire systems, 4-way isolation, supports modular expansion

Ex:

Technical data

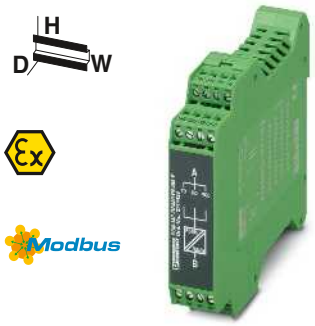
24 V DC (With UL approval)	
18 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	
75 mA (24 V DC)	
RS-485 interface, in acc. with EIA/TIA-485, DIN 66259-4/RS-485 2-wire	
UART (11/10 bit switchable; NRZ)	
Automatic control, min. station response time 2 bits	
390 Ω (Can be connected to port A and B) / 150 Ω / 390 Ω	
4.8/9.6/19.2/38.4/57.6/75/93.75/115.2/136/187.5/375/500 kbps (can be set manually)	
≤ 1200 m (depends on transmission speed, bus system and cable type)	
Plug-in screw connection	
-	
-	
-	
-	
max. ± 35 %	
< 6.25 %	
< 1 bit	
-	
1.5 kV (50 Hz, 1 min.)	
-20 °C ... 60 °C	
VCC // TBUS // RS-485 (A) // RS-485 (B)	
35 mm / 99 mm / 105 mm	
Class A product, see page 525	
II 3 G Ex nA IIC T4 Gc X	
508 recognized	
Class I, Zone 2, AEx nA IIC T6	
Class I, Zone 2, Ex nA IIC T6 Gc X	
Class I, Div. 2, Groups A, B, C, D	

Ordering data

Type	Order No.	Pcs./Pkt.
PSI-REP-RS485W2	**2313096**	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1



Basic repeater for RS-485 2-wire systems, 3-way isolation

Ex:

Technical data

24 V AC/DC	
18 V AC/DC ... 30 V AC/DC (via plug-in COMBICON screw terminal block)	
90 mA (24 V DC)	
RS-485 interface, in acc. with EIA/TIA-485, DIN 66259-4/RS-485 2-wire	
UART (11/10 bit switchable; NRZ)	
Automatic control, min. station response time 1 bits	
390 Ω / 180 Ω / 390 Ω (Can be connected)	
1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 75 / 93.75 / 115.2 / 136 / 187.5 / 375 / 500 / 1500 kbps	
≤ 1200 m (depends on transmission speed, bus system and cable type)	
Plug-in screw connection	
-	
-	
-	
-	
max. ± 35 %	
< 3.6 %	
< 200 ns	
-	
1.5 kV (50 Hz, 1 min.)	
-40 °C ... 70 °C	
VCC // RS-485 (A) // RS-485 (B)	
22.5 mm / 99 mm / 114.5 mm	
Class A product, see page 525	
II 3 G Ex nA IIC T4 Gc	
508 recognized	
Class I, Div. 2, Groups A, B, C, D	
Class I, Zone 2, AEx nA IIC T4	
Class I, Zone 2, Ex nA IIC T4 Gc X	

Ordering data

Type	Order No.	Pcs./Pkt.
PSM-ME-RS485/RS485-P	**2744429**	1

Accessories

Repeater for DeviceNet™ and CANopen®

Technical data

24 V DC	
10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	
55 mA (24 V DC)	
-	
-	
-	
CAN interface, in accordance with ISO/IS 11898 for DeviceNet, CAN, CANopen	
124 Ω (Integrated and ready to be switched)	
≤ 1 Mbps (Configurable via DIP switches)	
≤ 5000 m (Dependent on the data rate and the protocol used)	
COMBICON connector screw terminal block	
± 35 %	
< 6.25 %	
One telegram length (EXTENDED)	
10 V DC ... 30 V DC ; 500 mA	
1.5 kV (50 Hz, 1 min.)	
-20 °C ... 60 °C	
VCC // TBUS // CAN A // CAN B	
35 mm / 111 mm / 121 mm	
Class A product, see page 525	
II 3 G Ex nA IIC T4 Gc X	
508 listed	

Ordering data

Type	Order No.	Pcs./Pkt.
PSI-REP-DNET CAN	**2313423**	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Terminators

The **PSI-TERMINATOR-PB-TBUS** active termination resistor ensures interference-free communication in PROFIBUS and RS-485 networks.

- Permanently active termination of the bus line, particularly in applications involving alternating bus devices
- Diagnostic LEDs for voltage and data activity
- Fixed programming interface in the network
- Termination can be connected externally
- Electrical isolation of power supply and data interface
- Redundant power supply
- Installation as single device or in combination with other devices
- Supply voltage routed through a DIN rail connector for use in combination with other devices
- Extended temperature range, -40 °C ... +70 °C

Active bus termination for PROFIBUS and RS-485 2-wire systems

Technical data

Supply		
Supply voltage		24 V DC (via plug-in COMBICON screw terminal block)
Supply voltage range		18 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Nominal current consumption		10 mA (24 V DC, no load on D-SUB)
RS-485 interface		PROFIBUS acc. to IEC 61158, RS-485 2-conductor
Termination resistor		390 Ω / 220 Ω / 390 Ω (Can be connected)
Transmission speed		≤ 12 Mbps
Transmission length		≤ 1200 m (Depends on transmission speed and cable type)
Connection method		D-SUB 9, COMBICON
General data		
Test voltage		1.5 kV AC (50 Hz, 1 min.)
Ambient temperature range		-40 °C ... 70 °C
Housing material		PA 6.6-FR
Electrical isolation		DIN EN 50178 (RS-485 // VCC)
Dimensions	W / H / D	22.5 mm / 92 mm / 73 mm
EMC note		Class A product, see page 525
Conformance/Approvals		
UL, USA/Canada		508 listed

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Active termination resistor, bus termination can be activated, programming interface	**PSI-TERMINATOR-PB-TBUS**	2702636	1

Interface converters
RS-232 (V.24) / RS-422 (V.11)
RS-232 (V.24) / RS-485

PSM-ME-RS232/RS485-P

The RS-422 standard can be used to set up rapid, interference-free point-to-point connections in industrial applications.

The RS-485 standard allows more than two devices to communicate with one another. Converting the RS-232 point-to-point interface into the bus-capable RS-485 standard makes it possible to network up to 32 devices via a 2- or 4-wire cable.

Features:

– RS-422 4-wire point-to-point mode
– RS-485 2-wire mode, half duplex
– RS-485 4-wire mode, full duplex
– Automatic RS-485 transmit/receive changeover
– Integrated data indicator for dynamic indication of send and receive data
– High-quality 3-way isolation for safe decoupling of potentials

Applications:

– Fast and interference-free point-to-point connection between two RS-232 interfaces via RS-422
– Increase in range or remote transmission up to 1200 m

PSM-EG-RS 232/RS 422-P/4K

The PSM-EG... control cabinet module also converts the RS-232 signals in full duplex mode with a data rate of up to 64 kbps to the powerful RS-422 standard. However, in addition to the TxD/RxD transmit and receive channels, the converter also provides two further channels for transmitting RTS and CTS control lines.

Features:

– RS-422 4-wire point-to-point mode
– High-quality 3-way isolation between power supply, RS-232, and RS-422 for reliable electrical isolation of the potentials with 2.5 kV
– Integrated surge protection with transient discharge to the DIN rail

Applications:

– Fast and interference-free point-to-point connection between two RS-232 interfaces via RS-422
– Programming or parameterizing link between PC (RS-232) and a piece of equipment such as a PLC or variable frequency drive with an RS-422 connection
– Increased range of up to 1200 m, incl. control cables

RS-232 converter for RS-485 and RS-422

Ex:

Technical data

		PSM-ME-RS232/RS485-P	PSM-EG-RS232/RS422-P/4K
Supply			
Supply voltage range		18 V AC/DC ... 30 V AC/DC (via plug-in COMBICON screw terminal block)	19.2 V DC ... 28.8 V DC
Nominal current consumption		85 mA (24 V DC)	130 mA (24 V DC)
RS-232 Interface		RS-232 interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1	
Transmission speed		1.2; 2.4; 4.8; 7.2; 9.6; 19.2; 31.25; 38.4; 57.6; 75; 93.75; 115.2 kbps	64 kbps
Connection method		D-SUB 9 connector	D-SUB 9 connector
RS-422 interface		RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1	
Termination resistor		390 Ω / 150 Ω / 390 Ω (Can be connected)	510 Ω / 150 Ω / 510 Ω (Can be connected)
Transmission speed		1.2; 2.4; 4.8; 9.6; 19.2; 38.4; 57.6; 75; 93.75; 115.2 kbps	64 kbps
Transmission length		1200 m (shielded twisted pair)	1200 m (twisted pair)
Connection method		Plug-in screw connection	D-SUB-15 connector
RS-485 interface		RS-485 interface in acc. with EIA/TIA-485, DIN 66259-1	
Data direction switching		Automatic control or via RTS/CTS	
Termination resistor		390 Ω / 150 Ω / 390 Ω (Can be connected)	
Transmission speed		1.2; 2.4; 4.8; 9.6; 19.2; 38.4; 57.6; 75; 93.75; 115.2 kbps	
Transmission length		1200 m (shielded twisted pair)	
Connection method		Plug-in screw connection	
General data			
bit delay		≤ 2.5 µs	≤ 3 µs
Test voltage		1.5 kV AC	2.5 kV
Ambient temperature range		-40 °C ... 70 °C	0 °C ... 50 °C
Transmission channels		2 (1/1), RxD, TxD, full duplex	4 (2/2), RxD, TxD, RTS, CTS; full duplex
Electrical isolation		VCC // RS-232 // RS-485	VCC // RS-232 // RS-422
Dimensions	W / H / D	22.5 mm / 99 mm / 114.5 mm	45 mm / 75 mm / 110 mm
EMC note		Class A product, see page 525	
Conformance/Approvals			
UL, USA/Canada		508 recognized Class I, Div. 2, Groups A, B, C, D Class I, Zone 2, AEx nA IIC T4 Class I, Zone 2, Ex nA IIC T4 Gc X	cUL 508 Recognized

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Interface converter			
- for implementing RS-232 (V.24) on RS-485	**PSM-ME-RS232/RS485-P**	2744416	1
- for implementing RS-232 (V.24) on RS-422 (V.11)	**PSM-EG-RS232/RS422-P/4K**	2761266	1

Accessories

RS-232-D-SUB cable, length: 2 m			
- 9-pos. socket on 25-pos. socket	**PSM-KA 9 SUB 25/BB/2METER**	2761059	1
- 9-pos. socket on 9-pos. socket	**PSM-KA9SUB9/BB/2METER**	2799474	1

Interface separators RS-232/RS-232

The (RS-232) interface is an asymmetric voltage interface (common signal ground for all signals). As well as having a very low signal power, the signal ground is connected to ground potential. This results in very little immunity to interference and a maximum range of 15 m.

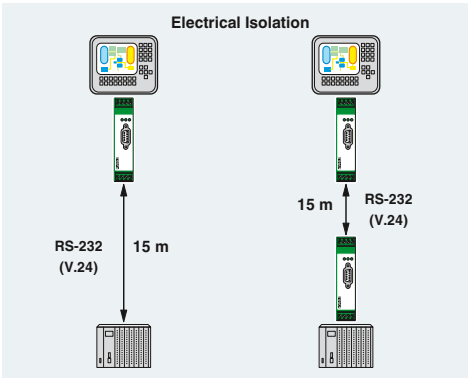
A considerably higher level of immunity to interference can be achieved in industrial applications by using (RS-232) isolator modules. The high-quality 3-way isolation results in an electrically isolated and interference-proof (RS-232) interface. This decoupling also protects the expensive terminal devices against damage.

Features:

- High-quality 3-way isolation up to 2 kV (VCC // (RS-232) // (RS-232))
- Max. transmission rate of up to 115.2 kbps
- 24 V DC or AC power supply suitable for control cabinet
- Mounting on standard EN DIN rails
- Integrated surge protection with transient discharge to the DIN rail
- In the case of variable cable lengths, the (RS-232) connection on the field side can be established conveniently using plug-in screw terminal blocks
- Transmission of TxD/RxD data channels and RTS/CTS control lines
- Active data transmission indicated by separate data indicators for the transmit and receive channels

Application:

- Higher level of immunity to interference for industrial conditions
- Compensating currents avoided through electrical isolation
- Protection of expensive terminal devices through decoupling
- Optimum protection of both interface sides thanks to two (RS-232)/(RS-232) interface isolators



(RS-232) interface isolator

Ex:

Technical data

Supply		
Supply voltage		24 V AC/DC ±20 %
Supply voltage range		19.2 V AC/DC ... 28.8 V AC/DC
Nominal current consumption		40 mA (24 V DC)
RS-232 Interface		RS-232 interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1
Transmission speed		115.2 kbps
Transmission length		15 m (shielded twisted pair)
Connection method		D-SUB 9 connector Plug-in screw connection
General data		
bit distortion		< 5 %
bit delay		< 3 µs
Test voltage		2 kV_{rms} (50 Hz, 1 min.)
Ambient temperature range		0 °C ... 55 °C
Housing material		PA
Transmission channels		4 (2/2), RxD, TxD, RTS, CTS; full duplex
Electrical isolation		VCC // RS-232 (A) // RS-232 (B)
Dimensions	W / H / D	22.5 mm / 99 mm / 118.6 mm
EMC note		Class A product, see page 525
Conformance/Approvals		
UL, USA/Canada		508 recognized Class I, Div. 2, Groups A, B, C, D Class I, Zone 2, AEx nA IIC T4 Class I, Zone 2, Ex nA IIC T4 Gc X

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Interface isolator, for electrical isolation of RS-232 (V.24) interfaces, four channels, rail-mountable	**PSM-ME-RS232/RS232-P**	2744461	1

Accessories

Description	Type	Order No.	Pcs./Pkt.
RS-232-D-SUB cable, length: 2 m - 9-pos. socket on 25-pos. socket	**PSM-KA 9 SUB 25/BB/2METER**	2761059	1
- 9-pos. socket on 9-pos. socket	**PSM-KA9SUB9/BB/2METER**	2799474	1

Interface converters
RS-232/TTY

RS-232 / TTY interface converter

This converter converts a RS-232 interface into a 20 mA TTY current loop interface bidirectionally.

The interference immune TTY signal allows problem-free data transmission over distances of up to 1000 m using a twisted-pair and shielded 4-wire cable.

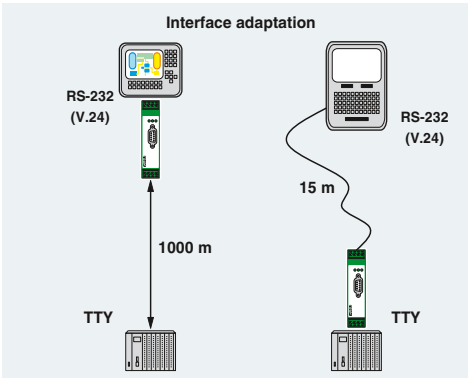
Features:

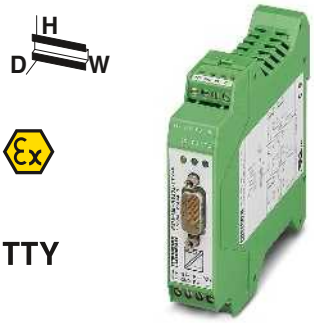
- Conversion of RS-232 TxD/RxD full duplex data signals into the TTY current loop standard
- Semi-active, active or passive TTY operating mode, depending on pin assignment
- Transmission speed of up to 19.2 kbps
- Transmission distances of up to 1000 m in active TTY mode
- 24 V DC or AC power supply suitable for control cabinet
- Active data transmission indicated by separate data indicators for the transmit and receive channels
- Convenient connection for variable cable lengths, enabling the TTY connection on the field side to be established via plug-in screw terminal blocks
- RS-232 connection via D-SUB 9 and standard RS-232 cable
- High-quality 3-way isolation up to 2 kV (VCC // RS-232 // TTY)
- Mounting on standard EN DIN rails
- Integrated surge protection with transient discharge to the DIN rail

Application:

The following tasks are generally solved with the converters (see illustration):

- Interface adaptation between V.24 (RS-232) and TTY interfaces
- Increased range of up to 1000 m
- Programming connection between PC (RS-232) and, for example, S5 controllers with TTY programming interface for temporary coupling





TTY converter, 2 channels

Ex:

Technical data

Supply		
Supply voltage		24 V AC/DC ±20 % (via plug-in COMBICON screw terminal block)
Nominal current consumption		75 mA (24 V DC)
RS-232 Interface		RS-232 interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1
Transmission speed		≤ 19.2 kbps
Transmission length		15 m (shielded twisted pair)
Connection method		D-SUB 9 connector
TTY interface		TTY interface, CL2 in acc. with DIN 66348-1
Transmission speed		≤ 19.2 kbps
Transmission length		1000 m (shielded twisted pair)
Connection method		Plug-in screw connection
Operating mode		Active, semi active, passive
Load		≤ 500 Ω
General data		
bit distortion		< 5 %
bit delay		< 3 µs
Test voltage		2 kV_{rms} (50 Hz, 1 min.)
Ambient temperature range		0 °C ... 55 °C
Housing material		PA
Transmission channels		2 (1/1), RxD, TxD, full duplex
Electrical isolation		VCC // RS-232 // TTY
Dimensions	W / H / D	22.5 mm / 99 mm / 118.6 mm
EMC note		Class A product, see page 525
Conformance/Approvals		
UL, USA/Canada		508 recognized Class I, Div. 2, Groups A, B, C, D Class I, Zone 2, AEx nA IIC T4 Class I, Zone 2, Ex nA IIC T4 Gc X

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Interface converter, for conversion from RS-232 (V.24) to TTY, with electrical isolation, two channels, rail-mountable	**PSM-ME-RS232/TTY-P**	2744458	1

Accessories

RS-232-D-SUB cable, length: 2 m - 9-pos. socket on 25-pos. socket - 9-pos. socket on 9-pos. socket	**PSM-KA 9 SUB 25/BB/2METER** **PSM-KA9SUB9/BB/2METER**	2761059 2799474	1 1

FO converters for PROFIBUS

The **PSI-MOS-PROFIB/FO...** devices convert copper-based PROFIBUS interfaces to fiber optics.

The integrated optical diagnostics allow permanent monitoring of the FO paths during installation and also during operation. The floating switch contact is activated when the signal output on the fiber optic paths drops to a critical level.

Depending on which wavelength is used in conjunction with the corresponding fibers, transmission distances of 70 m to 45 km can be achieved between two devices. Depending on the wavelength, devices can be used with polymer, PCF, and fiberglasss.

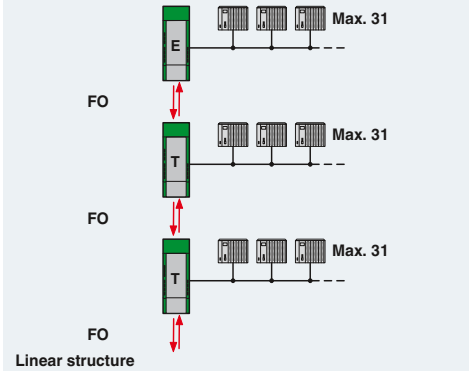
- Automatic data rate detection or fixed data rate setting via DIP switches
- Suitable for all data rates of up to 12 Mbps
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (PROFIBUS // fiber optic ports // power supply // DIN rail connector)
- bit retiming for any cascading depth
- Routing of supply voltage and data signals through DIN rail connectors
- Redundant power supply supported in the form of optional system power supply
- Can be combined with the PSI copper repeater for PROFIBUS in a modular way using DIN rail connectors

The **PSI-MOS-PROFIB/FO... E** terminal devices convert a PROFIBUS interface for a **FO cable**. They are ideal for point-to-point connections.

The **PSI-MOS-PROFIB/FO... T** T-couplers allow the interface to be converted for two **FO cables**. They can be used to create linear structures and ring structures for increased system availability.

Supply	
Supply voltage range	
Nominal current consumption	
RS-485 interface	
Data format/coding	
Transmission speed	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length Incl. 3 dB system reserve	
General data	
bit delay	
Alarm output	
Ambient temperature range	
Dimensions	W / H / D
EMC note	
Conformance/Approvals	
ATEX	
UL, USA/Canada	

Description
FO converter, for converting data signals to fiber optics
- Terminal device with one FO interface - T-coupler with two FO interfaces
DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device
DIN rail connector, (optional), for routing through of the supply voltage, 2 required per device
System power supply, primary-switched



PROFIBUS
polymer and PCF fibers

Ex:

Technical data

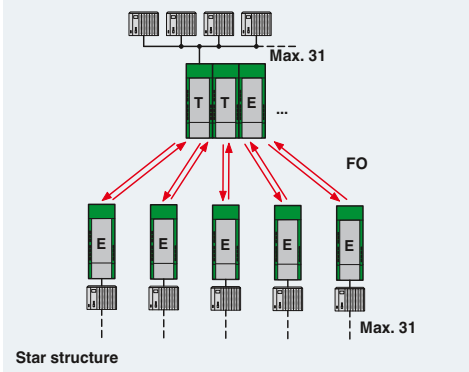
18 V DC ... 30 V DC	
100 mA (24 V DC)	
PROFIBUS acc. to IEC 61158, RS-485 2-wire, half duplex, automatic control	
UART (11 bit, NRZ)	
≤ 12 Mbps	
≤ 1200 m (depending on the data rate, with shielded, twisted pair data cable)	
D-SUB-9 socket	
F-SMA	
660 nm	
70 m (With F-P 980/1000 230 dB/km with quick mounting connector)	
400 m (With F-K 200/230 10 dB/km with quick mounting connector)	
< 1 bit	
60 V DC / 42 V AC ; 0.46 A	
-20 °C ... 60 °C	
35 mm / 99 mm / 106 mm	
Class A product, see page 525	
II 3 G Ex nA nC IIC T4 Gc X	
II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U)	
II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U)	
Class I, Zone 2, AEx nc IIC T5	
Class I, zone 2, Ex nC nL IIC T5 X	
Class I, Div. 2, Groups A, B, C, D	

Ordering data

Type	Order No.	Pcs./Pkt.
PSI-MOS-PROFIB/FO 660 E	**2708290**	1
PSI-MOS-PROFIB/FO 660 T	**2708287**	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1



Star structure

PROFIBUS
PCF and fiberglasss
(multi-mode)

Ex:

Technical data

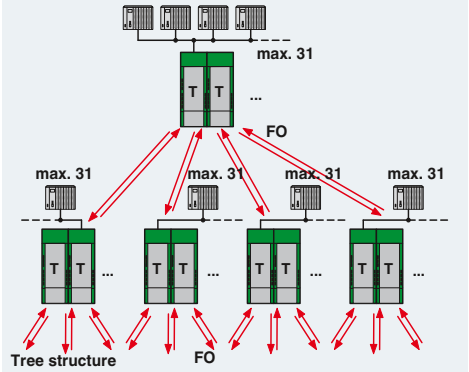
18 V DC ... 30 V DC	
120 mA (24 V DC)	
PROFIBUS acc. to IEC 61158, RS-485 2-wire, half duplex, automatic control	
UART (11 bit, NRZ)	
≤ 12 Mbps	
≤ 1200 m (depending on the data rate, with shielded, twisted pair data cable)	
D-SUB-9 socket	
B-FOC (ST®)	
850 nm	
2600 m (with F-G 50/125 2.5 dB/km)	
3300 m (with F-G 62,5/125 3.0 dB/km)	
800 m (With F-K 200/230 10 dB/km with quick mounting connector)	
< 1 bit	
60 V DC / 42 V AC ; 0.46 A	
-20 °C ... 60 °C	
35 mm / 99 mm / 106 mm	
Class A product, see page 525	
II 3 G Ex nA nC IIC T4 Gc X	
II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U)	
II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U)	
Class I, Zone 2, AEx nc IIC T5	
Class I, zone 2, Ex nC nL IIC T5 X	
Class I, Div. 2, Groups A, B, C, D	

Ordering data

Type	Order No.	Pcs./Pkt.
PSI-MOS-PROFIB/FO 850 E	**2708274**	1
PSI-MOS-PROFIB/FO 850 T	**2708261**	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1



Tree structure

PROFIBUS
fiberglass
(multi-mode and single-mode)

Technical data

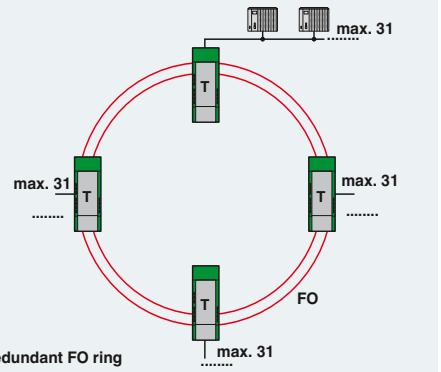
18 V DC ... 32 V DC	
55 mA (24 V DC)	
PROFIBUS acc. to IEC 61158, RS-485 2-wire, half duplex, automatic control	
UART (11 bit, NRZ)	
≤ 12 Mbps	
≤ 1200 m (depending on the data rate, with shielded, twisted pair data cable)	
D-SUB-9 socket	
SC duplex	
1300 nm	
25 km (With F-G 50/125 0.7 dB/km at 1300 nm)	
22 km (with F-G 62.5/125 0.8 dB/km at 1300 nm)	
45 km (With F-E 9/125 0,4 dB/km at 1300 nm)	
< 1 bit	
60 V DC / 42 V AC ; 1 A	
-20 °C ... 60 °C	
35 mm / 105 mm / 106 mm	
Class A product, see page 525	
II 3 G Ex nA nC IIC T4 Gc X	
508 listed	
508 recognized	

Ordering data

Type	Order No.	Pcs./Pkt.
PSI-MOS-PROFIB/FO1300 E	**2708559**	1
PSI-MOS-PROFIB/FO1300 T	**2708892**	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1



Redundant FO ring

FO converters for DeviceNet™ and CANopen®

The PSI-MOS-DNET... fiber optic transmission system enables DeviceNet™ and CANopen® users to benefit from simple and interference-free networking based on fiber optics. In addition, bus cable short circuits only affect the specific potential segment concerned. This increases overall availability, and improves flexibility when designing the bus topology. The use of fiber optic technology enables branch lines and star and tree structures to be created.

The 22.5 mm space-saving devices from the **PSI-MOS-DNET CAN/FO...** series feature an internal backplane. The maximum network expansion that can be achieved (sum total of copper and fiber optic cables) essentially depends on the data rate used.

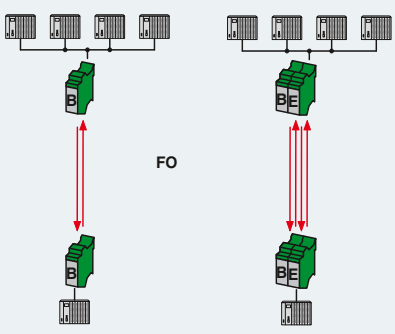
– Data rates of up to 800 kbps, set via DIP switches
– Integrated optical diagnostics for continuous monitoring of fiber optic paths
– Floating switch contact in basic module for leading alarm generation in relation to critical fiber optic paths
– High-quality electrical isolation between all interfaces (DeviceNet // fiber optic port // power supply // backplane)
– Integrated backplane for routing through the supply voltage and data signals

Thanks to extended functions, the modular devices in the **PSI-MOS-DNET/FO...** series support network expansion that is not dependent on the data rate.

– Automatic data rate detection or fixed data rate setting via DIP switches
– Data rates of up to 1000 kbps
– Integrated optical diagnostics for continuous monitoring of fiber optic paths
– Floating switch contact for leading alarm generation in relation to critical fiber optic paths
– High-quality electrical isolation between all interfaces (DeviceNet // fiber optic ports // power supply // DIN rail connector)
– Routing of supply voltage and data signals through DIN rail connectors
– Redundant power supply supported in the form of optional system power supply
– Can be combined with the PSI copper repeater in a modular way using DIN rail connectors

Supply	
Supply voltage range	
Nominal current consumption	
CAN interface	
Termination resistor	
Transmission speed	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length Incl. 3 dB system reserve	
General data	
bit delay	
Alarm output	
Test voltage	
Ambient temperature range	
Dimensions	W / H / D
EMC note	
Conformance/Approvals	
ATEX	
UL, USA/Canada	

Description
FO converter, for converting data signals to fiber optics
- Basic module with one FO interface - Extension module with one FO interface
- Terminal device with one FO interface - T-coupler with two FO interfaces



Branch line / redundant branch line

DeviceNet™ and CANopen®
Polymer and PCF fibers

Ex:

Technical data

10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
100 mA (24 V DC)
CAN interface, in accordance with ISO/IS 11898 for DeviceNet, CAN, CANopen
120 Ω (Can be connected)
≤ 800 kbps
≤ 5000 m (Dependent on the data rate and the protocol used)
Plug-in screw connection
F-SMA
660 nm
100 m (With F-P 980/1000 230 dB/km with quick mounting connector) 800 m (With F-K 200/230 10 dB/km with quick mounting connector)
< 1 bit
60 V DC / 42 V AC ; 0.46 A
1.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C
22.5 mm / 99 mm / 114.5 mm
Class A product, see page 525
II 3 G Ex nA nC IIC T4 Gc X II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U) II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U) Class I, Zone 2, AEx nc IIC T5 Class I, Div. 2, Groups A, B, C, D

Ordering data

Type	Order No.	Pcs./Pkt.
PSI-MOS-DNET CAN/FO 660/BM	2708054	1
PSI-MOS-DNET CAN/FO 660/EM	2708067	1

DeviceNet™ and CANopen®
HCS and fiberglass
(multi-mode)

Ex:

Technical data

10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
100 mA (24 V DC)
CAN interface, in accordance with ISO/IS 11898 for DeviceNet, CAN, CANopen
120 Ω (Can be connected)
≤ 800 kbps
≤ 5000 m (Dependent on the data rate and the protocol used)
Plug-in screw connection
B-FOC (ST®)
850 nm
2800 m (with F-K 200/230 8 dB/km with quick mounting connector) 4800 m (with F-G 50/125 2.5 dB/km) 4200 m (with F-G 62,5/125 3.0 dB/km)
< 1 bit
60 V DC / 42 V AC ; 0.46 A
1.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C
22.5 mm / 99 mm / 114.5 mm
Class A product, see page 525
II 3 G Ex nA nC IIC T4 Gc X II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U) II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U) Class I, Zone 2, AEx nc IIC T5 Class I, Div. 2, Groups A, B, C, D

Ordering data

Type	Order No.	Pcs./Pkt.
PSI-MOS-DNET CAN/FO 850/BM	2708083	1
PSI-MOS-DNET CAN/FO 850/EM	2708096	1

DeviceNet™ and CANopen®
PCF and fiberglass
(multi-mode) external backplane

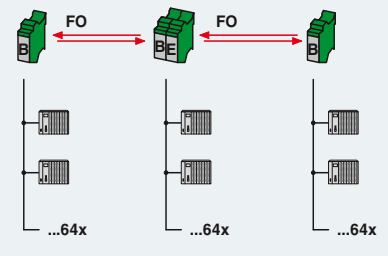
Ex:

Technical data

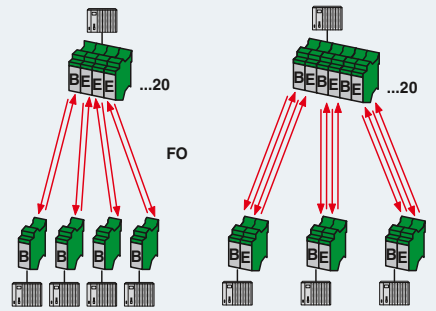
11 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
130 mA (24 V DC)
CAN interface, in accordance with ISO/IS 11898 for DeviceNet, CAN, CANopen
124 Ω (Integrated and ready to be switched)
≤ 1 Mbps (Configurable via DIP switches)
≤ 5000 m (Dependent on the data rate and the protocol used)
COMBICON connector screw terminal block
B-FOC (ST®)
850 nm
1800 m (with F-K 200/230 8 dB/km with quick mounting connector) 4600 m (with F-G 50/125 2.5 dB/km) 4200 m (with F-G 62,5/125 3.0 dB/km)
≤ 1 bit (configurable)
11 V DC ... 30 V DC ; 500 mA
1.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C
35 mm / 102 mm / 119 mm
Class A product, see page 525
II 3 G Ex nA IIC T4 Gc X II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U) II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U) 508 listed

Ordering data

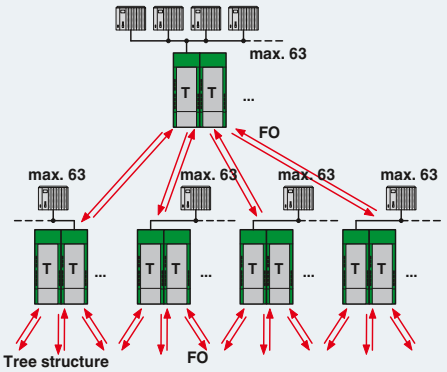
Type	Order No.	Pcs./Pkt.
PSI-MOS-DNET/FO 850 E	2313999	1
PSI-MOS-DNET/FO 850 T	2313986	1



Linear structure



Star structure / redundant star structure



Tree structure

FO converters for RS-485 2-wire bus systems

The RS-485 2-wire interface is the most widely used interface in the field of automation technology. Well-known bus systems, such as SUCONET K, Modbus-ASCII, Modbus/RTU, S-BUS, and DH-485, are all based on this interface, as are many other company-specific bus systems.

The **PSI-MOS-RS485W2/FO...** FO converters convert the electrical data signal into an optical one by protocol transparent means.

The integrated optical diagnostics allow permanent monitoring of the FO paths during installation and also during operation. The floating switch contact is activated when the signal output on the fiber optic paths drops to a critical level.

Depending on which wavelength is used in conjunction with the corresponding fibers, distances of 100 m to 45 km can be achieved between two devices.

- Automatic data rate detection or fixed data rate setting via DIP switches
- Suitable for data rates of up to 500 kbps
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (RS-485 // fiber optic ports // power supply // DIN rail connector)
- Routing of supply voltage and data signals through DIN rail connectors
- Redundant power supply supported in the form of optional system power supply
- Can be combined with the PSI copper repeater in a modular way using DIN rail connectors

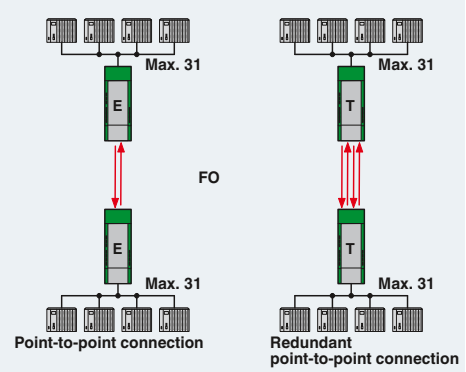
The **PSI-MOS-RS485W2/FO... E** terminal devices convert an RS-485 interface to a fiber optic cable. They are ideal for point-to-point connections.

The **PSI-MOS-RS485W2/FO... T** T-couplers allow the interface to be converted for **two FO cables**. They can be used to create linear structures and redundant structures for increased system availability.

Supply voltage range	
Nominal current consumption	
RS-485 interface	
Data format/coding	
Termination resistor	
Transmission speed	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length Incl. 3 dB system reserve	
General data	
Test voltage	
Ambient temperature range	
Dimensions	W / H / D
EMC note	
Conformance/Approvals	
ATEX	
UL, USA/Canada	

Description
FO converter, for converting data signals to fiber optics
- Terminal device with one FO interface - T-coupler with two FO interfaces

DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device
DIN rail connector, (optional), for routing through of the supply voltage, 2 required per device
System power supply, primary-switched



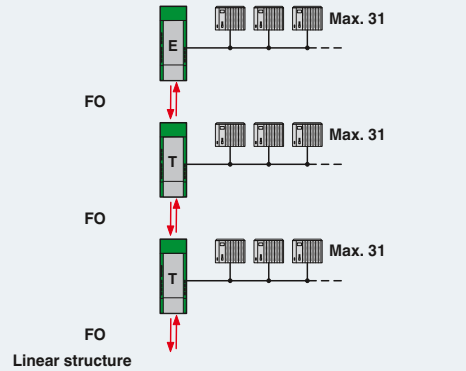
RS-485 2-wire
polymer and PCF fibers

Ex:

Technical data	
	18 V DC ... 30 V DC
	100 mA (24 V DC)
	RS-485 interface, 2-wire
	UART (11/10 bit switchable; NRZ), slip-tolerant
	390 Ω / 220 Ω / 390 Ω (Can be connected)
	4.8/ 9.6/ 19.2/ 38.4/ 57.6/ 75/ 93.75/ 115.2/ 136/ 187.5/ 375/ 500 kbps
	≤ 1200 m (depending on the data rate, with shielded, twisted data cable)
	Plug-in screw connection
	F-SMA
	660 nm
	100 m (With F-P 980/1000 230 dB/km with quick mounting connector)
	800 m (With F-K 200/230 10 dB/km with quick mounting connector)
	1.5 kV_{rms} (50 Hz, 1 min.)
	-20 °C ... 60 °C
	35 mm / 99 mm / 105 mm
	Class A product, see page 525
	II 3 G Ex nA nC IIC T4 Gc X
	II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U)
	II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U)
	Class I, Zone 2, AEx nc IIC T5
	Class I, zone 2, Ex nC nL IIC T5 X
	Class I, Div. 2, Groups A, B, C, D

Ordering data		
Type	**Order No.**	Pcs./Pkt.
PSI-MOS-RS485W2/FO 660 E	2708313	1
PSI-MOS-RS485W2/FO 660 T	2708300	1

Accessories		
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



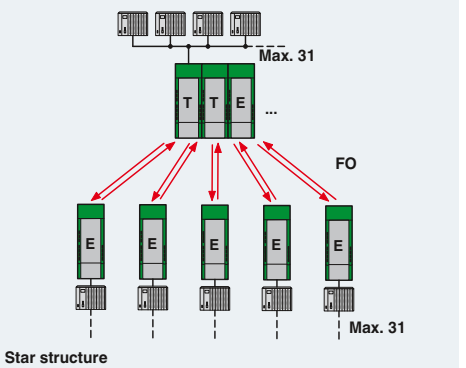
RS-485 2-wire
PCF and fiberglasss
(multi-mode)

Ex:

Technical data	
	18 V DC ... 30 V DC
	120 mA (24 V DC)
	RS-485 interface, 2-wire
	UART (11/10 bit switchable; NRZ), slip-tolerant
	390 Ω / 220 Ω / 390 Ω (Can be connected)
	4.8/ 9.6/ 19.2/ 38.4/ 57.6/ 75/ 93.75/ 115.2/ 136/ 187.5/ 375/ 500 kbps
	≤ 1200 m (depending on the data rate, with shielded, twisted data cable)
	Plug-in screw connection
	B-FOC (ST®)
	850 nm
	2800 m (with F-K 200/230 8 dB/km with quick mounting connector)
	4200 m (with F-G 50/125 2.5 dB/km)
	3300 m (with F-G 62,5/125 3.0 dB/km)
	1.5 kV_{rms} (50 Hz, 1 min.)
	-20 °C ... 60 °C
	35 mm / 99 mm / 105 mm
	Class A product, see page 525
	II 3 G Ex nA nC IIC T4 Gc X
	II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U)
	II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U)
	Class I, Zone 2, AEx nc IIC T5
	Class I, zone 2, Ex nC nL IIC T5 X
	Class I, Div. 2, Groups A, B, C, D

Ordering data		
Type	**Order No.**	Pcs./Pkt.
PSI-MOS-RS485W2/FO 850 E	2708339	1
PSI-MOS-RS485W2/FO 850 T	2708326	1

Accessories		
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1

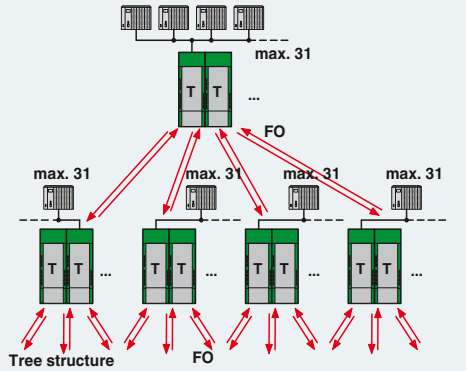


RS-485 2-wire
fiberglass
(multi-mode and single-mode)

Technical data	
	18 V DC ... 32 V DC
	55 mA (24 V DC)
	RS-485 interface, 2-wire
	UART (11/10 bit switchable; NRZ), slip-tolerant
	390 Ω / 220 Ω / 390 Ω (Can be connected)
	4.8/ 9.6/ 19.2/ 38.4/ 57.6/ 75/ 93.75/ 115.2/ 136/ 187.5/ 375/ 500 kbps
	≤ 1200 m (depending on the data rate, with shielded, twisted data cable)
	Plug-in screw connection
	SC duplex
	1300 nm
	25 km (With F-G 50/125 0.7 dB/km at 1300 nm)
	22 km (with F-G 62.5/125 0.8 dB/km at 1300 nm)
	45 km (With F-E 9/125 0,4 dB/km at 1300 nm)
	1.5 kV_{rms} (50 Hz, 1 min.)
	-20 °C ... 60 °C
	35 mm / 99 mm / 105 mm
	Class A product, see page 525
	II 3 G Ex nA nC IIC T4 Gc X
	508 listed
	508 recognized

Ordering data		
Type	**Order No.**	Pcs./Pkt.
PSI-MOS-RS485W2/FO1300 E	2708562	1

Accessories		
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



FO converters for INTERBUS, RS-422, and RS-485 4-wire bus systems

The **PSI-MOS-RS422/FO...** devices are used for converting INTERBUS interfaces for fiber optics.

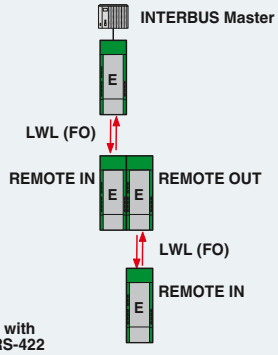
INTERBUS lines are constructed with the **PSI-MOS-RS422...E terminal devices**. The **PSI-MOS-RS422...T T-couplers** also allow redundant **INTERBUS connections** via fiber optics.

If RS-422 terminal devices are used, only one end device can be connected to each PSI-MOS-RS422/FO... device. A suitable communication protocol (e.g., Modbus/RTU) is implemented by means of end device addressing.

- Automatic data rate detection for all data rates up to 2 Mbps
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (copper // FO ports // supply // DIN rail connector)
- Connections can be plugged in using a COMBICON screw terminal block
- Redundant power supply supported in the form of optional system power supply
- Routing through of the supply voltage via the DIN rail connector
- Approved for use in zone 2
- Intrinsically safe FO interface (Ex op is) for direct connection to devices in zone 1 (all 660 and 850 nm versions)

Supply	
Supply voltage range	
Nominal current consumption	
RS-422 interface	
Transmission speed	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length Incl. 3 dB system reserve	
General data	
bit delay	
Alarm output	
Test voltage	
Ambient temperature range	
Dimensions	W / H / D
EMC note	
Conformance/Approvals	
ATEX	
UL, USA/Canada	

Description
FO converter, for converting data signals to fiber optics
- Terminal device with one FO interface - T-coupler with two FO interfaces
DIN rail connector (optional), for routing through of the supply voltage, 2 required per device
System power supply, primary-switched



INTERBUS with PSI-MOS-RS-422

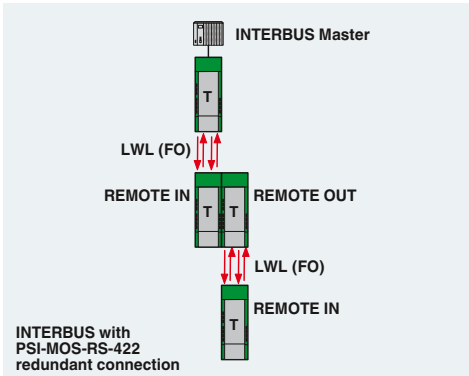
INTERBUS / RS-422 / RS-485 4-wire polymer and PCF fibers

Ex:

Technical data	
	18 V DC ... 30 V DC
	100 mA (24 V DC)
	RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1
	≤ 2 Mbps
	≤ 1000 m (depending on the data rate, with shielded, twisted data cable)
	Plug-in screw connection
	F-SMA
	660 nm
	100 m (With F-P 980/1000 230 dB/km with quick mounting connector)
	800 m (With F-K 200/230 10 dB/km with quick mounting connector)
	< 1 bit
	60 V DC / 42 V AC ; 0.46 A
	1.5 kV_{rms} (50 Hz, 1 min.)
	-20 °C ... 60 °C
	35 mm / 99 mm / 103 mm
	Class A product, see page 525
	II 3 G Ex nA nC IIC T4 Gc X
	II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U)
	II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U)
	Class I, Zone 2, AEx nc IIC T5
	Class I, zone 2, Ex nC nL IIC T5 X
	Class I, Div. 2, Groups A, B, C, D

Ordering data		
Type	**Order No.**	Pcs./Pkt.
PSI-MOS-RS422/FO 660 E	2708342	1
PSI-MOS-RS422/FO 660 T	2708384	1

Accessories		
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



INTERBUS with PSI-MOS-RS-422 redundant connection

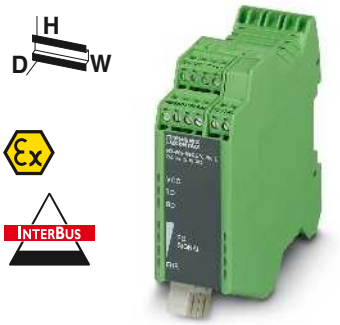
INTERBUS / RS-422 / RS-485 4-wire PCF and fiberglasss (multi-mode)

Ex:

Technical data	
	18 V DC ... 30 V DC
	120 mA (24 V DC)
	RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1
	≤ 2 Mbps
	≤ 1000 m (depending on the data rate, with shielded, twisted data cable)
	Plug-in screw connection
	B-FOC (ST®)
	850 nm
	2800 m (with F-K 200/230 8 dB/km with quick mounting connector)
	4200 m (with F-G 50/125 2.5 dB/km)
	4800 m (with F-G 62,5/125 3.0 dB/km)
	< 1 bit
	60 V DC / 42 V AC ; 0.46 A
	1.5 kV_{rms} (50 Hz, 1 min.)
	-20 °C ... 60 °C
	35 mm / 99 mm / 103 mm
	Class A product, see page 525
	II 3 G Ex nA nC IIC T4 Gc X
	II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U)
	II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U)
	Class I, Zone 2, AEx nc IIC T5
	Class I, zone 2, Ex nC nL IIC T5 X
	Class I, Div. 2, Groups A, B, C, D

Ordering data		
Type	**Order No.**	Pcs./Pkt.
PSI-MOS-RS422/FO 850 E	2708355	1
PSI-MOS-RS422/FO 850 T	2708397	1

Accessories		
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



INTERBUS / RS-422 / RS-485 4-wire fiberglass (multi-mode and single-mode)

Technical data	
	18 V DC ... 32 V DC
	110 mA (24 V DC)
	RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1
	≤ 2 Mbps
	≤ 1000 m (depending on the data rate, with shielded, twisted data cable)
	Plug-in screw connection
	SC duplex
	1300 nm
	27 km (With F-G 50/125 0.7 dB/km at 1300 nm)
	22 km (with F-G 62.5/125 0.8 dB/km at 1300 nm)
	45 km (With F-E 9/125 0,4 dB/km at 1300 nm)
	< 1 bit
	60 V DC / 42 V AC ; 1 A
	1.5 kV_{rms} (50 Hz, 1 min.)
	-20 °C ... 60 °C
	35 mm / 105 mm / 103 mm
	Class A product, see page 525
	II 3 G Ex nA nC IIC T4 Gc X
	508 listed
	508 recognized

Ordering data		
Type	**Order No.**	Pcs./Pkt.
PSI-MOS-RS422/FO1300 E	2708575	1

Accessories		
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1

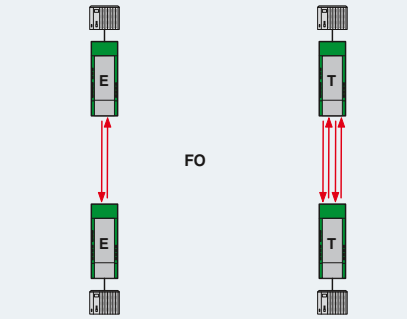
FO converters for RS-232 (V.24)

Due to its electrical properties, the (RS-232) is very susceptible to EMC influences and potential differences. For this reason, it can only be used for short distances of up to max. 15 m. FO transmission technology is, therefore, the first choice for longer transmission distances and for eliminating EMC influences. The **PSI-MOS-RS232/FO...** devices convert the (RS-232) interface for fiber optics. A transparent protocol is used for conversion. If addressable V.24 (RS-232) devices and a suitable communication protocol are used, even multi-point networks can be constructed. These can be implemented as linear, star, and even redundant star structures.

- Automatic data rate detection for all data rates up to 115.2 kbps
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces ((RS-232) // fiber optic ports // power supply // DIN rail connector)
- Redundant power supply supported in the form of optional system power supply
- Connections can be plugged in using a COMBICON screw terminal block
- Routing of supply voltage and data signals through DIN rail connectors
- Approved for use in zone 2
- Intrinsically safe FO interface (Ex op is) for direct connection to devices in zone 1 (all 660 and 850 nm versions)

Supply	
Supply voltage range	
Nominal current consumption	
(RS-232) Interface	
Transmission speed	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length Incl. 3 dB system reserve	
General data	
bit delay	
Alarm output	
Test voltage	
Ambient temperature range	
Dimensions	W / H / D
EMC note	
Conformance/Approvals	
ATEX	
UL, USA/Canada	

Description
FO converter, for converting data signals to fiber optics - Terminal device with one FO interface - T-coupler with two FO interfaces
DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device
DIN rail connector, (optional), for routing through of the supply voltage, 2 required per device
System power supply, primary-switched



Point-to-point connection **Redundant point to point connection**

RS-232

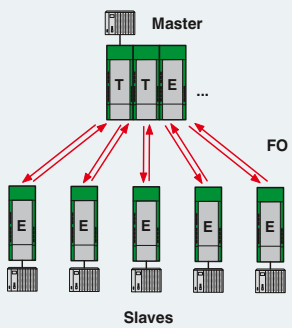
(RS-232)
polymer and PCF fibers

Ex:

Technical data	
18 V DC ... 30 V DC	
100 mA (24 V DC)	
(RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1	
115.2 kbps (NRZ)	
≤ 15 m	
D-SUB 9 connector	
F-SMA	
660 nm	
100 m (With F-P 980/1000 230 dB/km with quick mounting connector) 800 m (With F-K 200/230 10 dB/km with quick mounting connector)	
< 1 bit	
60 V DC / 42 V AC ; 0.46 A	
1.5 kV_{rms} (50 Hz, 1 min.)	
-20 °C ... 60 °C	
35 mm / 99 mm / 105 mm	
Class A product, see page 525	
II 3 G Ex nA nC IIC T4 Gc X II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U) II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U)	
Class I, Zone 2, AEx nc IIC T5 Class I, zone 2, Ex nC nL IIC T5 X Class I, Div. 2, Groups A, B, C, D	

Ordering data		
Type	**Order No.**	Pcs./Pkt.
PSI-MOS-RS232/FO 660 E	2708368	1
PSI-MOS-RS232/FO 660 T	2708410	1

Accessories		
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



Star structure

RS-232

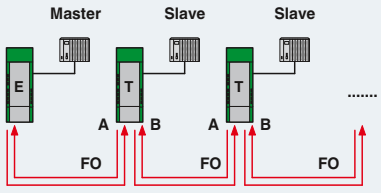
(RS-232)
PCF and fiberglasss
(multi-mode)

Ex:

Technical data	
18 V DC ... 30 V DC	
120 mA (24 V DC)	
(RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1	
115.2 kbps (NRZ)	
≤ 15 m	
D-SUB 9 connector	
B-FOC (ST®)	
850 nm	
2800 m (with F-K 200/230 8 dB/km with quick mounting connector) 4200 m (with F-G 50/125 2.5 dB/km) 4800 m (with F-G 62,5/125 3.0 dB/km)	
< 1 bit	
60 V DC / 42 V AC ; 0.46 A	
1.5 kV_{rms} (50 Hz, 1 min.)	
-20 °C ... 60 °C	
35 mm / 99 mm / 105 mm	
Class A product, see page 525	
II 3 G Ex nA nC IIC T4 Gc X II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U) II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U)	
Class I, Zone 2, AEx nc IIC T5 Class I, zone 2, Ex nC nL IIC T5 X Class I, Div. 2, Groups A, B, C, D	

Ordering data		
Type	**Order No.**	Pcs./Pkt.
PSI-MOS-RS232/FO 850 E	2708371	1
PSI-MOS-RS232/FO 850 T	2708423	1

Accessories		
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



Master/Slave line structure

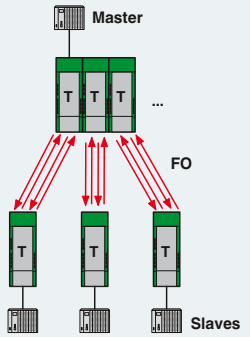
RS-232

(RS-232)
fiberglass
(multi-mode and single-mode)

Technical data	
18 V DC ... 32 V DC	
100 mA (24 V DC)	
(RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1	
115.2 kbps (NRZ)	
≤ 15 m	
D-SUB 9 connector	
SC duplex	
1300 nm	
27 km (With F-G 50/125 0.7 dB/km at 1300 nm) 22 km (with F-G 62.5/125 0.8 dB/km at 1300 nm) 45 km (With F-E 9/125 0,4 dB/km at 1300 nm)	
< 1 bit	
60 V DC / 42 V AC ; 1 A	
1.5 kV_{rms} (50 Hz, 1 min.)	
-20 °C ... 60 °C	
35 mm / 99 mm / 105 mm	
Class A product, see page 525	
II 3 G Ex nA nC IIC T4 Gc X	
508 listed 508 recognized	

Ordering data		
Type	**Order No.**	Pcs./Pkt.
PSI-MOS-RS232/FO1300 E	2708588	1

Accessories		
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



Redundant structure

Fiber optic data transmission in the industrial field has increasingly gained in importance over the past years. In particularly critical applications with very high requirements regarding availability it has become standard. This is due to the many advantages that fiber optic data transmission has over traditional copper systems.

The main advantages are:

– Maximum resistance to interference, even when exposed to extreme electromagnetic influences.
– High-grade electrical isolation between the devices.
– Maximum transmission distances of several dozen kilometers with an extremely high data rate
– The maximum number of devices is not limited by the electrical properties of the communication interface used

This leads to a marked gain in performance and immunity to interference for the communication infrastructure in industrial applications, without having to allow for complex surge protection measures, shielding and equipotential bonding concepts.

Inexpensive terminal devices and polymer fiber cables are used for distances of up to 100 m. The cable can be self-assembled quickly using F-SMA fast connectors. The terminal devices transmit the light with a wave length of 660 nm.

The optical components based on this wave length can be produced cost-effectively. As a result, cost-effective terminal devices can be offered. In conjunction with cost-effective polymer fiber and the simple connection technology, this provides an attractive introduction to FO technology.

For distances of up to 800 m, the same 660 nm terminal devices can be used, but this time with PCF cable. This cable can also be self-assembled with fast connectors. All that is required is a special tool for stripping as well as cutting the optical fibers.

If you wish to cover distances of up to 2800 m with PCF cables and fast connection technology, you must use terminal devices with powerful optical components featuring 850 nm technology. Terminal devices equipped with this technology can cover distances of up to 4800 m when using multimode fiberglass.

In many applications, such as tunnel construction or transportation technology, even these distances are not long enough. In this case, terminal devices with optical interfaces with 1300 nm technology, which are designed for maximum performance, come into play. With multimode fiberglass, these devices can cover distances of up to 25 km and, using single-mode fiberglass (often referred to as monomode fiberglass), even distances of up to 45 km.

Cables – by the meter

Phoenix Contact cables and connection systems offer solutions for various fields of application.

– Polymer Optical Fiber (POF): Up to a maximum of 100 Mbps
– Polymer-Cladded Fiber (PCF): Up to a maximum of 1 Gbps
– Glass Optical Fiber (GOF) multimode: Up to 10 Gbps
– Glass Optical Fiber (GOF) single-mode: Up to 40 Gbps

Your web code: #1516

Cables – assembled

Implement flexible, consistent data transmission solutions based on our comprehensive range of standardized FO connectors.

– Compact LC duplex connectors
– SC-RJ with push-pull technology for POF, PCF, and GOF
– Established F-SMA and ST connectors

Your web code: #0524

Patch cables, fixed

The patch cables have a robust design for industrial use. The strong outer sheath and connector transitions with bending protection sleeve mean that they can be safely used inside control cabinets.

– Pre-assembled patch cables for fast integration of fiber optic devices into existing fiber optic networks
– For the SC-RJ, SC duplex, LC, and B-FOC (ST®) connector formats
– Single and multimode fiberglass in lengths of one, two, and five meters

Your web code: #0526

Assembly tool

Assemble fiber optic cables directly in the field. The assembly tools from Phoenix Contact enable reliable connection in next to no time.

– Tools for all fiber types
– No bonding or polishing, thanks to mechanical splice
– Tool sets with practical accessories

Your web code: #1515

Connectors

These connectors are easy to assemble and allow fast and simple self-assembly on site. They correspond to the international F-SMA, B-FOC (ST®), SC-RJ, and SC duplex standards, though their quick mounting mechanism makes them stand out from the conventional connectors.

The tools required are available as a complete assembly case for polymer and HCS fibers.

Your web code: #0493

Couplings

Couplings connect FO connectors with the same pin arrangement. Couplings are also used when a cable needs to be extended or when creating a non-permanent panel feed-through.

The sets include two F-SMA couplings or two B-FOC (ST®) couplings for connecting duplex cables.

The SC-RJ duplex, SC duplex, and LC couplings are supplied separately.

Your web code: #1514

Media converters – universal devices

Optical transmission with FO technology provides superior immunity to interference at maximum transmission ranges without restricting the transmission bandwidth.

General features

– Auto negotiation and auto MDI/MDIx
– Connection monitoring with LFPT (link fault pass through)
– Signal LEDs for activity, link status, 10/100 Mbps
– Backplane bus contact, enabling alternative or redundant 24 V power supply

Devices with 1300 nm wavelength

The FL MC EF 1300... media converters support universal use.

Features:

– 1300 nm wavelength
– Multimode or single-mode fiberglass cable
– B-FOC (ST®) or SC duplex

Devices with WDM technology

The FL MC EF WDM... media converters enable full duplex communication with a single glass fiber via WDM technology (Wavelength Division Multiplex).

Features:

– 1310 nm and 1550 nm wavelengths for transmitting and receiving
– Multimode or single-mode fiberglass cable
– SC simplex connection

Devices with 660 nm wavelength

The FL MC EF 660 SCRJ media converter is designed for use in networks with short distances.

Features:

– 660 nm wavelength
– Polymer and PCF fibers
– SC-RJ connection
– Easy connection of the FO connector
– LED bar graph for signaling the optical receiving capacity

WDM technology
Single-fiber transmission

Ex:

Technical data

Supply		
Supply voltage range		18 V DC ... 30 V DC (Screw connection)
Supply voltage range		18 V DC ... 30 V DC (as an alternative or redundant, via backplane bus contact and system current supply)
Nominal current consumption		< 110 mA (24 V DC)
FO interface		
Wavelength		1310 nm / 1550 nm
Transmission length Incl. 3 dB system reserve		38 km (With F-E 9/125 0.36 dB/km) 34 km (With F-E 9/125 0.4 dB/km) 28 km (With F-E 9/125 0.5 dB/km) 21 km (with F-G 62,5/125 0,7 dB/km F 1000) 5.5 km (with F-G 62.5/125 2.6 dB/km F 600) 21 km (with F-G 50/125 0,7 dB/km F 1200) 9 km (with F-G 50/125 1,6 dB/km F 800)
Signal LEDs		Far end fault (red LED), link status (yellow LED)
Ethernet interface		
Connection method		RJ45 socket, shielded
Transmission speed		10/100 Mbps
Auto-negotiation modes		Auto
Transmission length		100 m (shielded twisted pair)
Link through		Link fault pass through
MDI-/MDI-X switchover		Auto-MDI(X)
Signal LEDs		Activity, link status, 10/100 Mbps
General data		
Ambient temperature (operation)		-40 °C ... 65 °C
Electrical isolation		VCC // FE // Ethernet
Test voltage		1.5 kV_{rms} (50 Hz, 1 min.)
Dimensions	W / H / D	22.5 mm / 99 mm / 114.5 mm
Conformance/Approvals		
ATEX		II 3 G Ex nA IIC T4 Gc X
UL, USA/Canada		cULus listed UL 508 Class I, Zone 2, AEx nA IIC T4 Class I, Zone 2, Ex nA IIC T4 Gc X Class I, Div. 2, Groups A, B, C, D
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
FO converter, for converting 10/100 BASE-TX to a single-mode optical fiber, WDM technology			
WDM set with devices A and B, SC simplex connection	**FL MC EF WDM-SET SC**	2902660	1
WDM device A, SC simplex connection	**FL MC EF WDM-A SC**	2902658	1
WDM device B, SC simplex connection	**FL MC EF WDM-B SC**	2902659	1
FO converter, for converting 10/100 BASE-TX to multi-mode fiberglass (1300 nm) - Connection: SC duplex - Connection: B-FOC (ST®)			
FO converter, for converting 10/100 BASE-TX to single-mode fiberglass (1300 nm) - Connection: SC duplex			
FO converter, for converting 100Base-T to polymer or PCF fiber (660 nm) - Connection: SC-RJ			

Universal devices with 1300 nm for multi-mode fiberglass

Universal device with 1300 nm for single-mode fiberglass

Universal device with 660 nm for polymer and PCF fibers

Ex:

Ex:

Technical data

18 V DC ... 30 V DC (Screw connection) 18 V DC ... 30 V DC (as an alternative or redundant, via backplane bus contact and system current supply)	18 V DC ... 30 V DC (Screw connection) 18 V DC ... 30 V DC (as an alternative or redundant, via backplane bus contact and system current supply)	18 V DC ... 30 V DC (via plug-in COMBICON screw terminal block) 23 V DC ... 25 V DC (as an alternative or redundant, via backplane bus contact and system current supply)
< 100 mA (24 V DC)	< 100 mA (24 V DC)	≤ 100 mA (24 V DC)
1300 nm 6.4 km (with F-G 50/125 0,7 dB/km F 1000) 2.8 km (with F-G 50/125 1,6 dB/km F 800) 10 km (with F-G 62,5/125 0,7 dB/km F 1000) 3 km (with F-G 62.5/125 2.6 dB/km F 600)	1300 nm 36 km (With F-E 9/125 0.36 dB/km) 32 km (With F-E 9/125 0.4 dB/km) 26 km (With F-E 9/125 0.5 dB/km)	660 nm 50 m (Polymer fiber with F-P 980/1000 230 dB/km) 100 m (PCF fiber with F-K 200/230 8 dB/km)
Far end fault (red LED), link status (yellow LED)	Far end fault (red LED), link status (yellow LED)	Optical receiver power: Very good (green), good (green), critical (yellow), fault (red)
RJ45 socket, shielded 10/100 Mbps Auto 100 m (shielded twisted pair) Link fault pass through Auto-MDI(X) Activity, link status, 10/100 Mbps	RJ45 socket, shielded 10/100 Mbps Auto 100 m (shielded twisted pair) Link fault pass through Auto-MDI(X) Activity, link status, 10/100 Mbps	RJ45 socket, shielded 100 Mbps - 100 m (shielded twisted pair) Link fault pass through Auto-MDI(X) Activity (yellow), link status (green, UL flashing), 100 Mbps (green)
-40 °C ... 65 °C VCC // FE // Ethernet 1.5 kV_{rms} (50 Hz, 1 min.) 22.5 mm / 99 mm / 114.5 mm	-40 °C ... 65 °C VCC // FE // Ethernet 1.5 kV_{rms} (50 Hz, 1 min.) 22.5 mm / 99 mm / 114.5 mm	-40 °C ... 60 °C VCC // Ethernet 1.5 kV_{rms} (50 Hz, 1 min.) 22.5 mm / 99 mm / 114.5 mm
II 3 G Ex nA IIC T4 Gc X II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U) II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U) cULus listed UL 508 Class I, Zone 2, AEx nA IIC T4 Class I, Zone 2, Ex nA IIC T4 Gc X Class I, Div. 2, Groups A, B, C, D Class A product, see page 525	II 3 G Ex nA IIC T4 Gc X cULus listed UL 508 Class I, Zone 2, AEx nA IIC T4 Class I, Zone 2, Ex nA IIC T4 Gc X Class I, Div. 2, Groups A, B, C, D Class A product, see page 525	- -

Ordering data

Type	Order No.	Pcs./Pkt.
FL MC EF 1300 MM SC	2902853	1
FL MC EF 1300 MM ST	2902854	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL MC EF 1300 SM SC	2902856	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL MC EF 660 SCRJ	2702944	1

Media converters

The class 1000 and 2000 media converters offer a robust design in metal housing. From the basic version to use in energy applications, they meet a wide range of different requirements.

General features

– 1300 nm wavelength
– Connection monitoring with LFPT (link fault pass through)
– Signal LEDs for activity, link status, 10/100 Mbps
– Robust design in metal housing for high EMC requirements

Devices for basic requirements

The **FL MC 1000...** media converters offer an easy and inexpensive entry-level solution for converting to FO technology.

Features:

– Multimode fiberglass cables
– B-FOC (ST®) or SC duplex
– Auto negotiation and auto MDI/MDIx

Devices for realtime applications

Thanks to their short delay times (latency), the **FL MC 2000T...** media converters are suitable for applications with realtime Ethernet protocols.

Features:

– Store-and-forward or pass-through mode can be selected via DIP switch (low latency, 835 ns)
– Multimode or single-mode fiberglass cable
– B-FOC (ST®) or SC duplex
– Extended temperature range (-40 °C ... +75 °C)

Devices for harsh requirements

The **FL MC 2000E...** media converters are designed for use in energy technology. Thanks to their robust design, they are used in environments subject to high levels of EMI around switchgear.

Features:

– Multimode or single-mode fiberglass cable
– LC duplex connection
– IEC 61850 and IEEE 1613
– Extended temperature range (-40 °C ... +75 °C)
– Redundant power supply with a wide range from 12 ... 57 V DC (24, 36, 48 V DC)

Basic requirements, multi-mode fiberglass

Ex:

Technical data

Supply		
Supply voltage range		12 V DC ... 48 V DC
Nominal current consumption		73 mA (24 V DC)
FO interface		
Wavelength		1310 nm
Transmission length Incl. 3 dB system reserve		8 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000) 3.3 km (fiberglass with F-G 62.5/125 2.6 dB/km F600) 9.6 km (fiberglass with F-G 50/125 0.7 dB/km F1200) 5.3 km (fiberglass with F-G 50/125 1.6 dB/km F800)
Signal LEDs		LNK/ACT
Ethernet interface		
Connection method		RJ45 socket, shielded
Transmission speed		10/100 Mbps
Auto-negotiation modes		Auto
Link through		Link fault pass through
MDI-/MDI-X switchover		Auto-MDI(X)
Signal LEDs		LNK/ACT, 100
Switching output		
Contact type		-
Max. switching voltage		-
General data		
Ambient temperature (operation)		0 °C ... 60 °C
Electrical isolation		VCC // FE // Ethernet
Test voltage		500 V DC
Dimensions	W / H / D	28 mm / 110 mm / 70 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
FO converter, for converting 10/100 BASE-TX to multi-mode fiberglass (1300 nm) - Connection: SC duplex - Connection: B-FOC (ST®) - Connection: LC duplex	**FL MC 1000 SC** **FL MC 1000 ST**	2891320 2891321	1 1
FO converter, for converting 10/100 BASE-TX to single-mode fiberglass (1300 nm) - Connection: SC duplex - Connection: SC duplex - Connection: LC duplex			

Realtime protocols, multi-mode fiberglass

Realtime protocols, single-mode fiberglass

IEC 61850-3

Harsh ambient conditions, IEC 61850

Ex:

Ex:

Ex:

Technical data

12 V DC ... 48 V DC 110 mA (24 V DC)	
1310 nm 8 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000) 3.3 km (fiberglass with F-G 62.5/125 2.6 dB/km F600) 9.6 km (fiberglass with F-G 50/125 0.7 dB/km F1200) 5.3 km (fiberglass with F-G 50/125 1.6 dB/km F800)	
LNK/ACT	
RJ45 socket, shielded 10/100 Mbps Auto Link fault pass through Auto-MDI(X) LNK/ACT, 100	
1 x N/C contact ≤ 250 V AC	
-40 °C ... 75 °C VCC // FE // Ethernet 500 V DC 28 mm / 110 mm / 70 mm Class A product, see page 525	

Technical data

FL MC 2000T SM20 SC	FL MC 2000T SM40 SC
12 V DC ... 48 V DC 110 mA (24 V DC)	
1310 nm	
20 km (fiberglass with F-G 9/125 0.36 dB/km)	40 km (fiberglass with F-G 9/125 0.36 dB/km) 36 km (fiberglass with F-G 9/125 0.4 dB/km) 29 km (fiberglass with F-G 9/125 0.5 dB/km)
LNK/ACT	
RJ45 socket, shielded 10/100 Mbps Auto Link fault pass through Auto-MDI(X) LNK/ACT, 100	
1 x N/C contact ≤ 250 V AC	
-40 °C ... 75 °C VCC // FE // Ethernet 500 V DC 28 mm / 110 mm / 70 mm Class A product, see page 525	

Technical data

FL MC 2000E LC	FL MC 2000E SM40 LC
12 V DC ... 57 V DC 110 mA (24 V DC)	
1310 nm	
8 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000) 3.3 km (fiberglass with F-G 62.5/125 2.6 dB/km F600) 9.6 km (fiberglass with F-G 50/125 0.7 dB/km F1200) 5.3 km (fiberglass with F-G 50/125 1.6 dB/km F800)	40 km (fiberglass with F-G 9/125 0.36 dB/km) 36 km (fiberglass with F-G 9/125 0.4 dB/km) 29 km (fiberglass with F-G 9/125 0.5 dB/km)
LNK/ACT	
RJ45 socket, shielded 100 Mbps Link fault pass through Auto-MDI(X) LNK/ACT, 100	
1 x N/C contact ≤ 250 V AC	
-40 °C ... 75 °C VCC // FE // Ethernet 500 V DC 30 mm / 130 mm / 100 mm Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL MC 2000T SC	2891315	1
FL MC 2000T ST	2891316	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL MC 2000T SM20 SC	2891317	1
FL MC 2000T SM40 SC	2891318	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL MC 2000E LC	2891056	1
FL MC 2000E SM40 LC	2891156	1

Device servers for converting serial interfaces

The **FL COMSERVER...232/422/485** products are used to integrate serial (RS-232)/RS-422/RS-485 interfaces into existing Ethernet networks. This provides an easy way of implementing functions such as cable replacement, network integration or a Modbus gateway.

Cable replacement

Two devices in combination tunnel serial connections via Ethernet, using either the TCP or UDP protocol.

Network integration

You can integrate automation devices such as controllers or frequency inverters into a network using corresponding programming and diagnostics software. COM diversion software creates a virtual COM port on the PC and transmits the data to the FL COMSERVER.

Modbus gateway

The integrated Modbus gateway function provided in FL COMSERVER UNI converts serial Modbus ASCII or RTU data into Modbus TCP. Naturally, the conversion process also works in the opposite direction.

Features common to all devices:

– Serial interfaces: RS-232, RS-422, RS-485
– 10/100 Base-T(X) interface
– Software for virtual COM ports supplied as standard
– Extended temperature range of -25°C to +60°C
– Redundant power supply and modular station configuration with DIN rail connectors
– 3-way electrical isolation VCC // (RS-232)/RS-422/RS-485 // network
– Integration into network management tools and visualization systems with the support of SNMP services
– LED diagnostic indicators
– Configuration via web-based management

FL COMSERVER UNI...

– Supports TCP, UDP, Modbus TCP/RTU/ASCII
– Can be used exactly as required on Modbus master or slave

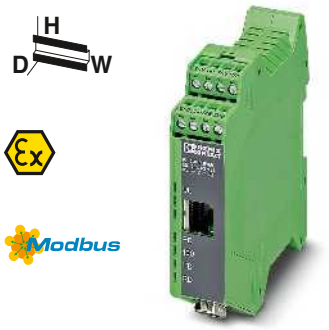
FL COMSERVER BASIC...

– Best-value version
– Supports TCP and UDP

Supply	
Supply voltage range	
Supply voltage range	
Nominal current consumption	
Serial port	
Interfaces	
Connection method	RS-232 RS-422 RS-485
Data format/coding	
Data flow control/protocols	
Transmission speed	
Termination resistor	
Ethernet interface	
Connection method	
Transmission speed	
Transmission length	
Supported protocols	
Auxiliary protocols	
Functions	
Management	
General data	
Ambient temperature (operation)	
Electrical isolation	
Test voltage	
Electromagnetic compatibility	
Dimensions	W / H / D
Conformance/Approvals	
UL, USA/Canada	
EMC note	

Description
FL COMSERVER...232/422/485, for converting serial interfaces to Ethernet. COM port redirector software and additional software supplied as standard
TCP, UDP, Modbus, PPP
TCP, UDP

RS-232-D-SUB cable, length: 2 m
- 9-pos. socket on 9-pos. socket
- 9-pos. socket on 25-pos. socket
DIN rail connector
System power supply, primary-switched



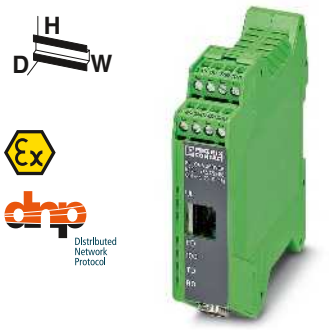
Universal device - Modbus gateway between RTU/ASCII and TCP

Ex:

Technical data	
Supply	19.2 V AC/DC ... 28.8 V AC/DC (via plug-in COMBICON screw terminal block) 22.8 V DC ... 25.2 V DC (as an alternative or redundant, via backplane bus contact and system current supply)
Current consumption	100 mA (24 V DC)
Interface 1	RS-232 , RS-422 , RS-485 D-SUB 9 connector Plug-in/screw connection via COMBICON Plug-in/screw connection via COMBICON UART/NRZ: 7/8 bit Data, 1/2 bit Stopp, None/Even/Odd Parity
Protocol	Software handshake, Xon/Xoff, or hardware handshake RTS/CTS // 3964 R compatible, Modbus RTU/ASCII
Transmission speed	0.3; 0.6; 1.2; 2.4; 4.8; 7.2; 9.6; 19.2; 38.4; 57.6; 115.2; 187.5; 230.4 kbps 390 Ω / 180 Ω / 390 Ω (configurable)
Interface 2	RJ45 socket, shielded 10/100 Mbps, auto negotiation ≤ 100 m (shielded twisted pair) TCP/IP, UDP, Modbus (TCP, RTU/ASCII), PPP ARP, DHCP, BOOTP, SNMP, RIP, RARP, HTTP, TFTP
Configuration	Web-based management, SNMP, emergency exit with Telnet and serial
Ambient conditions	-25 °C ... 60 °C
Electrical isolation	DIN EN 50178 (VCC // Ethernet // Serial) 1.5 kV_{rms} (50 Hz, 1 min.) Conformance with EMC Directive 2014/30/EU
Dimensions	22.5 mm / 99 mm / 116 mm
Approvals	508 listed Class I, Div. 2, Groups A, B, C, D Class A product, see page 525

Ordering data		
Type	**Order No.**	Pcs./Pkt.
FL COMSERVER UNI 232/422/485	2313452	1

Accessories		
PSM-KA9SUB9/BB/2METER	2799474	1
PSM-KA 9 SUB 25/BB/2METER	2761059	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	2707437	50
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



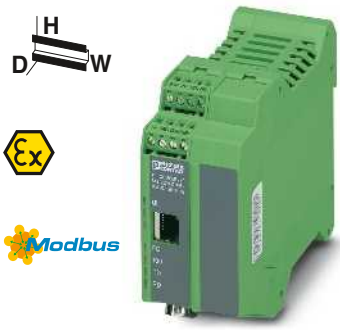
Basic version for redirector operation - TCP and UDP

Ex:

Technical data	
Supply	19.2 V AC/DC ... 28.8 V AC/DC (via plug-in COMBICON screw terminal block) 22.8 V DC ... 25.2 V DC (as an alternative or redundant, via backplane bus contact and system current supply)
Current consumption	100 mA (24 V DC)
Interface 1	RS-232 , RS-422 , RS-485 D-SUB 9 connector Plug-in/screw connection via COMBICON Plug-in/screw connection via COMBICON UART/NRZ: 7/8 bit Data, 1/2 bit Stopp, None/Even/Odd Parity
Protocol	Software handshake, Xon/Xoff or hardware handshake RTS/CTS
Transmission speed	0.3; 0.6; 1.2; 2.4; 4.8; 7.2; 9.6; 19.2; 38.4; 57.6; 115.2; 187.5; 230.4 kbps 390 Ω / 180 Ω / 390 Ω
Interface 2	RJ45 socket, shielded 10/100 Mbps, auto negotiation ≤ 100 m (shielded twisted pair) TCP/IP, UDP ARP, DHCP, BOOTP, SNMP, RIP, RARP, HTTP, TFTP
Configuration	Web-based management, SNMP, emergency exit with Telnet and serial
Ambient conditions	-25 °C ... 60 °C
Electrical isolation	DIN EN 50178 (VCC // Ethernet // Serial) 1.5 kV_{rms} (50 Hz, 1 min.) Conformance with EMC Directive 2014/30/EU
Dimensions	22.5 mm / 99 mm / 116 mm
Approvals	508 listed Class I, Div. 2, Groups A, B, C, D Class A product, see page 525

Ordering data		
Type	**Order No.**	Pcs./Pkt.
FL COMSERVER BASIC 232/422/485	2313478	1

Accessories		
PSM-KA9SUB9/BB/2METER	2799474	1
PSM-KA 9 SUB 25/BB/2METER	2761059	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	2707437	50
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



With extended temperature and supply voltage range

Ex:

Technical data	
Supply	12 V AC/DC ... 30 V AC/DC (observe derating)
Current consumption	-
Interface 1	RS-232 , RS-422 , RS-485 D-SUB 9 connector Plug-in/screw connection via COMBICON Plug-in/screw connection via COMBICON UART/NRZ: 7/8 bit Data, 1/2 bit Stopp, None/Even/Odd Parity
Protocol	Software handshake, Xon/Xoff, or hardware handshake RTS/CTS // 3964 R compatible, Modbus RTU/ASCII
Transmission speed	0.3; 0.6; 1.2; 2.4; 4.8; 7.2; 9.6; 19.2; 38.4; 57.6; 115.2; 187.5; 230.4 kbps 390 Ω / 180 Ω / 390 Ω (configurable)
Interface 2	RJ45 socket, shielded 10/100 Mbps, auto negotiation ≤ 100 m (shielded twisted pair) TCP/IP, UDP, Modbus (TCP, RTU/ASCII), PPP ARP, DHCP, BOOTP, SNMP, RIP, RARP, HTTP, TFTP
Configuration	Web-based management, SNMP, emergency exit with Telnet and serial
Ambient conditions	-40 °C ... 70 °C (free-standing, 40mm space on all sides)
Electrical isolation	DIN EN 50178 (VCC // Ethernet // Serial) 1.5 kV_{rms} (50 Hz, 1 min.) Conformance with EMC Directive 2014/30/EU
Dimensions	45 mm / 99 mm / 116 mm
Approvals	- Class A product, see page 525

Ordering data		
Type	**Order No.**	Pcs./Pkt.
FL COMSERVER UNI 232/422/485-T	2904817	1
FL COMSERVER BAS 232/422/485-T	2904681	1

Accessories		
PSM-KA9SUB9/BB/2METER	2799474	1
PSM-KA 9 SUB 25/BB/2METER	2761059	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	2707437	50
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1

Device servers and gateways for implementing serial protocols for Ethernet

The new device servers and gateways offer versions with multiple serial ports and Ethernet ports, as well as advanced security functions. That's why they are particularly suitable for sensitive industries such as energy supply, infrastructure or the process industry, where increased requirements are placed on Ethernet security.

Hardware

The serial device servers and gateways are available in different hardware versions:
– 1 x Ethernet and 1 x RS-232/422/485
– 1 x Ethernet and 2 x RS-232/422/485
– 2 x Ethernet and 2 x RS-232/422/485
– 2 x Ethernet and 4 x RS-232/422/485

Functions:

Each hardware design is available in four different versions.

Device servers:
– Protocol-transparent transmission of serial data via Ethernet

Gateways:
– Converting Modbus/RTU to Modbus/TCP
– Converting any serial data (RAW/ASCII) to Modbus/TCP
– Converting any serial data (RAW/ASCII) to EtherNet/IP™

Features:

– 256-bit AES encryption with additional programmable, password-protected settings
– Easy installation and startup
– Web-based management
– Monitoring and diagnostics of serial ports
– Easy connection to a variety of serial devices with D-SUB connectors from the SUBCON range

new

Device servers for protocol-transparent transmission of serial data via Ethernet

Technical data

		GW DEVICE SERVER 1E/1DB9	GW DEVICE SERVER 2E/2DB9
Supply			
Supply voltage range		10.8 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	
Nominal current consumption		48 mA (24 V DC)	88 mA (24 V DC)
Serial port			
Interfaces		RS-232 , RS-422 , RS-485	
Connection method	RS-232	D-SUB 9 connector	
	RS-422	D-SUB 9 connector	
	RS-485	D-SUB 9 connector	
Data format/coding		5/6/7/8 Data bits, 1/2 Stop bits, None/Even/Odd/Mark/Space Parity	
Data flow control/protocols		Software handshake, Xon/Xoff or hardware handshake RTS/CTS	
Transmission speed		0.3; 0.6; 1.2; 2.4; 4.8; 9.6; 19.2; 38.4; 57.6; 115.2; 230.4 Kbps	
Termination resistor		120 Ω	
Ethernet interface			
Number of ports		1	2
Connection method		RJ45 socket, shielded	
Transmission speed		10/100 Mbps, auto negotiation	
Transmission length		≤ 100 m (shielded twisted pair)	
Supported protocols		TCP/IP, UDP, ASCII	
Auxiliary protocols		ARP, DHCP (Client), PING	
Functions			
Management		Web-based management	
General data			
Ambient temperature (operation)		-40 °C ... 70 °C	
Electrical isolation		IEC UL 61010-1 (VCC // Ethernet)	
Test voltage		1.5 kV_{rms} (50 Hz, 1 min.)	
Electromagnetic compatibility		Conformance with EMC Directive 2014/30/EU	
Dimensions	W / H / D	22.5 mm / 99 mm / 115 mm	45 mm / 99 mm / 115 mm
Conformance/Approvals			
UL, USA/Canada		Class I, Div. 2, Groups A, B, C, D	
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
- 1 x RJ45 / 1 x D-SUB 9	**GW DEVICE SERVER 1E/1DB9**	2702758	1
- 1 x RJ45 / 2 x D-SUB 9	**GW DEVICE SERVER 1E/2DB9**	2702760	1
- 2 x RJ45 / 2 x D-SUB 9	**GW DEVICE SERVER 2E/2DB9**	2702761	1
- 2 x RJ45 / 4 x D-SUB 9	**GW DEVICE SERVER 2E/4DB9**	2702763	1

Accessories

D-SUB connector, with screw connection - 9-pos., socket	**SUBCON 9/F-SH**	2761499	1
D-SUB connector, with **two** cable entries, **universal type**, pin assignment 1,2,3,4,5,6,7,8,9 on **every** screw terminal block - Axial, 9-pos., socket	**SUBCON-PLUS-F/AX 9**	2311797	1
Patch cable, CAT5, preassembled 5 m	**FL CAT5 PATCH 5,0**	2832580	10

new

Modbus gateways for converting Modbus/TCP to Modbus/RTU

new

Protocol converters for integrating any serial data into Modbus/TCP

new

Protocol converters for integrating any serial data into EtherNet/IP™

Technical data

GW MODBUS TCP/RTU 1E/1DB9	GW MODBUS TCP/RTU 2E/2DB9
10.8 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	
48 mA (24 V DC)	88 mA (24 V DC)
RS-232 , RS-422 , RS-485 D-SUB 9 connector D-SUB 9 connector D-SUB 9 connector 5/6/7/8 Data bits, 1/2 Stop bits, None/Even/Odd/Mark/Space Parity Software handshake, Xon/Xoff or hardware handshake RTS/CTS 0.3; 0.6; 1.2; 2.4; 4.8; 9.6; 19.2; 38.4; 57.6; 115.2; 230.4 Kbps 120 Ω	
1	2
RJ45 socket, shielded 10/100 Mbps, auto negotiation ≤ 100 m (shielded twisted pair) Modbus RTU, Modbus ASCII, Modbus TCP ARP, DHCP (Client), PING	
Web-based management	
-40 °C ... 70 °C IEC UL 61010-1 (VCC // Ethernet) 1.5 kV_{rms} (50 Hz, 1 min.) Conformance with EMC Directive 2014/30/EU	
22.5 mm / 99 mm / 115 mm	45 mm / 99 mm / 115 mm
Class I, Div. 2, Groups A, B, C, D	

Ordering data

Type	Order No.	Pcs./Pkt.
GW MODBUS TCP/RTU 1E/1DB9	**2702764**	1
GW MODBUS TCP/RTU 1E/2DB9	**2702765**	1
GW MODBUS TCP/RTU 2E/2DB9	**2702766**	1
GW MODBUS TCP/RTU 2E/4DB9	**2702767**	1

Accessories

SUBCON 9/F-SH	**2761499**	1
SUBCON-PLUS-F/AX 9	**2311797**	1
FL CAT5 PATCH 5,0	**2832580**	10

Technical data

GW MODBUS TCP/ASCII 1E/1DB9	GW MODBUS TCP/ASCII 2E/2DB9
10.8 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	
48 mA (24 V DC)	88 mA (24 V DC)
RS-232 , RS-422 , RS-485 D-SUB 9 connector D-SUB 9 connector D-SUB 9 connector 5/6/7/8 Data bits, 1/2 Stop bits, None/Even/Odd/Mark/Space Parity Software handshake, Xon/Xoff or hardware handshake RTS/CTS 0.3; 0.6; 1.2; 2.4; 4.8; 9.6; 19.2; 38.4; 57.6; 115.2; 230.4 Kbps 120 Ω	
1	2
RJ45 socket, shielded 10/100 Mbps, auto negotiation ≤ 100 m (shielded twisted pair) ARP, DHCP (Client), PING	
Web-based management	
-40 °C ... 70 °C IEC UL 61010-1 (VCC // Ethernet) 1.5 kV_{rms} (50 Hz, 1 min.) Conformance with EMC Directive 2014/30/EU	
22.5 mm / 99 mm / 115 mm	45 mm / 99 mm / 115 mm
Class I, Div. 2, Groups A, B, C, D Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
GW MODBUS TCP/ASCII 1E/1DB9	**2702768**	1
GW MODBUS TCP/ASCII 1E/2DB9	**2702769**	1
GW MODBUS TCP/ASCII 2E/2DB9	**2702770**	1
GW MODBUS TCP/ASCII 2E/4DB9	**2702771**	1

Accessories

SUBCON 9/F-SH	**2761499**	1
SUBCON-PLUS-F/AX 9	**2311797**	1
FL CAT5 PATCH 5,0	**2832580**	10

Technical data

GW EIP/ASCII 1E/1DB9	GW EIP/ASCII 2E/2DB9
10.8 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	
48 mA (24 V DC)	88 mA (24 V DC)
RS-232 , RS-422 , RS-485 D-SUB 9 connector D-SUB 9 connector D-SUB 9 connector 5/6/7/8 Data bits, 1/2 Stop bits, None/Even/Odd/Mark/Space Parity Software handshake, Xon/Xoff or hardware handshake RTS/CTS 0.3; 0.6; 1.2; 2.4; 4.8; 9.6; 19.2; 38.4; 57.6; 115.2; 230.4 Kbps 120 Ω	
1	2
RJ45 socket, shielded 10/100 Mbps, auto negotiation ≤ 100 m (shielded twisted pair) EtherNet/IP, ASCII ARP, DHCP (Client), PING	
Web-based management	
-40 °C ... 70 °C IEC UL 61010-1 (VCC // Ethernet) 1.5 kV_{rms} (50 Hz, 1 min.) Conformance with EMC Directive 2014/30/EU	
22.5 mm / 99 mm / 115 mm	45 mm / 99 mm / 115 mm
Class I, Div. 2, Groups A, B, C, D	

Ordering data

Type	Order No.	Pcs./Pkt.
GW EIP/ASCII 1E/1DB9	**2702772**	1
GW EIP/ASCII 1E/2DB9	**2702773**	1
GW EIP/ASCII 2E/2DB9	**2702774**	1
GW EIP/ASCII 2E/4DB9	**2702776**	1

Accessories

SUBCON 9/F-SH	**2761499**	1
SUBCON-PLUS-F/AX 9	**2311797**	1
FL CAT5 PATCH 5,0	**2832580**	10

4 kV Ethernet ISOLATOR for electrical isolation

The **FL ISOLATOR** is used for electrical isolation in copper-based Ethernet networks.

In industrial environments, potential differences pose a constant problem with regard to interference-free data transmission.

The high-quality isolation for up to 4 kV provides reliable protection for Ethernet devices and interfaces. This results in considerably higher immunity to interference in industrial applications.

The **FL ISOLATOR 100-M12** has been specifically developed for use in the railway industry. Featuring M12 connection technology and optional wall mounting, this network isolator can be used flexibly.

Features:

– Electrical isolation of data cables and cable shielding
– Dielectric strength up to 4 kV
– Transmission speed of up to 1000 Mbps, device-specific
– No power supply required
– Protection against aggressive environmental influences, particularly harsh industrial environments, thanks to coated PCB
– Approval for railway applications (rolling stock) according to EN 50155 and EN 50121
– Extended temperature range

Transmission speeds up to 1 Gbps, two RJ45 connections

Technical data

Ethernet interface		
Connection method		RJ45 socket, shielded
Transmission speed		10/100/1000 Mbps
Transmission length		≤ 100 m (Total length across both ports (dependent on data rate and cable used))
General data		
Ambient temperature (operation)		-25 °C ... 75 °C
Electrical isolation		Ethernet // Ethernet
Test voltage		4 kV AC (50 Hz, 1 min.)
Electromagnetic compatibility		Conformance with EMC Directive 2014/30/EU
Standards/regulations		EN 50121 and EN 50155 (for railway applications)
Dimensions	W / H / D	22.5 mm / 99 mm / 92 mm
Conformance/Approvals		
UL, USA/Canada		508 listed
EMC note		

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Passive network isolator, for electrical isolation in Ethernet networks. For protection against potential differences of up to 4 kV. - For transmission speeds of up to 1 Gbps, connection: 2x RJ45 sockets - For transmission speeds of up to 100 Mbps, connection: 2x RJ45 sockets - For transmission speeds of up to 100 Mbps, connection: 1x RJ45 socket and COMBICON connector screw terminal block	**FL ISOLATOR 1000-RJ/RJ**	2313915	1
Passive network isolator, for electrical isolation in Ethernet networks. For protection against potential differences of up to 4 kV. - For transmission speeds of up to 100 Mbps, connection: two M12 sockets (D-coded) - With pre-installed adapter for mounting on a DIN rail			

Transmission speeds up to 100 Mbps, two RJ45 connections

Transmission speeds up to 100 Mbps, RJ45 and screw connection

Transmission speeds up to 100 Mbps, M12 connection

Technical data

	RJ45 socket, shielded 10/100 Mbps ≤ 100 m (Total length across both ports (dependent on data rate and cable used))
	-25 °C ... 75 °C
	Ethernet // Ethernet 4 kV AC (50 Hz, 1 min.) Conformance with EMC Directive 2014/30/EU EN 50121 and EN 50155 (for railway applications)
	22.5 mm / 99 mm / 92 mm
	508 listed

Ordering data

Type	Order No.	Pcs./Pkt.
FL ISOLATOR 100-RJ/RJ	2313931	1

Technical data

	RJ45 socket, shielded 10/100 Mbps ≤ 100 m (Total length across both ports (dependent on data rate and cable used))
	-25 °C ... 75 °C
	Ethernet // Ethernet 4 kV AC (50 Hz, 1 min.) Conformance with EMC Directive 2014/30/EU EN 50121 and EN 50155 (for railway applications)
	22.5 mm / 99 mm / 92 mm
	508 listed

Ordering data

Type	Order No.	Pcs./Pkt.
FL ISOLATOR 100-RJ/SC	2313928	1

Technical data

	M 12 connectors (D-coded, female) 10/100 Mbps ≤ 100 m (Total length across both ports (dependent on data rate and cable used))
	-40 °C ... 75 °C (85°C for 10 min.; thereafter function can no longer be guaranteed - check device)
	Port X1//port X2 4 kV AC (50 Hz, 1 min.) Conformance with EMC Directive 2014/30/EU EN 50121 and EN 50155 (for railway applications) , IEC 60571 , DIN EN 50153
	66 mm / 91 mm / 34 mm
	- Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FL ISOLATOR 100-M12	2902985	1
FL ISOLATOR 100-M12 RMS	2904671	1

Passive patch panel for the DIN rail

The mini patch panels provide a convenient alternative to on-site assembly of RJ45 connectors.

The cross-control-cabinet field cabling is simply connected to screw, spring-cage or LSA connection terminal blocks, depending on which option is selected. The connection to the terminal devices is then established using pre-assembled RJ45 patch cables.

General features

– CAT5e
– 10/100/1000 Mbps
– Mounted on DIN rails
– Safe shield connection to ground potential

FL CAT 5 TERMINAL BOX

– Screw terminal blocks
– 4-pin assignment: 1, 2, 3, 6
– Clearly labeled with PROFINET cable colors

FL-PP-RJ45-...

– Spring connection terminal blocks
– Screw terminal blocks
– LSA connection terminal blocks
– 8-pin assignment: 1:1
– Option of shield contacting on DIN rail directly or via RC element with jumper

FL-PP-RJ45/RJ45

– Two RJ45 sockets
– 8-pin assignment: 1:1
– Version B as basic version with compact design and extended temperature range

FL-PP-RJ45-SCC/...

– Y-splitter for transmission of two individual network connections with 10/100 Mbps or phone line via a CAT cable with eight wires
– Spring connection terminal blocks
– Option of shield contacting on DIN rail directly or via RC element with jumper

Notes:

Mini patch panel with electrical isolation, see page 344

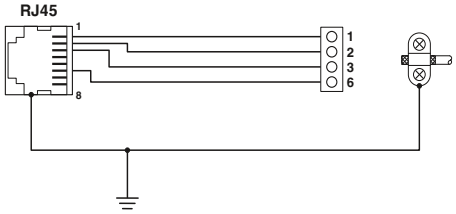
1 x RJ45 to four connection terminal blocks, up to 100 Mbps

Technical data

General data	
Cable impedance	100 Ω
Transmission speed	10/100 Mbps
Connection line	twisted pair, shielded, CAT5 or better
Transmission length	100 m (including patch cables)
Plug-in connection	RJ45 CAT5e
Insertion/withdrawal cycles	≤ 2500
Cable cross section (max./min.)	10 mm / 6 mm
Screw connection solid/stranded/AWG	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
Ambient temperature (operation)	-25 °C ... 70 °C
Dimensions W / H / D	25 mm / 90 mm / 52 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Patch panel, one **RJ45 socket to 4 screw connection terminal blocks** (assignment 1, 2, 3, 6), CAT5, 10/100 Mbps, DIN rail mounting, IP20, shield contacting on DIN rail	**FL CAT5 TERMINAL BOX**	2744610	10
Patch panel, one **RJ45 socket to 8 connection terminal blocks** (1:1 assignment), CAT5e, 10/100/1000 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers - RJ45 to spring connection terminal blocks - RJ45 to screw connection terminal blocks - RJ45 to LSA connection terminal blocks (without ATEX approval)			
Patch panel, two RJ45 sockets (1:1 assignment), CAT5, 10/100/1000 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers			
Patch panel, two RJ45 sockets (1:1 assignment), **extended temperature range,** CAT5, 10/100 Mbps, DIN rail mounting, IP20, consistent shield, width 22.5 mm - without ATEX approval			
Cable sharing module, two RJ45 sockets with Ethernet assignment, to 8 spring-cage connection terminal blocks, CAT5e, 10/100 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers - Cable outlet at the front, width 52 mm - Cable outlet at the top, width 56 mm			



1 x RJ45 to eight connection terminal blocks, up to 1000 Mbps

2x RJ45

2 x RJ45 to eight connection terminal blocks, Y-splitter

Technical data

100 Ω	
10/100/1000 Mbps	
twisted pair, shielded, CAT5 or better	
100 m (including patch cables)	
RJ45 CAT5e	
≤ 2500	
10 mm / 6 mm	
0.2 - 1.5 mm² / 0.2 - 1 mm² / 24 - 16	
-25 °C ... 70 °C	
29 mm / 90 mm / 53 mm	

Technical data

	FL-PP-RJ45/RJ45	FL-PP-RJ45/RJ45-B
	100 Ω	
	10/100/1000 Mbps	10/100 Mbps
	twisted pair, shielded, CAT5 or better	
	100 m (including patch cables)	
	RJ45 CAT5e	RJ45 CAT5
	≤ 2500	
	-25 °C ... 70 °C	-40 °C ... 85 °C
	29 mm / 90 mm / 53 mm	22.5 mm / 78 mm / 44 mm

Technical data

	FL-PP-RJ45-SCC/SC041	FL-PP-RJ45-SCC/SC045
	100 Ω	
	10/100 Mbps	
	twisted pair, shielded, CAT5 or better	
	100 m (including patch cables)	
	RJ45 CAT5e	
	≤ 750	≤ 200
	10 mm / 6 mm	
	0.2 - 1.5 mm² / 0.2 - 1 mm² / 24 - 16	
	-10 °C ... 50 °C	
	52 mm / 90 mm / 51 mm	56 mm / 90 mm / 51 mm

Ordering data

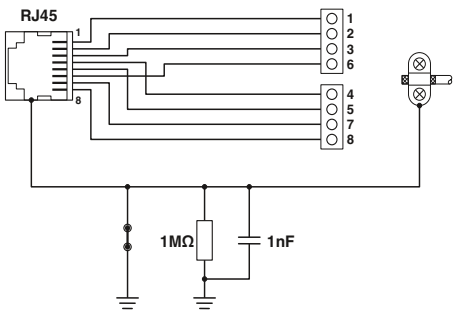
Type	Order No.	Pcs./Pkt.
FL-PP-RJ45-SCC	2901642	10
FL-PP-RJ45-SC	2901643	10
FL-PP-RJ45-LSA	2901645	10

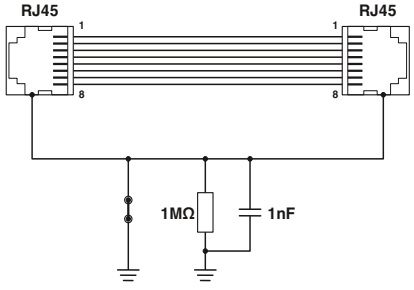
Ordering data

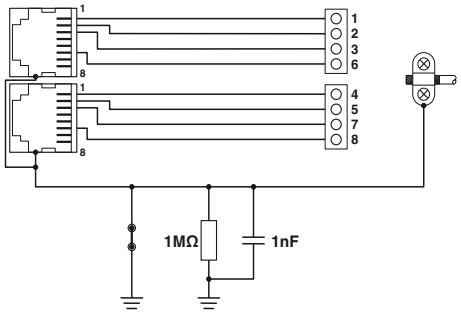
Type	Order No.	Pcs./Pkt.
FL-PP-RJ45/RJ45	2901646	10
FL-PP-RJ45/RJ45-B	2904933	10

Ordering data

Type	Order No.	Pcs./Pkt.
FL-PP-RJ45-SCC/SC041	2903532	1
FL-PP-RJ45-SCC/SC045	2904577	1







Alarm generation – remote signaling and remote control system

Alarm and remote control via the mobile phone network

Use the mobile phone network, monitor analog and digital values, and switch relays remotely using the TC mobile I/O product range.

Depending on the product version, data is transmitted via SMS, e-mail or ODP protocol (GPRS).

Thanks to the large voltage range and the different inputs, the signaling system is suitable for use in a wide range of applications.

Features:

- Event-controlled or continual communication
- 4 digital inputs
- DC version: 2 analog inputs (current/voltage)
- 4 relay outputs, switchable via mobile phone
- Alarming in case of voltage failure via SMS
- Configuration via USB and web browser
- Standard SIM card
- Compact design: 4 pitches (DIN 43880)
- Cover can be sealed
- Numerous helpful software functions

Applications:

- Machine, building and system monitoring
- Pumps, sewage treatment plants, water supply
- Light controllers, remote switching systems
- Lifts, doors
- Alarm and domestic engineering
- Climate and ventilation engineering
- Battery monitoring up to 60 V
- Railway applications according to EN 50121-4

TC Mobile I/O app

Switch your outputs conveniently using the app. This means you can check the status of your device at any time. The TC Mobile I/O app makes handling the SMS version even easier. The alarms are sent as usual via SMS and e-mail. This makes it easy to be contacted in the field.

Communication via SMS and e-mail, switching via app, 2 additional analog inputs

Technical data

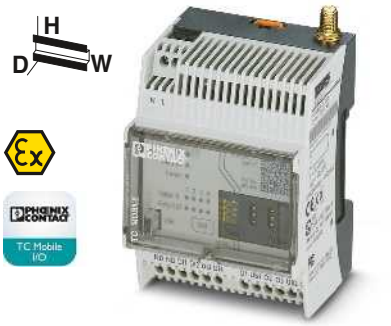
Supply		
Supply voltage range		10 V DC ... 60 V DC
Nominal current consumption		50 mA (24 V DC)
Max. current consumption		80 mA
USB interface		USB 2.0
Connection method		Mini-USB type B, 5-pos.
Transmission length		≤ 3 m (only for configuration and diagnostics)
Mobile phone network		
Frequencies		850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM))
Digital input		
Number of inputs		4
Analog input		
Number of inputs		2
Signal range		0 V DC ... 60 V DC / 0 mA ... 20 mA / 4 mA ... 20 mA (configurable)
Resolution		15 bit
Accuracy		± 0.1 %
Switching output		
Contact type		4 x N/O contact
Max. switching voltage		60 V
Limiting continuous current		6 A
General data		
Ambient temperature (operation)		-25 °C ... 70 °C (for derating, see technical documentation)
Approvals for countries		EU, other countries in preparation
Electromagnetic compatibility		Conformance with EMC Directive 2014/30/EU
Dimensions	W / H / D	72 mm / 90 mm / 62 mm
ATEX		II 3 G Ex nA nC IIC T4 Gc X
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Compact signaling system, for mobile phone networks, monitors inputs, switches relay outputs - Analog and digital inputs - Digital inputs	**TC MOBILE I/O X200**	2903805	1

Accessories

Multiband antenna for UMTS and quad band GSM, with omnidirectional characteristic, 2 m antenna cable with SMA round connector, degree of protection: IP65, dimensions: 76 x 20 mm	**PSI-GSM/UMTS-QB-ANT**	2313371	1
Multiband mobile communication antenna, with mounting bracket for outdoor installation, 5 m antenna cable with SMA circular connector, dimensions: 82 mm x 48 mm	**TC ANT MOBILE WALL 5M**	2702273	1
Mobile communication antenna, for direct assembly on the device, SMA circular connector with articulated joint	**PSI-GSM-STUB-ANT**	2313342	1
Antenna extension cable for UMTS and quad-band GSM, with SMA plug and SMA coupling, 5 m long	**PSI-CAB-GSM/UMTS- 5M**	2900980	1
Antenna extension cable for UMTS and quad-band GSM, with SMA plug and SMA coupling, 10 m long	**PSI-CAB-GSM/UMTS-10M**	2900981	1
Power supply, primary-switched	**STEP-PS/ 1AC/24DC/0.75**	2868635	1
USB connecting cable (individual) for configuration	**CABLE-USB/MINI-USB-3,0M**	2986135	1
Surge protection for UMTS and quad-band GSM antenna, with SMA plug and SMA coupling	**CSMA-LAMBDA/4-2.0-BS-SET**	2800491	1



Communication via SMS and e-mail, switching via app, with wide-range power supply

Communication via ODP protocol, 2 additional analog inputs

Communication via ODP protocol, with wide range power supply

Technical data

93 V AC ... 250 V AC (47.5 Hz ... 63 Hz)	10 V DC ... 60 V DC
15 mA (230 V AC)	140 mA (24 V DC)
25 mA	180 mA
USB 2.0	USB 2.0
Mini-USB type B, 5-pos.	Mini-USB type B, 5-pos.
≤ 3 m (only for configuration and diagnostics)	≤ 3 m (only for configuration and diagnostics)
850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM))	850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM))
4	4
-	2
-	0 V DC ... 60 V DC / 0 mA ... 20 mA / 4 mA ... 20 mA (configurable)
-	15 bit
-	± 0.1 %
4 x N/O contact	4 x N/O contact
250 V AC	60 V
5 A	6 A
-25 °C ... 70 °C (for derating, see technical documentation)	-25 °C ... 70 °C (for derating, see technical documentation)
EU, other countries in preparation	EU, other countries in preparation
Conformance with EMC Directive 2014/30/EU	Conformance with EMC Directive 2014/30/EU
72 mm / 90 mm / 62 mm	72 mm / 90 mm / 62 mm
II 3 G Ex nA nC IIC T4 Gc X	II 3 G Ex nA nC IIC T4 Gc X
Class A product, see page 525	Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
TC MOBILE I/O X200 AC	**2903806**	1

Accessories

PSI-GSM/UMTS-QB-ANT	**2313371**	1
TC ANT MOBILE WALL 5M	**2702273**	1
PSI-GSM-STUB-ANT	**2313342**	1
PSI-CAB-GSM/UMTS- 5M	**2900980**	1
PSI-CAB-GSM/UMTS-10M	**2900981**	1
STEP-PS/ 1AC/24DC/0.75	**2868635**	1
CABLE-USB/MINI-USB-3,0M	**2986135**	1
CSMA-LAMBDA/4-2.0-BS-SET	**2800491**	1

Ordering data

Type	Order No.	Pcs./Pkt.
TC MOBILE I/O X300	**2903807**	1

Accessories

PSI-GSM/UMTS-QB-ANT	**2313371**	1
TC ANT MOBILE WALL 5M	**2702273**	1
PSI-GSM-STUB-ANT	**2313342**	1
PSI-CAB-GSM/UMTS- 5M	**2900980**	1
PSI-CAB-GSM/UMTS-10M	**2900981**	1
STEP-PS/ 1AC/24DC/0.75	**2868635**	1
CABLE-USB/MINI-USB-3,0M	**2986135**	1
CSMA-LAMBDA/4-2.0-BS-SET	**2800491**	1

Ordering data

Type	Order No.	Pcs./Pkt.
TC MOBILE I/O X300 AC	**2903808**	1

Accessories

PSI-GSM/UMTS-QB-ANT	**2313371**	1
TC ANT MOBILE WALL 5M	**2702273**	1
PSI-GSM-STUB-ANT	**2313342**	1
PSI-CAB-GSM/UMTS- 5M	**2900980**	1
PSI-CAB-GSM/UMTS-10M	**2900981**	1
STEP-PS/ 1AC/24DC/0.75	**2868635**	1
CABLE-USB/MINI-USB-3,0M	**2986135**	1
CSMA-LAMBDA/4-2.0-BS-SET	**2800491**	1

Remote maintenance – mGuard security routers

The **TC MGUARD RS2/4000 VPN** security appliances are industrial mobile network routers with mGuard technology. As such, the routers offer a remote maintenance infrastructure for the secure connection of machines and systems via the Internet.

A high-speed mobile network interface and a 4-port switch are integrated into a compact metal housing. Secure remote communication on a global scale takes place via 4G LTE as well as UMTS and CDMA networks.

With the help of an SD card as a configuration memory, the devices can be quickly and easily started up or replaced. The devices have a buffered realtime clock and Trusted Platform Module (TPM) for secure key generation and management. They support precise time synchronization and positioning, specifically for mobile applications, via GPS and GLONASS.

The **TC MGUARD RS4000 3G** enables high-availability, high-end security for the industry. For maximum availability, an additional external network is supported redundantly alongside the internal network (LAN) and the external network (WAN) in the form of the mobile network interface. The integrated 4-port switch offers management features and supports EtherNet/IP™.

The **TC MGUARD RS2000 3G** devices are designed for applications with fewer complex requirements for secure remote maintenance. The integrated 4-port switch saves expensive space on the DIN rail.

Serial device server included

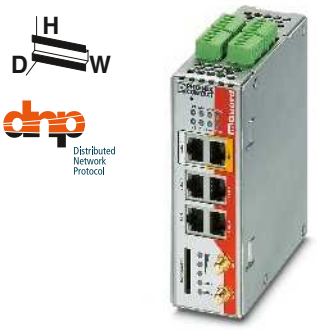
The integrated COMSERVER function is used to integrate serial RS-232 interfaces into Ethernet networks. This provides an easy way of implementing functions such as cable replacement or network integration.

Device Manager

The Device Manager simplifies the management of mGuard security appliances. The tool features a template mechanism that enables the user to configure and manage all mGuard devices centrally.

Notes:

Central device management software, the Device Manager for FL MGUARD devices, can be found on page 441



UMTS/HSPA mobile phone router with firewall and VPN, manageable 4-port switch, DMZ port and second WAN interface

Technical data

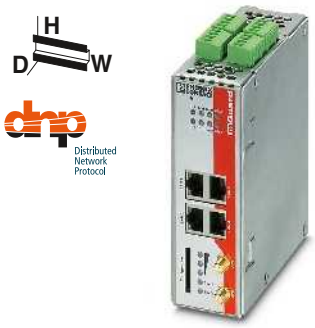
Supply		
Supply voltage range		11 V DC ... 36 V DC (via plug-in COMBICON screw terminal block)
Nominal current consumption		< 200 mA (24 V DC)
Ethernet interface		
Connection method		RJ45
Transmission speed		10/100 Mbps (auto negotiation)
Transmission length		100 m (shielded twisted pair)
Functions		
Management		Web-based management, SNMP
Basic functions		Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card
Security functions		
Number of VPN tunnels		10 (up to 250 tunnels with additional license as an option)
Encryption methods		DES, 3DES, AES-128, -192, -256
Internet Protocol Security (IPsec) mode		ESP tunnel / ESP transport
Authentication		X.509v3 certificates with RSA or PSK
Firewall rules		Configurable stateful inspection firewall with full scope of functions
Routing		Standard routing, NAT, 1:1-NAT, port forwarding
Mobile phone network		
Frequencies		850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM)) / 800 MHz (0.25 W (UMTS)) / 850 MHz (0.25 W (UMTS)) / 900 MHz (0.25 W (UMTS)) / 1900 MHz (0.25 W (UMTS)) / 2100 MHz (0.25 W (UMTS)) / 800 MHz (CDMA2000 EV-DO) / 1900 MHz (CDMA2000 EV-DO)
SIM interface		1.8 volt, 3 volt
GPRS compatibility		Class 12, Class B
Network check		LED bar graph to display receive quality
Antenna connection		50 Ω impedance SMA antenna socket
Digital input		
Number of inputs		3
Signal range		10 V DC ... 30 V DC / 5 mA
Digital output		
Number of outputs		3
Signal range		10 V DC ... 30 V DC (depending on the operating voltage) ≤ 250 mA (Short-circuit-proof)
General data		
Ambient temperature (operation)		-40 °C ... 60 °C
Electrical isolation		VCC // PE
Test voltage		1 kV (50 Hz, 1 min.)
Dimensions	W / H / D	45 mm / 130 mm / 114 mm
EMC note		Class A product, see page 525

Ordering data

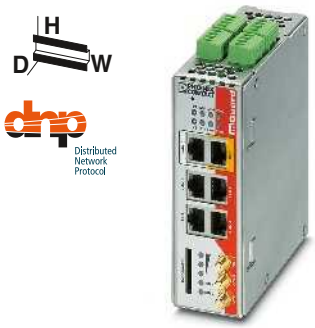
Description	Type	Order No.	Pcs./Pkt.
Mobile phone router with mGuard technology, VPN and firewall, replaceable memory, GPS time synchronization, serial device server for RS-232 - 2 x WAN interface (1 x RJ45, 1 x mobile phone technology), 4 x LAN interface (RJ45, manageable), DMZ port - 1 x WAN interface (mobile phone technology), 4 x LAN interface (RJ45)	**TC MGUARD RS4000 3G VPN**	2903440	1

Accessories

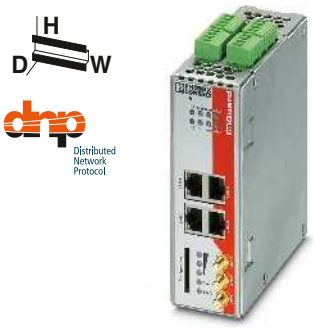
Program and configuration memory, plug-in	**SD FLASH 512MB**	2988146	1
License to configure and operate **VPN tunnels** between up to 250 FL MGUARD devices	**FL MGUARD LIC VPN-250**	2700193	1
License to configure **any number of tunnels** and operate **250 VPN** tunnels on FL MGUARD	**FL MGUARD LIC VPN-250 GROUP**	2700192	1



UMTS/HSPA mobile phone router with firewall and VPN, integrated 4-port switch



4G LTE mobile network router with firewall and VPN, manageable 4-port switch, DMZ port, and a second WAN interface



4G LTE mobile network router with firewall and VPN, integrated 4-port switch

Technical data

11 V DC ... 36 V DC (via plug-in COMBICON screw terminal block)	11 V DC ... 36 V DC (via plug-in COMBICON screw terminal block)	11 V DC ... 36 V DC (via plug-in COMBICON screw terminal block)
< 200 mA (24 V DC)	< 200 mA (24 V DC)	< 200 mA (24 V DC)
RJ45 10/100 Mbps (auto negotiation) 100 m (shielded twisted pair)	RJ45 10/100 Mbps (auto negotiation) 100 m (shielded twisted pair)	RJ45 10/100 Mbps (auto negotiation) 100 m (shielded twisted pair)
Web-based management, SNMP Router with simplified 2-click firewall and VPN for 2 tunnels (fixed), metal housing, slot for any SD memory card	Web-based management, SNMP Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card	Web-based management, SNMP Router with simplified 2-click firewall and VPN for 2 tunnels (fixed), metal housing, slot for any SD memory card
2 (Fixed, Ipsec (IETF standard)) DES, 3DES, AES-128, -192, -256 ESP tunnel / ESP transport X.509v3 certificates with RSA or PSK Simplified 2-click stateful inspection firewall Standard routing, NAT, 1:1-NAT, port forwarding	10 (up to 250 tunnels with additional license as an option) DES, 3DES, AES-128, -192, -256 ESP tunnel / ESP transport X.509v3 certificates with RSA or PSK Configurable stateful inspection firewall with full scope of functions Standard routing, NAT, 1:1-NAT, port forwarding	2 (Fixed, Ipsec (IETF standard)) DES, 3DES, AES-128, -192, -256 ESP tunnel / ESP transport X.509v3 certificates with RSA or PSK Simplified 2-click stateful inspection firewall Standard routing, NAT, 1:1-NAT, port forwarding
850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM)) / 800 MHz (0.25 W (UMTS)) / 850 MHz (0.25 W (UMTS)) / 900 MHz (0.25 W (UMTS)) / 1900 MHz (0.25 W (UMTS)) / 2100 MHz (0.25 W (UMTS)) / 800 MHz (CDMA2000 EV-DO) / 1900 MHz (CDMA2000 EV-DO) 1.8 volt, 3 volt Class 12, Class B LED bar graph to display receive quality 50 Ω impedance SMA antenna socket	850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM)) / 850 MHz (0.25 W (UMTS/HSPA)) / 900 MHz (0.25 W (UMTS/HSPA)) / 1900 MHz (0.25 W (UMTS/HSPA)) / 2100 MHz (0.25 W (UMTS/HSPA)) / 800 MHz (LTE (FDD)) / 850 MHz (LTE (FDD)) / 900 MHz (LTE (FDD)) 1.8 volt, 3 volt Class 12, Class B LED bar graph to display receive quality 50 Ω impedance SMA antenna socket	850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM)) / 850 MHz (0.25 W (UMTS/HSPA)) / 900 MHz (0.25 W (UMTS/HSPA)) / 1900 MHz (0.25 W (UMTS/HSPA)) / 2100 MHz (0.25 W (UMTS/HSPA)) / 800 MHz (LTE (FDD)) / 850 MHz (LTE (FDD)) / 900 MHz (LTE (FDD)) 1.8 volt, 3 volt Class 12, Class B LED bar graph to display receive quality 50 Ω impedance SMA antenna socket
3 10 V DC ... 30 V DC / 5 mA	3 10 V DC ... 30 V DC / 5 mA	3 10 V DC ... 30 V DC / 5 mA
3 10 V DC ... 30 V DC (depending on the operating voltage) ≤ 250 mA (Short-circuit-proof)	3 10 V DC ... 30 V DC (depending on the operating voltage) ≤ 250 mA (Short-circuit-proof)	3 10 V DC ... 30 V DC (depending on the operating voltage) ≤ 250 mA (Short-circuit-proof)
-40 °C ... 60 °C VCC // PE 1 kV (50 Hz, 1 min.) 45 mm / 130 mm / 114 mm Class A product, see page 525	-40 °C ... 60 °C VCC // PE 1 kV (50 Hz, 1 min.) 45 mm / 130 mm / 114 mm Class A product, see page 525	-40 °C ... 60 °C VCC // PE 1 kV (50 Hz, 1 min.) 45 mm / 130 mm / 114 mm Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
TC MGUARD RS2000 3G VPN	2903441	1

Accessories

SD FLASH 512MB	2988146	1

Ordering data

Type	Order No.	Pcs./Pkt.
TC MGUARD RS4000 4G VPN	2903586	1

Accessories

SD FLASH 512MB	2988146	1
FL MGUARD LIC VPN-250	2700193	1
FL MGUARD LIC VPN-250 GROUP	2700192	1

Ordering data

Type	Order No.	Pcs./Pkt.
TC MGUARD RS2000 4G VPN	2903588	1

Accessories

SD FLASH 512MB	2988146	1

Remote maintenance – TC CLOUD CLIENT via LAN and mobile network

The TC CLOUD CLIENT is positioned as a cost-effective field device for secure remote maintenance. The devices enable access to the mGuard Secure Cloud via the operator network or 4G mobile network.

The devices are optimized for use with the mGuard Secure Cloud. For this reason, all TC CLOUD CLIENT devices support Virtual Private Networks (VPNs) as standard. Even the firmware scope of functions is reduced to the essentials. This enables quick startup of the devices in the field and seamless, independent operation.

mGuard Secure Cloud

mGuard Secure Cloud constitutes a high-performance and scalable VPN infrastructure in the cloud, which connects service staff with machines and systems via the Internet.

The Basic Edition, available free of charge, enables one concurrent service connection.

The Premium Edition enables multiple concurrent service connections. Unlimited users and machines can be created and the cloud can be adapted to include extensions.

Features:

- Turnkey VPN infrastructure for operators, machine builders, and systems manufacturers
- Secure and reliable, thanks to industry-proven mGuard security technology
- Multiple access to various customers and systems possible
- Compatible with all mGuard security appliances and certified VPN clients
- Cloud-based VPN infrastructure from Phoenix Contact
- Support for mobile, iOS-based devices, such as Apple iPads and iPhones

new

Cloud client for access via operator networks

Technical data

Supply		
Supply voltage range		10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Nominal current consumption		< 200 mA (24 V DC)
Stand-by current consumption		65 mA (With activated energy-saving mode)
Ethernet interface		
Number of ports		2
Connection method		RJ45 socket, shielded
Transmission speed		10/100 Mbps, auto negotiation
Transmission length		100 m (shielded twisted pair)
Supported protocols		TCP/IP, UDP/IP, FTP, HTTP
Auxiliary protocols		ARP, DHCP, PING (ICMP), SNMP V1, SMTP
Functions		
Management		Web-based management, SNMP
Security functions		
Number of VPN tunnels		1
Firewall rules		Stateful inspection firewall
Mobile phone network		
Frequencies		-
SIM interface		-
Antenna connection		-
Digital input		
Number of inputs		1
Signal range		10 V DC ... 30 V DC
Digital output		
Number of outputs		1
Signal range		10 V DC ... 30 V DC (depending on the operating voltage) ≤ 50 mA (Not short-circuit proof)
General data		
Ambient temperature (operation)		0 °C ... 60 °C
Degree of protection		IP20
Electrical isolation		VCC // FE // Ethernet
Dimensions	W / H / D	45 mm / 130 mm / 126 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Cloud client			
	TC CLOUD CLIENT 1002-TX/TX	2702885	1

Accessories

Multiband mobile communication antenna, with mounting bracket for outdoor installation, 5 m antenna cable with SMA circular connector, dimensions: 82 mm x 48 mm			
Power supply, primary-switched	**TRIO-PS-2G/1AC/24DC/3/C2LPS**	2903147	1

new

Cloud client for access via 4G LTE mobile network (European version)

Technical data	
10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	
< 200 mA (24 V DC)	
65 mA (With activated energy-saving mode)	
2	
RJ45 socket, shielded	
10/100 Mbps, auto negotiation	
100 m (shielded twisted pair)	
TCP/IP, UDP/IP, FTP, HTTP	
ARP, DHCP, PING (ICMP), SNMP V1, SMTP	
Web-based management, SNMP	
1	
Stateful inspection firewall	
850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM)) / 850 MHz (0.25 W (UMTS/HSPA)) / 900 MHz (0.25 W (UMTS/HSPA)) / 1900 MHz (0.25 W (UMTS/HSPA)) / 2100 MHz (0.25 W (UMTS/HSPA)) / 800 MHz (LTE (FDD)) / 850 MHz (LTE (FDD)) / 900 MHz (LTE (FDD))	
1.8 volt, 3 volt	
50 Ω impedance SMA antenna socket	
1	
10 V DC ... 30 V DC	
1	
10 V DC ... 30 V DC (depending on the operating voltage)	
≤ 50 mA (Not short-circuit proof)	
0 °C ... 60 °C	
IP20	
VCC // LTE // Ethernet // PE	
45 mm / 130 mm / 126 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
TC CLOUD CLIENT 1002-4G	2702886	1

Accessories

TC ANT MOBILE WALL 5M	2702273	1
TRIO-PS-2G/1AC/24DC/3/C2LPS	2903147	1

new

Cloud client for access via 4G LTE mobile network (US version, Verizon)

Technical data	
10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	
< 200 mA (24 V DC)	
65 mA (With activated energy-saving mode)	
2	
RJ45 socket, shielded	
10/100 Mbps, auto negotiation	
100 m (shielded twisted pair)	
TCP/IP, UDP/IP, FTP, HTTP	
ARP, DHCP, PING (ICMP), SNMP V1, SMTP	
Web-based management, SNMP	
1	
Stateful inspection firewall	
700 MHz (LTE B13 / B17) / 1700 MHz (LTE B4) / 1900 MHz (LTE B2)	
1.8 volt, 3 volt	
50 Ω impedance SMA antenna socket	
1	
10 V DC ... 30 V DC	
1	
10 V DC ... 30 V DC (depending on the operating voltage)	
≤ 50 mA (Not short-circuit proof)	
0 °C ... 60 °C	
IP20	
VCC // LTE // Ethernet // PE	
45 mm / 130 mm / 126 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
TC CLOUD CLIENT 1002-4G VZW	2702887	1

Accessories

TC ANT MOBILE WALL 5M	2702273	1
TRIO-PS-2G/1AC/24DC/3/C2LPS	2903147	1

new

Cloud client for access via 4G LTE mobile network (US version, AT&T)

Technical data	
10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	
< 200 mA (24 V DC)	
65 mA (With activated energy-saving mode)	
2	
RJ45 socket, shielded	
10/100 Mbps, auto negotiation	
100 m (shielded twisted pair)	
TCP/IP, UDP/IP, FTP, HTTP	
ARP, DHCP, PING (ICMP), SNMP V1, SMTP	
Web-based management, SNMP	
1	
Stateful inspection firewall	
850 MHz (UMTS B5) / 1900 MHz (UMTS B2) / 700 MHz (LTE B13 / B17) / 850 MHz (LTE B5) / 1700 MHz (LTE B4) / 1900 MHz (LTE B2)	
1.8 volt, 3 volt	
50 Ω impedance SMA antenna socket	
1	
10 V DC ... 30 V DC	
1	
10 V DC ... 30 V DC (depending on the operating voltage)	
≤ 50 mA (Not short-circuit proof)	
0 °C ... 60 °C	
IP20	
VCC // LTE // Ethernet // PE	
45 mm / 130 mm / 126 mm	

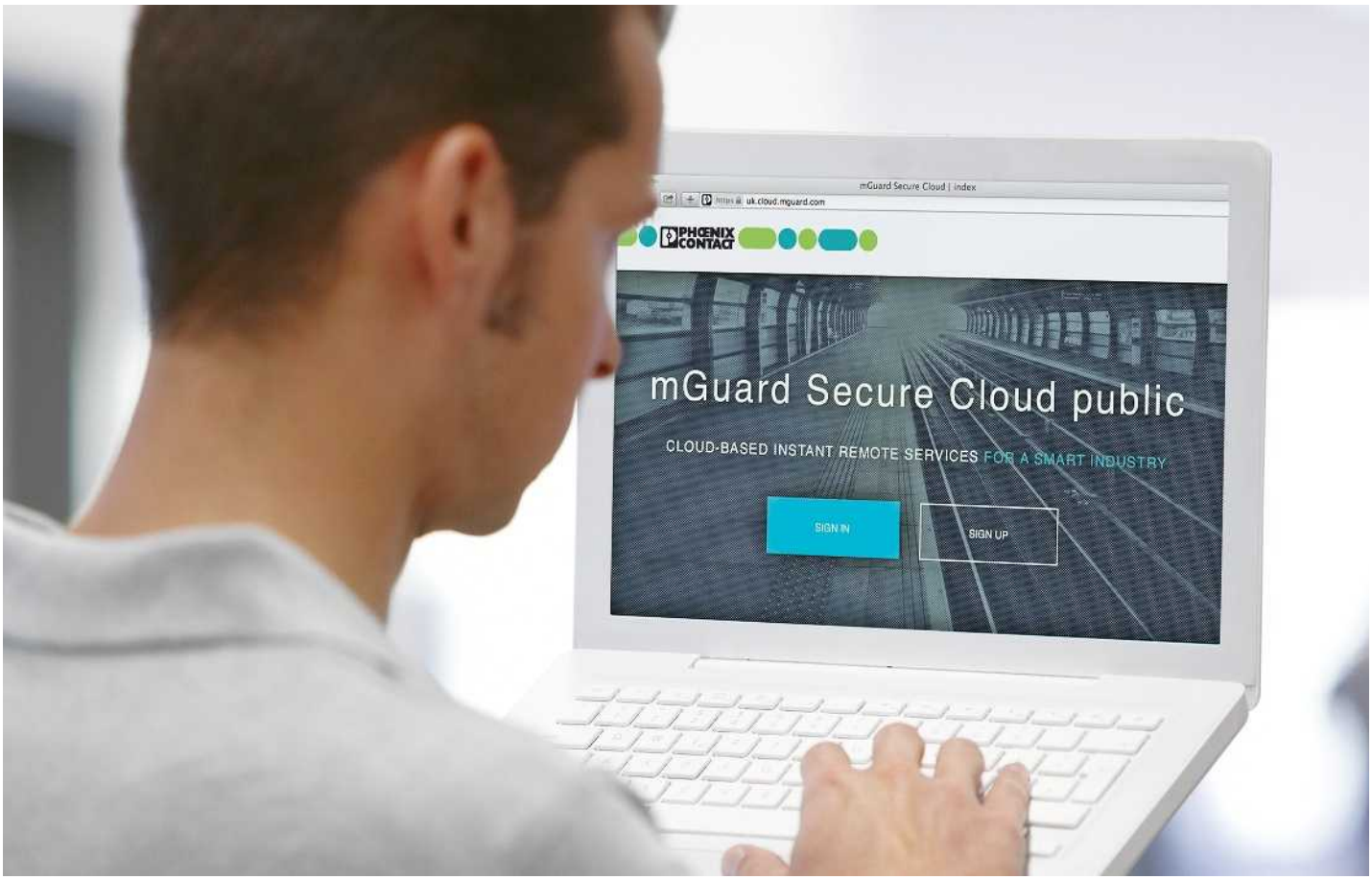
Ordering data

Type	Order No.	Pcs./Pkt.
TC CLOUD CLIENT 1002-4G ATT	2702888	1

Accessories

TC ANT MOBILE WALL 5M	2702273	1
TRIO-PS-2G/1AC/24DC/3/C2LPS	2903147	1

Remote maintenance via the cloud - encrypted and secure



Easy

The mGuard Secure Cloud public offers a turnkey complete VPN solution for operators and companies that build machines and manufacture systems. Service personnel connect quickly and securely to machines, industrial PCs, and controllers via a simple web interface. In addition, secure remote maintenance can be performed at any location and any time without requiring specialist IT knowledge.

Secure

The cloud is based on the mGuard industry standard and connects service personnel and remote maintenance locations securely via the Internet. Virtual Private Networks (VPNs) are used here with the proven IPsec security protocol. This guarantees the confidentiality, authenticity, and integrity of all data transmitted between all devices connected via the mGuard Secure Cloud.

Furthermore, the mGuard Secure Cloud is operated in a high-availability computer center in Germany in accordance with the most stringent data protection standards.

Reliable

In order to stay competitive in the global market, companies must be able to handle increasing pressures in terms of innovation and cost. Particularly for small and medium-sized companies, it is practically impossible to run an efficient in-house operation with comparable infrastructure at a reasonable cost. The mGuard Secure Cloud therefore provides companies with a reliable VPN infrastructure via the Internet as a service that is tailored to their needs.

Your advantages

- Turnkey VPN infrastructure for operators, machine builders, and systems manufacturers
- Secure and reliable, thanks to industry-proven mGuard security technology
- Multiple access to various customers and systems possible
- Compatible with all mGuard security appliances and certified VPN clients
- Support for iOS-based mobile devices, such as Apple iPads and iPhones

MGUARD SECURE CLOUD Basic Edition

mGuard Secure Cloud constitutes a high-performance and scalable VPN infrastructure in the cloud, which connects service staff with machines and systems via the Internet. The Basic Edition, available free of charge, enables one concurrent service connection. However, unlimited users and machines can be created.

The full scope of services can be found under de.cloud.mguard.com.

MGUARD SECURE CLOUD Premium Edition

mGuard Secure Cloud constitutes a high-performance and scalable VPN infrastructure in the cloud, which connects service staff with machines and systems via the Internet. The Premium Edition enables multiple concurrent service connections. Unlimited users and machines can be created and the cloud can be adapted to include extensions.

The full scope of services can be found under de.cloud.mguard.com.

MGUARD SECURE VPN CLIENT

The mGuard Secure VPN Client for Windows operating systems 10, 8.x, and 7 is used to connect PCs to a virtual private network (VPN). The client provides resources from remote networks securely and transparently. This connects the service engineer to the mGuard Secure Cloud.

The mGuard Secure VPN Client is available free of charge as a 30-day test version. The license for a full version can be ordered under MGUARD SECURE VPN CLIENT LIC - 2702579.

TC CLOUD CLIENT – LAN

The TC CLOUD CLIENT TX/TX is positioned as a cost-effective field device for secure remote maintenance scenarios via the operator network.

The devices are optimized for use with the mGuard Secure Cloud. For this reason, all TC CLOUD CLIENT devices support Virtual Private Networks (VPNs) as standard.

A scope of functions optimized for the mGuard Secure Cloud enables quick startup of the devices in the field.

TC CLOUD CLIENT – mobile network

The TC CLOUD CLIENT 4G product range offers cost-effective field devices for secure remote maintenance scenarios via the 4G LTE mobile network.

The devices are optimized for use with the mGuard Secure Cloud. For this reason, all TC CLOUD CLIENT devices support Virtual Private Networks (VPNs) as standard.

A scope of functions optimized for the mGuard Secure Cloud enables quick startup of the devices in the field.

MGUARD

The mGuard devices are suitable for distributed protection of production cells or individual machines against manipulation. For software-independent remote maintenance scenarios, you can use an mGuard as a VPN gateway for IPsec encrypted VPN tunnels for the mGuard Secure Cloud. It serves as a remote maintenance infrastructure for the secure connection of machines and systems.

Remote maintenance – analog modems

The analog modems are specifically designed to meet industrial requirements for worldwide remote maintenance. Serial connections on the public, analog phone network with speeds of up to 33.6 kbps are supported, as is dial-up to the GSM mobile communication network.

Remote maintenance via dial-up connection:
– Direct access to remotely located controllers for software updates and remote diagnostics

PSI-MODEM/ETH
Dial-up line modem for accessing a remote Ethernet network
– Permanent 128-bit authentication
– CHAP protocol

PSI-DATA/BASIC-MODEM/RS232
Dial-up line modem for remote maintenance of systems with a V.24 (RS-232) interface

PSI-MODEM-BASIC/USB
Dial-up line modem for remote maintenance of systems with USB interface
– 5 V DC supply via USB interface

All devices feature:
a) For interference-proof operation, including under harsh EMC conditions:
– High-quality electrical isolation
– Integrated surge protection

b) Comprehensive security functions that prevent unauthorized access by means of
– Configurable, selective call acceptance
– Connection establishment with password protection
– Callback function

Supply	
Supply voltage range	
Supply voltage	
Nominal current consumption	
Stand-by current consumption	
Serial port	
Interfaces	
Connection method	
Data format/coding	
Data flow control/protocols	
Transmission speed	
PSTN port (a/b line)	
Connection method	
Dialing procedure	
General data	
Ambient temperature (operation)	
Electrical isolation	
Test voltage	
Approvals for countries	
Electromagnetic compatibility	
Dimensions	W / H / D
EMC note	

Description
Industrial, analog Ethernet modem, Scope of supply: Modem, RJ12/RJ12 cable, TAE adapter
Industrial analog modem, alarm input and output, scope of delivery: Modem, CD with configuration software, manual and RJ12/RJ12 cable
Industrial analog modem with USB connection, scope of supply: Modem, driver CD with manual, USB cable and RJ12/RJ12 cable

System power supply, primary-switched
DIN rail connector
RS-232-D-SUB cable, length: 2 m
RS-232-D-SUB cable, length: 0.5 m

H D W

Ethernet

dnp Distributed Network Protocol

Modem for dial-up operation with Ethernet connection (LAN)

Ex:

Technical data

10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	
24 V DC ±5 % (as an alternative or redundant, via backplane bus contact and system current supply)	
< 100 mA (24 V DC) < 70 mA (stand by)	
Ethernet interface, 10/100BASE-T(X) in acc. with IEEE 802.3u	
RJ45 socket, shielded -	
TCP/IP, UDP, TFTP, HTTP, Modbus/TCP, PPP, PROFINET, EtherNet IP, CHAP 10/100 Mbps, auto negotiation	
RJ12, 6-pos. Multiple frequency/pulse dialing, configuration via software	
0 °C ... 55 °C VCC // PSTN // Ethernet 1.5 kV (50 Hz, 1 min.) EU, USA, Canada, other countries in preparation	
Conformance with EMC Directive 2014/30/EU 45 mm / 99 mm / 114.5 mm Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
PSI-MODEM/ETH	2313300	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	2707437	50

H D W

RS-232

dnp Distributed Network Protocol

Modem for dial-up operation with RS-232 connection

Ex:

Technical data

10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	
24 V DC ±5 % (as an alternative or redundant, via backplane bus contact and system current supply)	
< 100 mA (24 V DC) < 40 mA	
RS-232 interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1	
D-SUB 9 connector Serial asynchronous UART/NRZ, 7/8 data, 1/2 stop, 1 parity, 10/11-bit character length Software handshake, Xon/Xoff or hardware handshake RTS/CTS Automatic data rate detection 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bits/s	
RJ12, 6-pos. Multiple frequency/pulse dialing, configuration via software	
0 °C ... 55 °C VCC // PSTN // RS-232 1.5 kV EU, USA, Canada, other countries in preparation	
Conformance with EMC Directive 2014/30/EU 22.5 mm / 99 mm / 114.5 mm Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
PSI-DATA/BASIC-MODEM/RS232	2313067	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	2707437	50
PSM-KA9SUB9/BB/2METER	2799474	1
PSM-KA9SUB9/BB/0,5METER	2708520	1

H D W

dnp Distributed Network Protocol

Modem for dial-up operation with USB connection

Technical data

-	
5 V DC (Via mini USB type B)	
< 100 mA (for 5 V DC, nominal operation) < 40 mA (for 5 V DC, sleep mode)	
USB 1.1	
Mini USB type B -	
- -	
RJ12, 6-pos. Multiple frequency/pulse dialing, configuration via software	
0 °C ... 55 °C PSTN // USB 1.5 kV EU, USA, Canada, other countries in preparation	
Conformance with EMC Directive 2014/30/EU 22.5 mm / 99 mm / 114.5 mm Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
PSI-MODEM-BASIC/USB	2313436	1

Accessories

Remote control and remote maintenance – DSL broadband routers

Industrial ADSL broadband routers – Support for ADSL/ADSL2/ADSL2+ according to Annex A, B, and J

The TC DSL router range supports the high-speed connection of industrial Ethernet or RS-232 devices to the Internet using high-availability ADSL technology. Machines, systems or complete Ethernet networks can therefore be accessed from anywhere in the world at any time using a broadband Internet connection.

Developed specially for use in industrial environments, the TC DSL routers are ideal for short-term high-speed access in the event of servicing. Thanks to the use of the integrated safety functions, a permanent connection to remote stations is even possible from central company headquarters.

Remote maintenance (short-term high-speed access)
- Quick and easy remote access to machines, systems or Ethernet networks

Remote control (VPN tunnel)
- Permanent connection of substations to the control room for cyclic data acquisition and monitoring
- Highly secure broadband alternative to analog permanent line applications

Alarm generation and remote control
- High-availability alarm generation via e-mail
- Individual configuration of switching outputs, such as worldwide remote control of switching outputs or indication of a DSL connection abort, etc.

Features:

The DSL broadband routers are designed for worldwide and flexible use, there is no need for the application/provider requirements to be clarified in advance. This enables individual and fast startup on site.

One universal device type
- All common ADSL standards are supported (ADSL/ADSL2/ADSL2+)
- Integrated Annex A/B/J switchover

Note: the specifications for the standard and frequency range used (Annex) depend on the provider and are included in the access data sent by the provider.
- Annex A: DSL operation parallel to analog telephony (in most of the world)
- Annex B: DSL operation parallel to ISDN (in Germany and neighboring countries)
- Annex J: IP-based connections (ALL-IP connections of Deutsche Telekom)

Individual function selection between modem or router function
- DSL modem: converter from DSL to LAN - the router/firewall function is performed by a separate router, e.g., FL MGUARD
- DSL router: DSL modem plus integrated router functions, e.g., firewall, VPN, NAT, etc.

All TC DSL routers offer increased resistance to typical industrial influences, such as temperature and EMI, and therefore increased fault tolerance and application availability.

TC DSL ROUTER X400 A/B
- Quick and easy startup
- Optimized to the key functions of an industrial DSL broadband router/modem
- Integrated firewall

TC DSL ROUTER X500 A/B
- Multifunctional for highly secure network access
- Suitable for special applications
- DSL broadband router/modem
- VPN tunneling:
  IPsec (client and server)
  Open VPN (client)
- NAT table
- Serial device server for 10/100Base-T(X) with RS-232
- Alarm inputs: send e-mails
- Switching outputs: set by WBM local/remote, VPN service, connection lost, DSL/Internet link

DSL router/modem with firewall

DSL router/modem with firewall, VPN, serial device server, inputs/outputs

	Technical data	Technical data
Supply		
Supply voltage range	10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Nominal current consumption	< 150 mA (24 V DC)	< 150 mA (24 V DC)
Stand-by current consumption	< 135 mA (stand by)	< 135 mA (stand by)
RS-232 Interface		
Connection method	-	D-SUB 9 connector
Transmission speed	-	0.3; 1.2; 2.4; 4.8; 9.6; 19.2; 38.4; 57.6; 115.2 kbps
Transmission length	-	15 m
Ethernet interface		
Connection method	8P8C RJ45 socket, shielded	8P8C RJ45 socket, shielded
Transmission speed	10/100 Mbps, auto negotiation	10/100 Mbps, auto negotiation
Transmission length	≤ 100 m (shielded twisted pair)	≤ 100 m (shielded twisted pair)
Supported protocols	TCP/IP, UDP/IP, FTP, HTTP	TCP/IP, UDP/IP, FTP, HTTP
Auxiliary protocols	ARP, DHCP, PING (ICMP), SNMP V1, SMTP	ARP, DHCP, PING (ICMP), SNMP V1, SMTP
DSL interface		
Connection method	6P2C RJ11 socket, shielded COMBICON connector screw terminal block	6P2C RJ11 socket, shielded COMBICON connector screw terminal block
Transmission speed	≤ 25 Mbps (Annex A/B, downstream from Internet) ≤ 1 Mbps (Annex A/B, upstream to Internet) ≤ 25 Mbps (Annex J, downstream from Internet) ≤ 2.4 Mbps (Annex J, upstream to Internet)	≤ 25 Mbps (Annex A/B, downstream from Internet) ≤ 1 Mbps (Annex A/B, upstream to Internet) ≤ 25 Mbps (Annex J, downstream from Internet) ≤ 2.4 Mbps (Annex J, upstream to Internet)
Transmission length	≤ 5 km	≤ 5 km
Functions		
Management	Web-based management	Web-based management
Security functions		
Number of VPN tunnels	-	3
Firewall rules	Stateful inspection firewall	Stateful inspection firewall
Digital input		
Number of inputs	-	6
Signal range	-	10 V DC ... 30 V DC / 5 mA
Digital output		
Number of outputs	-	4
Signal range		10 V DC ... 30 V DC (depending on the operating voltage) ≤ 50 mA (Short-circuit-proof)
General data		
Ambient temperature (operation)	-20 °C ... 60 °C	-20 °C ... 60 °C
Degree of protection	IP20	IP20
Electrical isolation	VCC//ADSL//Ethernet//FE	VCC + IO + RS-232//ADSL//Ethernet//FE
Test voltage	1.5 kV_{rms} (50 Hz, 1 min.)	1.5 kV_{rms} (50 Hz, 1 min.)
Approvals for countries	EU, other countries in preparation	EU, other countries in preparation
Dimensions W / H / D	45 mm / 99 mm / 112 mm	45 mm / 99 mm / 112 mm
EMC note	Class A product, see page 525	Class A product, see page 525

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Industrial ADSL broadband router, according to Annex A, B and J	**TC DSL ROUTER X400 A/B**	2902709	1	**TC DSL ROUTER X500 A/B**	2902710	1
	Accessories			**Accessories**		
System power supply, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	2866983	1	**MINI-SYS-PS-100-240AC/24DC/1.5**	2866983	1
DATATRAB, protective adapter for insertion in the data cable	**DT-TELE-RJ45**	2882925	1	**DT-TELE-RJ45**	2882925	1
DATATRAB adapter, protective adapter for inserting into the data line	**DT-LAN-CAT.6+**	2881007	1	**DT-LAN-CAT.6+**	2881007	1

Remote control – Ethernet extenders

Use the new Ethernet extenders to connect large Ethernet networks of up to 20 kilometers. Exceptionally easy startup using Plug and Play and the innovative combination of unmanaged and managed extenders enables cost-effective networking and IP diagnostics of all devices and paths.

Existing two-wire cables can be used for networking. The system can be extended during operation without causing any adverse impact.

Features:

– Ethernet communication up to 20 kilometers via any two-wire cables
– Fast startup via Plug and Play
– Use of unmanaged extenders in complex IP networks
– Continuous diagnostics of all devices and paths via IP, regardless of the location
– High failsafe performance, thanks to preemptive maintenance with replaceable PLUGTRAB PT-IQ surge protection

Intelligent and systematic surge protection – PLUGTRAB PT-IQ

– Multi-stage monitoring for high system availability
– Fast diagnostics via display or LED
– Remote diagnostics via IP and automatic event messages via SNMP
– Notification that replacement is required when performance limit is reached or in the event of overload
– Robust metal housing
– IP67 degree of protection
– Easy panel mounting

Managed Ethernet extender

– Remote diagnostics via IP, web-based management or SNMP
– Replaceable SHDSL surge protection (1 x PLUGTRAB PT-IQ)

Unmanaged Ethernet extender

– On-site remote diagnostics via USB

19" unmanaged extender

– 19" central communication unit with six autonomous unmanaged Ethernet extenders
– Integrated, non-replaceable SHDSL surge protection (6 x DT-TELE-SHDSL)

Managed Ethernet extender, 2 SHDSL ports, replaceable surge protection

Technical data

Supply		
Supply voltage range		10 V DC ... 60 V DC
Supply voltage		24 V DC ±5 %
Supply voltage		-
Nominal current consumption		90 mA (60 V DC)
Ethernet interface		
Connection method		RJ45 socket
Transmission speed		10/100 Mbps, auto negotiation
SHDSL interface		SHDSL interface according to ITU-T G.991.2.bis
Connection method		Push-in spring connection
Transmission speed		4-wire operation: 64 kbps ... 30 Mbps 2-wire operation: 32 kbps ... 15.3 Mbps
USB interface		
Connection method		-
Functions		
Management		Web-based management: Diagnostics, log book, customized configuration
Digital output		
Number of outputs		2
Signal range		depending on the operating voltage ≤ 500 mA (Short-circuit-proof)
Behavior of outputs		-
General data		
Ambient temperature (operation)		-25 °C ... 60 °C
Electrical isolation		VCC // Ethernet // DSL (A) // DSL (B) // FE
Test voltage		1.5 kV AC (50 Hz, 1 min.)
Electromagnetic compatibility		Conformance with EMC Directive 2014/30/EU
Dimensions	W / H / D	60 mm / 130 mm / 160 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet extender, for distances of up to 20 km on in-house copper cables - for point-to-point, line, and star structures - for point-to-point connections	**TC EXTENDER 6004 ETH-2S**	2702255	1

Accessories

System power supply, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	2866983	1
DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device	**ME 17,5 TBUS 1,5/ 5-ST-3,81 GN**	2709561	10
Replaceable surge protection module, with two-wire protection for floating SHDSL cables, two-level protective circuit	**TC EXTENDER PT-IQ-2S**	2702258	1
DATATRAB adapter, protective adapter for inserting into the data line	**DT-LAN-CAT.6+**	2881007	1
DATATRAB adapter, protective adapter with RJ45 and screw connection for two SHDSL telecommunications interfaces			
Program and configuration memory, plug-in	**SD FLASH 512MB**	2988146	1

Ethernet

DSL

Managed Ethernet extender, 1 SHDSL port, replaceable surge protection

Technical data	
10 V DC ... 60 V DC	
24 V DC ±5 %	
-	
80 mA (60 V DC)	
RJ45 socket	
10/100 Mbps, auto negotiation	
SHDSL interface according to ITU-T G.991.2.bis	
Push-in spring connection	
2-wire operation: 32 kbps ... 15.3 Mbps	
-	
Web-based management: Diagnostics, log book, customized configuration	
1	
depending on the operating voltage	
≤ 500 mA (Short-circuit-proof)	
-	
-25 °C ... 60 °C	
VCC // Ethernet // DSL (A/B) // FE	
1.5 kV AC (50 Hz, 1 min.)	
Conformance with EMC Directive 2014/30/EU	
60 mm / 130 mm / 160 mm	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
TC EXTENDER 4001 ETH-1S	2702253	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
TC EXTENDER PT-IQ-1S	2702257	1
DT-LAN-CAT.6+	2881007	1
SD FLASH 512MB	2988146	1

Ethernet

DSL

Unmanaged Ethernet extender, 2 SHDSL ports

Technical data	
18 V DC ... 30 V DC	
24 V DC ±5 % (as an alternative or redundant, via backplane bus contact and system current supply)	
-	
< 180 mA (24 V DC)	
RJ45 socket, shielded	
10/100 Mbps, auto negotiation	
SHDSL interface according to ITU-T G.991.2.bis	
2 x 2-pos. COMBICON connector screw terminal blocks	
4-wire operation: 64 kbps ... 30 Mbps	
2-wire operation: 32 kbps ... 15.3 Mbps	
USB 2.0	
Mini-USB type B, 5-pos.	
Plug and Play, diagnostics via PSI-CONF software or web-based management (only with managed Ethernet extenders)	
2	
depending on the operating voltage	
≤ 150 mA (Short-circuit-proof)	
Deactivated for device supply via DIN rail connector	
-20 °C ... 60 °C (Freestanding (40 mm spacing to the right and left), no supply of other modules via the device)	
VCC // Ethernet // DSL (A) // DSL (B) // FE	
1.5 kV_{rms} (50 Hz, 1 min.)	
Conformance with EMC Directive 2014/30/EU	
35 mm / 99 mm / 114.5 mm	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
TC EXTENDER 2001 ETH-2S	2702409	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
DT-TELE-SHDSL	2801593	1

Ethernet

DSL

19" unmanaged Ethernet extender, 12 SHDSL ports, integrated surge protection

Technical data	
100 V AC ... 240 V AC	
-	
230 V AC (50 Hz ... 60 Hz)	
< 300 mA (220 V AC)	
RJ45 socket, shielded	
10/100 Mbps, auto negotiation	
SHDSL interface according to ITU-T G.991.2.bis	
Socket M8	
4-wire operation: 64 kbps ... 30 Mbps	
2-wire operation: 32 kbps ... 15.3 Mbps	
USB 2.0	
USB Type B	
Plug and Play, diagnostics via PSI-CONF software or web-based management (only with managed Ethernet extenders)	
-	
-	
5 °C ... 35 °C (Cabinet temperature)	
VCC // Ethernet // DSL (A) // DSL (B) // FE	
1.5 kV_{rms} (50 Hz, 1 min.)	
Conformance with EMC Directive 2014/30/EU	
438 mm / 178 mm / 330 mm	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
TC ETH EXTENDER S19	2702077	1

Accessories

Remote control – extenders

Network PROFIBUS or serial devices that are up to 20 km away from each other via existing copper wires, e.g., using in-house telephone lines. Special Ethernet or fiber optic cables are not required.

Features:
– Plug and Play
– Distances up to 20 km
– Data rates of up to 30 Mbps (4-wire)
– Data rates of up to 15.3 Mbps (2-wire)
– Robust modulation method (SHDSL)
– Via in-house cables, not via the public telephone network

Topologies:
– Point-to-point
– Line structure
– Redundancy operation

Additional features:
– Two digital outputs for status transmission
– Configuration software for extended functionality
– Online diagnostics
– Logbook function
– Saving and printing of project and device configurations

PROFIBUS:
– Data rates of up to 1.5 Mbps (point-to-point)
– Data rates of up to 500 kbps (line structure)
– Redundancy operation supported Configuration software
– Easy, guided configuration
– Calculation of the maximum PROFIBUS data rate
– Calculation of the slot time
– Online diagnostics
– Mixed operation of copper cables and fiber optics

RS-232/RS-422/RS-485:
– RS-232 interface (9-pos. D-SUB): Data rates of up to 230.4 kbps
– Automatic DCE/DTE switchover
– RS-422/RS-485 W2 interface (COMBICON connector): Data rates of up to 2000 kbps
– Termination resistor, can be enabled/disabled (RS-485 W2)

Additional information can be found in the relevant data sheets/user manuals.

Supply	
Supply voltage range	
Supply voltage	
Nominal current consumption	
RS-232 Interface	
Connection method	
Transmission speed	
RS-422 interface	
Connection method	
Transmission speed	
RS-485 interface	
Connection method	
Transmission speed	
SHDSL interface	
Connection method	
Transmission speed	
Transmission length	
USB interface	
Connection method	
Functions	
Management	
Digital output	
Number of outputs	
General data	
Ambient temperature (operation)	
Electrical isolation	
Test voltage	
Electromagnetic compatibility	
Dimensions	W / H / D
EMC note	

Description
SHDSL permanent line modem, for point-to-point, linear, and star structures on in-house 2- and 4-wire cables
System power supply, primary-switched
DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device
DATATRAB adapter, protective adapter with RJ45 and screw connection for two SHDSL telecommunications interfaces

RS-232

Serial extender

PROFIBUS extender

Technical data

18 V DC ... 30 V DC 24 V DC ±5 % (as an alternative or redundant, via backplane bus contact and system current supply)	18 V DC ... 30 V DC 24 V DC ±5 % (as an alternative or redundant, via backplane bus contact and system current supply)
< 180 mA (24 V DC)	< 180 mA (24 V DC)
D-SUB 9 connector 0.11/0.3/1.2/2.4/4.8/9.6/19.2/38.4/57.6/115.2/230.4 kbps, NRZ	- -
RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1	
Plug-in/screw connection via COMBICON 1.2/2.4/4.8/7.0/9.6/19.2/38.4/57.6/75/93.75/115.2/136/187.5/375/500/1500/2000 kbps, NRZ	- -
RS-485 interface, in acc. with EIA/TIA-485, DIN 66259-4/RS-485 2-wire Plug-in/screw connection via COMBICON 1.2/2.4/4.8/7.0/9.6/19.2/38.4/57.6/75/93.75/115.2/136/187.5/375/500/1500/2000 kbps, NRZ	PROFIBUS acc. to IEC 61158, RS-485 2-wire, half duplex, automatic control D-SUB-9 socket 9.6/19.2/45.45/93.75/187.5/500/1500 kbps, set via configuration software
SHDSL interface according to ITU-T G.991.2.bis 2 x 2-pos. COMBICON connector screw terminal blocks 4-wire operation: 64 kbps ... 30 Mbps 2-wire operation: 32 kbps ... 15.3 Mbps up to 20 km (Depending on data rate and cable cross section)	SHDSL interface according to ITU-T G.991.2.bis 2 x 2-pos. COMBICON connector screw terminal blocks 4-wire operation: 64 kbps ... 30 Mbps 2-wire operation: 32 kbps ... 15.3 Mbps up to 20 km (Depending on data rate and cable cross section)
USB 2.0 Mini-USB type B, 5-pos.	USB 2.0 Mini-USB type B, 5-pos.
User-friendly software: Guided configuration, plausibility checks, diagnostic functions, log book	User-friendly software: Guided configuration, plausibility checks, diagnostic functions, log book
2	2
-20 °C ... 60 °C (for derating, see technical documentation)	-20 °C ... 60 °C (for derating, see technical documentation)
DIN EN 50178 (VCC, RS-232 // RS-422, RS-485 // DSL (A) // DSL (B) // FE) 1.5 kV_{rms} (50 Hz, 1 min.) Conformance with EMC Directive 2014/30/EU 35 mm / 99 mm / 114.5 mm Class A product, see page 525	DIN EN 50178 (VCC // PROFIBUS // DSL (A) // DSL (B) // FE) 1.5 kV_{rms} (50 Hz, 1 min.) Conformance with EMC Directive 2014/30/EU 35 mm / 99 mm / 114.5 mm Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
PSI-MODEM-SHDSL/SERIAL	2313669	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
DT-TELE-SHDSL	2801593	1

Ordering data

Type	Order No.	Pcs./Pkt.
PSI-MODEM-SHDSL/PB	2313656	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
DT-TELE-SHDSL	2801593	1

Remote control – mobile routers

The TC ROUTER for mobile networks implements high-performance, high-speed data connections of up to 150 Mbps via mobile 4G LTE networks. This enables you to establish a mobile broadband connection for highly flexible site networking even in places where a wired Internet connection is not available. These connections can be used to transmit sensitive data securely over mobile networks.

Furthermore, the TC ROUTER offers a high level of security, thanks to IPsec or OpenVPN tunnels, as well as an integrated stateful packet inspection firewall. In this way, it reliably protects the application against unauthorized access.

The TC ROUTER transmits data quickly and securely between the control room and networks in the field and is ideal for the following areas:
– Public utilities
– Energy and water suppliers
– Operators that network and remotely maintain oil and gas fields

A low-priced 3G version is available for mid-level bandwidth requirements.

Features:
– Virtual permanent line to connect networks via the mobile network
– Stateful inspection firewall for dynamic filtering
– IPsec and OpenVPN
– Up to three VPN tunnels simultaneously
– Authentication with X.509 certificates and via pre-shared key (PSK)
– VPN remote start via call or SMS
– 1:1 NAT in the VPN
– Two switching inputs and one switching output
– Alarm sent via SMS or e-mail directly via the integrated switching input
– Configuration via web-based management or microSD card
– Two local Ethernet connections
– Integrated logbook
– Extended temperature range (-40 °C ... +70 °C)
– MIMO antennas
– Downward compatible within the mobile communications standard

Inputs and outputs

Two configurable switching inputs for the following functions:
– Sending an SMS, including to multiple recipients
– Sending an e-mail, including to multiple recipients
– Controlling an output at a remote station via SMS
– Restarting the router
– Starting or stopping a mobile data connection
– Switching the IPsec or OpenVPN connection
– Automatically loading a configuration from a microSD card
– Activating energy-saving mode

One configurable switching output, activated by:
– Activation by the input at a remote station
– SMS
– Web-based management
– Incoming call
– Connection abort
– Status of the mobile network connection
– Status of the mobile data connection
– Status of a VPN connection

Additional functions:

Slot for microSD card

You can use a microSD card to load the configuration in the device or permanently store log files.

Energy-saving mode

In energy-saving mode, the power consumption of the mobile router is reduced for battery-powered applications. You can configure the mode via the web interface and activate it via a switching input. When energy-saving mode is activated, the communication interfaces switch to standby mode. Data transmission is limited.

XML interface

The XML interface enables operation and diagnostics of devices from the local LAN. You can therefore query the status of the mobile network connection via Ethernet, for example, or send SMS messages and e-mails.

Supply	
Supply voltage range	
Nominal current consumption	
Stand-by current consumption	
Ethernet interface	
Number of ports	
Connection method	
Transmission speed	
Transmission length	
Supported protocols	
Auxiliary protocols	
Functions	
Management	
Security functions	
Number of VPN tunnels	
Firewall rules	
Digital input	
Number of inputs	
Signal range	
Digital output	
Number of outputs	
Signal range	
General data	
Ambient temperature (operation)	
Degree of protection	
Electrical isolation	
Dimensions	W / H / D

Description
Industrial LTE 4G router
- European version
- Version for Verizon (US)
- Version for AT&T (US)
Industrial 3G router
- European version

Multiband mobile communication antenna, with mounting bracket for outdoor installation, 5 m antenna cable with SMA circular connector, dimensions: 82 mm x 48 mm
Power supply, primary-switched

Ethernet

GSM

dnp Distributed Network Protocol

with firewall, NAT, and VPN, fallback to 3G (HMTS/HSPA), and 2G (GPRS/EDGE), European version

new

Ethernet

GSM

dnp Distributed Network Protocol

with firewall and NAT, fallback to 3G (HMTS/HSPA), and 2G (GPRS/EDGE), European version

new

Ethernet

dnp Distributed Network Protocol

with firewall, NAT, and VPN, US version

Technical data

	TC ROUTER 3002T-4G	TC ROUTER 3002T-3G
	10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	
	< 200 mA (24 V DC) 65 mA (With activated energy-saving mode)	
	2 RJ45 socket, shielded 10/100 Mbps, auto negotiation 100 m (shielded twisted pair) TCP/IP, UDP/IP, FTP, HTTP ARP, DHCP, PING (ICMP), SNMP V1, SMTP	
	Web-based management, SNMP	
	3 Stateful inspection firewall	
	2 10 V DC ... 30 V DC	
	1 10 V DC ... 30 V DC (depending on the operating voltage) ≤ 50 mA (Not short-circuit proof)	
	-40 °C ... 70 °C (Maximum transmission power 5 dBm)	-40 °C ... 70 °C (Maximum transmission power 10 dBm)
	IP20	
	VCC // LTE // Ethernet // PE	VCC // UMTS // Ethernet // PE
	45 mm / 130 mm / 126 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
TC ROUTER 3002T-4G	2702528	1
TC ROUTER 3002T-3G	2702529	1

Accessories

TC ANT MOBILE WALL 5M	2702273	1
TRIO-PS-2G/1AC/24DC/3/C2LPS	2903147	1

Technical data

	TC ROUTER 2002T-4G	TC ROUTER 2002T-3G
	10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	
	< 200 mA (24 V DC) 65 mA (With activated energy-saving mode)	
	2 RJ45 socket, shielded 10/100 Mbps, auto negotiation 100 m (shielded twisted pair) TCP/IP, UDP/IP, FTP, HTTP ARP, DHCP, PING (ICMP), SNMP V1, SMTP	
	Web-based management, SNMP	
	Stateful inspection firewall	
	2 10 V DC ... 30 V DC	
	1 10 V DC ... 30 V DC (depending on the operating voltage) ≤ 50 mA (Not short-circuit proof)	
	-40 °C ... 70 °C (Maximum transmission power 5 dBm)	-40 °C ... 70 °C (Maximum transmission power 10 dBm)
	IP20	
	VCC // LTE // Ethernet // PE	VCC // UMTS // Ethernet // PE
	45 mm / 130 mm / 126 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
TC ROUTER 2002T-4G	2702530	1
TC ROUTER 2002T-3G	2702531	1

Accessories

TC ANT MOBILE WALL 5M	2702273	1
TRIO-PS-2G/1AC/24DC/3/C2LPS	2903147	1

Technical data

	TC ROUTER 3002T-4G VZW	TC ROUTER 3002T-4G ATT
	10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	
	< 200 mA (24 V DC) 65 mA (With activated energy-saving mode)	
	2 RJ45 socket, shielded 10/100 Mbps, auto negotiation 100 m (shielded twisted pair) TCP/IP, UDP/IP, FTP, HTTP ARP, DHCP, PING (ICMP), SNMP V1, SMTP	
	Web-based management, SNMP	
	3 Stateful inspection firewall	
	2 10 V DC ... 30 V DC	
	1 10 V DC ... 30 V DC (depending on the operating voltage) ≤ 50 mA (Not short-circuit proof)	
	-40 °C ... 70 °C (Maximum transmission power 5 dBm)	
	IP20	
	VCC // LTE // Ethernet // PE	
	45 mm / 130 mm / 126 mm	

Ordering data

Type	Order No.	Pcs./Pkt.
TC ROUTER 3002T-4G VZW	2702532	1
TC ROUTER 3002T-4G ATT	2702533	1

Accessories

TC ANT MOBILE WALL 5M	2702273	1
TRIO-PS-2G/1AC/24DC/3/C2LPS	2903147	1

Remote control – serial quad band modem for GPRS and GSM

Send RS-232 data all around the world via mobile phone network

Mobile phone network:
– GSM mobile phone networks: 850, 900, 1800, and 1900 MHz
– For worldwide use

GPRS TCP/IP connection:
– Connection established via IP addresses
– Client/server functionality
– IPT compatible
– Integrated TCP/IP stack for TCP and UDP connections
– Data rates of up to 53.6 kbps
– Security:
- Firewall

GSM dial-up connection:
– Connection established via data phone number (CSD)
– Security:
- Connection established with password protection
- Selective call acceptance
- Callback function

RS-232 interface:
– Freely parameterizable (baud rate, data bits, parity, stop bit, flow control)

Digital I/Os:
– Two digital switching inputs: Sending of freely configurable text messages (SMS, FAX, e-mail)
– One switching output on the backplane

Additional features:
– Encryption of SIM card PINs
– Can be used regardless of controller manufacturer
– High electromagnetic compatibility
– Electrically isolated
– Convenient configuration software
– Configuration via SMS

with RS-232 interface, integrated TCP/IP stack, and 2 alarm inputs

Ex:

Technical data

Supply		
Supply voltage range		10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Supply voltage		24 V DC ±5 % (as an alternative or redundant, via backplane bus contact and system current supply)
Nominal current consumption		< 350 mA (24 V DC)
Stand-by current consumption		< 80 mA (stand by)
RS-232 Interface		
Connection method		D-SUB 9 connector
Data format/coding		Serial asynchronous UART/NRZ, 7/8 data, 1/2 stop, 1 parity, 10/11-bit character length
Data flow control/protocols		Software handshake, Xon/Xoff or hardware handshake RTS/CTS
Transmission speed		1.2/2.4/9.6/19.2/38.4/57.6/115.2 kbps (can be set manually and automatically)
Mobile phone network		
Frequencies		850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM))
SIM interface		1.8 volt, 3 volt
GPRS compatibility		Class 10, Class B
Network function		4 time slots for receiving data, 2 time slot for transmitting data. The PIN is saved in the modem. After a voltage interruption, there is automatic redialing into the network Integrated TCP/IP Stack, independent connection establishment.
Network check		LED to show data signal quality
Antenna connection		50 Ω impedance SMA antenna socket
Digital input		
Number of inputs		2
Signal range		9 V DC ... 60 V DC / 5 mA
Digital output		
Number of outputs		1
Signal range		10 V DC ... 30 V DC ≤ 80 mA (24 V)
General data		
Ambient temperature (operation)		-25 °C ... 60 °C
Electrical isolation		VCC // RS-232 // GSM
Test voltage		1.5 kV (50 Hz, 1 min.)
Approvals for countries		EU, USA, Canada, other countries in preparation
Dimensions	W / H / D	22.5 mm / 99 mm / 118.6 mm
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Industrial GPRS/GSM modem with RS-232 interface, scope of supply: Modem, CD with configuration software and user manual	**PSI-GPRS/GSM-MODEM/RS232-QB**	2313106	1

Accessories

Multiband antenna for UMTS and quad band GSM, with omnidirectional characteristic, 2 m antenna cable with SMA round connector, degree of protection: IP65, dimensions: 76 x 20 mm	**PSI-GSM/UMTS-QB-ANT**	2313371	1
System power supply, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	2866983	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	2707437	50
RS-232-D-SUB cable, length: 2 m	**PSM-KA9SUB9/BB/2METER**	2799474	1
RS-232-D-SUB cable, length: 0.5 m	**PSM-KA9SUB9/BB/0,5METER**	2708520	1

Antennas

The antennas can be used as multiband antennas for all GSM and UMTS networks.

The TC ANT MOBILE WALL 5M antenna is ideal for wall and mast mounting outdoors. The PSI-GSM/UMTS-QB-ANT antenna is ideal for mounting on a control cabinet.

External antenna

Control cabinet antenna

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Multiband mobile communication antenna, with mounting bracket for outdoor installation, 5 m antenna cable with SMA circular connector, dimensions: 82 mm x 48 mm	TC ANT MOBILE WALL 5M	2702273	1			
Multiband antenna for UMTS and quad band GSM, with omnidirectional characteristic, 2 m antenna cable with SMA round connector, degree of protection: IP65, dimensions: 76 x 20 mm				PSI-GSM/UMTS-QB-ANT	2313371	1
	Accessories			**Accessories**		
Antenna extension cable for UMTS and quad-band GSM, with SMA plug and SMA coupling						
5 m long	PSI-CAB-GSM/UMTS- 5M	2900980	1	PSI-CAB-GSM/UMTS- 5M	2900980	1
10 m long	PSI-CAB-GSM/UMTS-10M	2900981	1	PSI-CAB-GSM/UMTS-10M	2900981	1

Surge protection

Mobile communication surge protection

– For GSM networks with 850 MHz, 900 MHz, 1800 MHz, and 1900 MHz as well as UMTS networks

SHDSL surge protection

– For broadband communication devices

For GSM systems (0.8 GHz - 2.25 GHz), grounded shield, connection: SMA

Attachment plug for two VDSL interfaces (ports)

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Surge protection for UMTS and quad-band GSM antenna, with SMA plug and SMA coupling	CSMA-LAMBDA/4-2.0-BS-SET	2800491	1			
DATATRAB, protective adapter for insertion in the data cable				DT-TELE-RJ45	2882925	1

Remote control – protocol converters

The **RESYGATE 1000/3000** protocol converter enables the process connection of remote control stations with different protocols to an IEC 60870-5-101 or IEC 60870-5-104-based control system.

The IEC 60870-5-104, IEC 60870-5-101, Modbus/RTU, and Modbus/TCP protocols are supported for the connection of remote control stations.

The individual protocols are parameterized and set via user-friendly interfaces in the configuration tool.

Features:

- Connection of existing IEC 60870-5-101 and/or Modbus remote control stations when upgrading the control system to the IEC 60870-5-104 protocol
- High availability of the overall system thanks to redundant connection
- Conversion of the IEC 60870-5-104, IEC 60870-5-101, Modbus/RTU, and Modbus/TCP protocols to the IEC 60870-5-104 or IEC 60870-5-101 protocol
- Up to 18 serial terminal devices can be used depending on the protocols used

Technical data

		RESYGATE 1000	RESYGATE 3000
Computer data			
Processor		Intel® Atom™ N455 1.66 GHz	Intel® Celeron® N2930 1.83 GHz/2.16 GHz
RAM (configuration option)		2 GB DDR3 SODIMM	
Mass storage (configuration option)		CompactFlash®, 4 GB	4 GB CFast® card
Interfaces		1x COM (RS-232/422/485) 2x COM (RS-232) 4x USB 2.0	1x COM (RS-232/422/485) 2x COM (RS-232) 3x USB 2.0 1x USB 3.0
Slots		without slots	
Monitor output		1x VGA	2x DisplayPort
Network		2x Ethernet (10/100/1000 Mbps), RJ45	
Power supply		24 V DC ±20 %	
Supported remote control protocols		IEC 60870–5–101 Balanced Mode IEC 60870–5–101 Unbalanced Mode IEC 60870–5–104 Client IEC 60870–5–104 Server, max. 4 Client Modbus RTU Master Modbus TCP Master	
General data			
Dimensions	W / H / D	155 mm / 145 mm / 49 mm	162 mm / 146.2 mm / 49 mm
Degree of protection		IP20	
Ambient temperature (operation)		0 °C ... 50 °C	-20 °C ... 50 °C
Permissible humidity (operation)		5 % ... 95 % (non-condensing)	
Mounting type		DIN rail mounting	
Vibration (operation)		DIN EN 60068-2-6	
Shock		15g, 11 ms in accordance with IEC 60068-2-27	
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Protocol converter			
- for a maximum of 500 data points	**RESYGATE 1000**	2400128	1
- for a maximum of 4000 data points	**RESYGATE 3000**	2400129	1

SUBCON.../SUBCON-PLUS...
D-SUB fast connector

M12 connection technology

The SUBCON-PLUS-M12 fieldbus connectors combine the D-SUB connection typically used for IP20 with the M12 connector. This connector has long been used with IP65 modules.

High EMC shielding effect

The connector range SUBCON-..., trimmed to the smallest dimensions, provides high shielding against EMC influences in industrial environments by virtue of its metallic housing.

Convenient connection technology

An idea has taken hold - absolutely no soldering or crimping tools: the D-SUB connectors, SUBCON... can be connected quickly and conveniently in field conditions. The plug contacts are clearly routed onto consecutively numbered screw terminal blocks. This means clarity during wiring and it simplifies every startup.

Optional cable infeed

The connection block can be inserted in either the upper or lower shell. This allows the cable to be fed in at 0° to 90° from right or left.

This allows on-site configuration of the cable infeed and requires only an order number with the order.

A wide product range

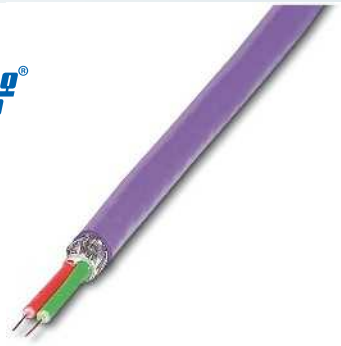
Irrespective of whether the application requires 9, 15 or 25-pos. plugs with one or two cable entries for point-to-point or RS-485 bus connections, a suitable version is available for each and every application. Optimized designs for PROFIBUS, CANopen® and SafetyBUSp with the right cables and tools complete the comprehensive range.

Customer-specific solutions

Does your application need an exclusive solution? We would be pleased to provide you with an offer using our know-how. Of course, space can be made for your own company logo in the plastic parts.

PROFIBUS cables and fast connection tool for SUBCON-PLUS-PROFIBUS

If the Fast Connect cable PSM-CABLE-PROFIB/FC is used, work is reduced to a minimum by using the quick stripping tool, **PSM-STRIP-FC/PROFIB**:
– strip cables and individual wires
– insert them into the plug, and
– close the housing cover.



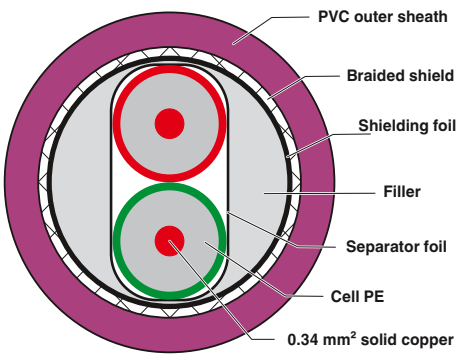
PROFIBUS cable, type Fast Connect

Quick stripping tool for SUBCON-PLUS-PROFIBUS connectors

EAC

	Technical data	Technical data
General data		
External cable diameter	8 mm ±0.4 mm	-
Ambient temperature (operation)	-40 °C ... 60 °C	-
Loop resistance	≤ 110 Ω (per km)	-
Cable capacity	approx. 28.5 nF/km (at 1 kHz)	-
Cable impedance	150 Ω ±10 % (3 ... 20 MHz)	-
Conductor material	Bare Cu wire	-
AWG signal line	22	-
Cable cross section	2x 0.34 mm²	-
Outer sheath, material	PVC FR VI	-
External sheath, color	Violet	-
Flame resistance	according to IEC 60332-3-24 (Cat. C) according to CMG FT4	-
Resistance to oil	Limited resistance to mineral oils and greases according to IEC 60811-2-1, 4 h at 70°C	-
Cable type	PROFIBUS in acc. with IEC 61158, Type A	-
Operations per knife block	-	PUR cable: max. 300 per knife block PVC cable: max. 3000 per knife block

		Ordering data			Ordering data		
Description		Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
PROFIBUS cable, Fast Connect type, up to 12 Mbps, for permanent connection (02YSY (ST)CY 1X2X22 AWG) (Length in meters as per customer specifications)		PSM-CABLE-PROFIB/FC	2744652	1			
Quick stripping tool for PROFIBUS cable, Fast Connect type					PSM-STRIP-FC/PROFIB	2744623	1
		Accessories			Accessories		
Spare knife block for quick stripping tool	blue				PSM-STRIP-KNIFEBLOCK	2744636	1
Stripping tool, for conductors and cables	black	QUICK WIREFOX 6	1204384	1	QUICK WIREFOX 6	1204384	1



SUBCON-PLUS-M12-fast connector

The SUBCON-PLUS fast connectors with M12 connection ensure error-free installation of bus systems, thanks to the use of fully-tested components such as cables and connectors.

The innovative housing concept is lightweight yet offers optimum mechanical protection against environmental influences. This means that the fast connectors are ideal, even in applications subject to vibration.

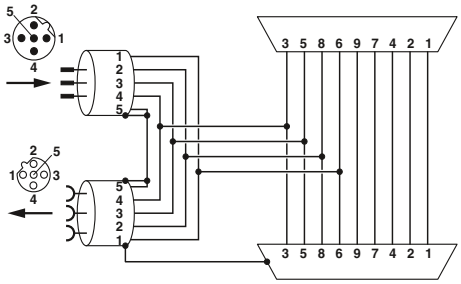
The unique SPEEDCON fast locking system on the M12 connections offers reliable connection with just half a turn.

Features:

- Easy startup, plug and play
- Low weight
- Termination using M12 termination resistor
- Adapter between IP20 and IP67 environments
- For PROFIBUS and CANopen® systems

Advantages:

- Direct connection of M12 cables
- Complete range with versions for every application
- Problem-free installation, thanks to 100% tested individual components
- Fully molded housing
- M12-SPEEDCON locking, connected securely with just half a turn



SUBCON-PLUS-PROFIB/...M12 function block diagram

90° version, long,
Suitable for Siemens S7

Technical data

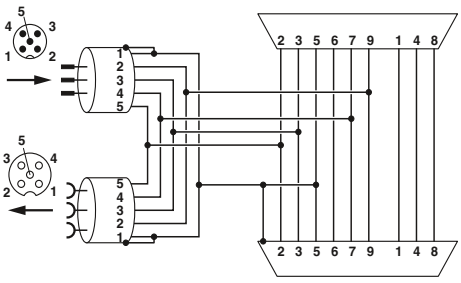
General data	
Cable entry	90° (left)
Ambient temperature (operation)	-30 °C ... 80 °C
Degree of protection	IP40
Housing material	Polyamide
Number of positions	5
Termination resistor	separately via M12 termination resistor
SUBCON fixing	4-40 UNC 0.4 Nm
Dimensions W / H / D	16 mm / 41 mm / 93 mm

Ordering data

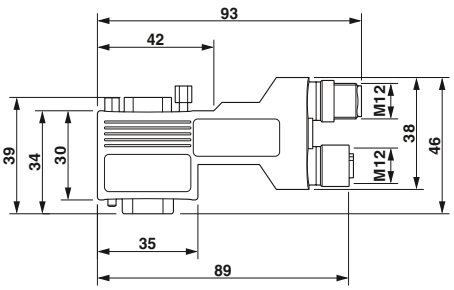
Description	Type	Order No.	Pcs./Pkt.
Fast connectors, for PROFIBUS systems, Pin assignment 3, 5, 6, 8			
- Standard version	SUBCON-PLUS-PROFIB/90X/M12	2902729	1
- Pg version with programming connection	SUBCON-PLUS-PROFIB/90X/PG/M12	2902728	1
Fast connectors, for CAN-based systems, Pin assignment 2, 3, 5, 7, 9			
- Standard version	SUBCON-PLUS-CAN/90X/M12	2902731	1
- Pg version with programming connection	SUBCON-PLUS-CAN/90X/PG/M12	2902730	1

Accessories

Termination resistor, M12 connector			
- PROFIBUS	SAC-5P-M12MS PB TR	1507803	5
- M12 socket design	SAC-5P-M12FS PB TR	1403911	5
Bus cable PROFIBUS, straight socket, shielded, M12 B-coded, 2-pos., straight pin, shielded, M12 B-coded, 2-pos.			
- Cable length 1 m	SAC-2P-MSB/ 1,0-910/FSB SCO	1518122	1
- Variable cable length	SAC-2P-MSB-FSB SCO/910/...	1538092	1
Termination resistor, M12 connector			
- DeviceNet™/CANopen®	SAC-5P-M12MS CAN TR	1507816	5
- M12 socket design	SAC-5P-M12FS CAN TR	1529344	5
Bus cable DeviceNet™/CANopen, straight socket, shielded, M12 A-coded, 5-pos., straight pin, shielded, M12 A-coded, 5-pos.			
- Cable length 1 m	SAC-5P-MS/ 1,0-920/FS SCO	1518274	1
- Variable cable length	SAC-5P-MS-FS SCO/920/...	1538157	1



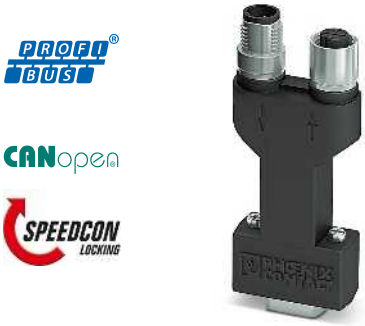
SUBCON-PLUS-CAN/...M12 function block diagram



SUBCON-PLUS...90X...M12 dimensional drawing, long 90° version

90° version, short, universal

35° version, universal



Axial version, universal

Technical data	
90° (left)	
-30 °C ... 80 °C	
IP40	
Polyamide	
5	
separately via M12 termination resistor	
4-40 UNC 0.4 Nm	
16 mm / 40 mm / 71 mm	

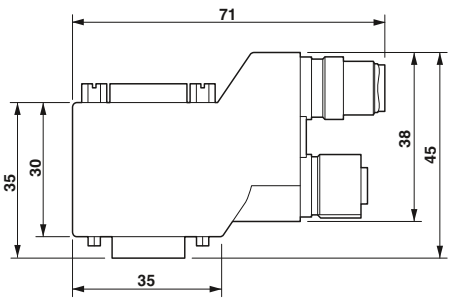
Ordering data		
Type	**Order No.**	Pcs./Pkt.
SUBCON-PLUS-PROFIB/90/M12	2902318	1
SUBCON-PLUS-PROFIB/90/PG/M12	2902317	1
SUBCON-PLUS-CAN/90/M12	2902323	1
SUBCON-PLUS-CAN/90/PG/M12	2902322	1
Accessories		
SAC-5P-M12MS PB TR	1507803	5
SAC-5P-M12FS PB TR	1403911	5
SAC-2P-MSB/ 1,0-910/FSB SCO	1518122	1
SAC-2P-MSB-FSB SCO/910/...	1538092	1
SAC-5P-M12MS CAN TR	1507816	5
SAC-5P-M12FS CAN TR	1529344	5
SAC-5P-MS/ 1,0-920/FS SCO	1518274	1
SAC-5P-MS-FS SCO/920/...	1538157	1

Technical data	
35° (left)	
-30 °C ... 80 °C	
IP40	
Polyamide	
5	
separately via M12 termination resistor	
4-40 UNC 0.4 Nm	
16 mm / 46 mm / 79 mm	

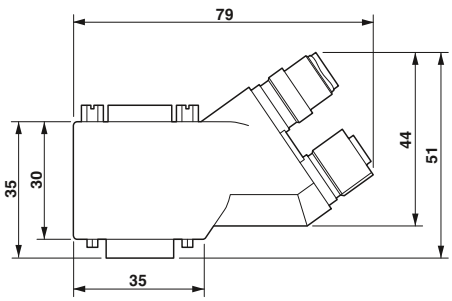
Ordering data		
Type	**Order No.**	Pcs./Pkt.
SUBCON-PLUS-PROFIB/35/M12	2902320	1
SUBCON-PLUS-PROFIB/35/PG/M12	2902319	1
SUBCON-PLUS-CAN/35/M12	2902325	1
SUBCON-PLUS-CAN/35/PG/M12	2902324	1
Accessories		
SAC-5P-M12MS PB TR	1507803	5
SAC-5P-M12FS PB TR	1403911	5
SAC-2P-MSB/ 1,0-910/FSB SCO	1518122	1
SAC-2P-MSB-FSB SCO/910/...	1538092	1
SAC-5P-M12MS CAN TR	1507816	5
SAC-5P-M12FS CAN TR	1529344	5
SAC-5P-MS/ 1,0-920/FS SCO	1518274	1
SAC-5P-MS-FS SCO/920/...	1538157	1

Technical data	
180° (axial)	
-30 °C ... 80 °C	
IP40	
Polyamide	
5	
separately via M12 termination resistor	
4-40 UNC 0.4 Nm	
16 mm / 75 mm / 38 mm	

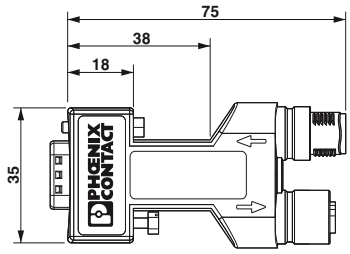
Ordering data		
Type	**Order No.**	Pcs./Pkt.
SUBCON-PLUS-PROFIB/AX/M12	2902321	1
SUBCON-PLUS-CAN/AX/M12	2902326	1
Accessories		
SAC-5P-M12MS PB TR	1507803	5
SAC-5P-M12FS PB TR	1403911	5
SAC-2P-MSB/ 1,0-910/FSB SCO	1518122	1
SAC-2P-MSB-FSB SCO/910/...	1538092	1
SAC-5P-M12MS CAN TR	1507816	5
SAC-5P-M12FS CAN TR	1529344	5
SAC-5P-MS/ 1,0-920/FS SCO	1518274	1
SAC-5P-MS-FS SCO/920/...	1538157	1



SUBCON-PLUS...90...M12 dimensional drawing, short 90° version



SUBCON-PLUS...35...M12 dimensional drawing, 35° version



SUBCON-PLUS...AX...M12 dimensional drawing, axial (180°) version

SUBCON-PLUS-PROFIBUS
D-SUB fast connector

PROFIBUS plugs with fast connection

The D-SUB series, **SUBCON-PLUS-PROFIB/...** was specially designed for use in PROFIBUS systems up to 12 Mbps. Under field conditions, it allows convenient and fast connection of the incoming and outgoing bus cable.

The product range includes nine fast connectors - the perfect solution for every PROFIBUS application:

– 35° and 90° angled cable entry
– Axial cable entry
– With an additional programming interface
– Integrated surge protection

The plugs can be used for PROFIBUS cables with massive as well as with stranded copper wires.

The termination resistor is already integrated in all versions. It can be connected externally by means of a slide switch. At the same time, the outgoing bus segment is switched off. This makes it easy to start up segment by segment while incorrect terminations are avoided.

In addition, the connector housing with high-quality shielding guarantees high immunity to interference even at maximum transmission speeds.

A special feature of the 35° angled connector is that the internal connection unit can be turned round. Whether the cable is to be inserted from the right or left can thus be decided on-site.

If it is not possible to use the angled version, the SUBCON-PLUS.../AX compact plug with axial cable entry can be used instead.

The plugs are designed to be used for all standard PROFIBUS cables with 8 mm external diameter (types A and B).

35° PROFIBUS connector, screw connection, reversible cable entry

Ex:

Technical data

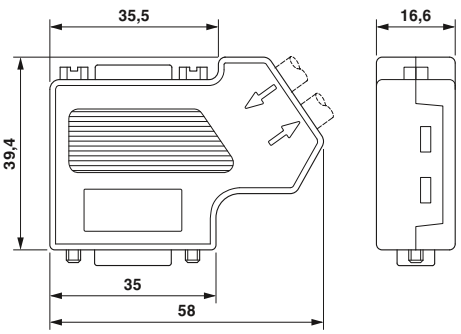
General data	
Cable entry	35° (right or left)
Connection cross section (solid / stranded / AWG)	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
Insertion/withdrawal cycles	> 200
Cable cross section (max./min.)	8.4 mm / 7.6 mm
Ambient temperature (operation)	-20 °C ... 75 °C
Degree of protection	IP40
Housing material	ABS, metal-plated
Termination resistor	390 Ω / 220 Ω / 390 Ω (Can be connected externally)
SUBCON fixing	4-40 UNC 0.4 Nm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
PROFIBUS connector, up to 12 Mbps, integrated termination resistor which can be activated externally, 9-pos. connector, pin assignment 3, 5, 6, 8			
- Angled 35°, screw connection	**SUBCON-PLUS-PROFIB/SC2**	2708232	1
- Angled 35°, screw connection with second D-SUB socket	**SUBCON-PLUS-PROFIB/PG/SC2**	2708245	1
- Angled 35°, screw connection, with surge protection	**D-UFB-PB**	2880642	1
- Angled 90°, screw connection			
- Angled 90°, screw connection with second D-SUB socket			
- Angled 90°, IDC connection			
- Angled 90°, IDC connection with second D-SUB socket			
- Axial cable entry, screw connection			
- Axial cable entry, spring connection			

Accessories

PROFIBUS cable, Fast Connect type, up to 12 Mbps, for permanent connection (02YSY (ST)CY 1X2X22 AWG) (Length in meters as per customer specifications)	**PSM-CABLE-PROFIB/FC**	2744652	1
Quick stripping tool for PROFIBUS cable, Fast Connect type	**PSM-STRIP-FC/PROFIB**	2744623	1



90° PROFIBUS connector, screw connection

Ex:

Technical data

90° (left)
0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
> 200
8.4 mm / 7.6 mm
-20 °C ... 75 °C
IP40
ABS, metal-plated
390 Ω / 220 Ω / 390 Ω (Can be connected externally)
4-40 UNC 0.4 Nm

Ordering data

Type	Order No.	Pcs./Pkt.
SUBCON-PLUS-PROFIB/90/SC	2313698	1
SUBCON-PLUS-PROFIB/90/PG/SC	2313708	1

Accessories

PSM-CABLE-PROFIB/FC	2744652	1
PSM-STRIP-FC/PROFIB	2744623	1

90° PROFIBUS connector, IDC insulation displacement connection method

Technical data

90° (left)
0.32 - 1 mm² / 0.32 - 1 mm² / 22 - 18
> 200
8.4 mm / 7.6 mm
-20 °C ... 75 °C
IP40
ABS, metal-plated
390 Ω / 220 Ω / 390 Ω (Can be connected externally)
4-40 UNC 0.4 Nm

Ordering data

Type	Order No.	Pcs./Pkt.
SUBCON-PLUS-PROFIB/90/IDC	2313672	1
SUBCON-PLUS-PROFIB/90/PG/IDC	2313685	1

Accessories

PSM-CABLE-PROFIB/FC	2744652	1
PSM-STRIP-FC/PROFIB	2744623	1

Axial PROFIBUS connector, screw or spring connection

Ex:

Technical data

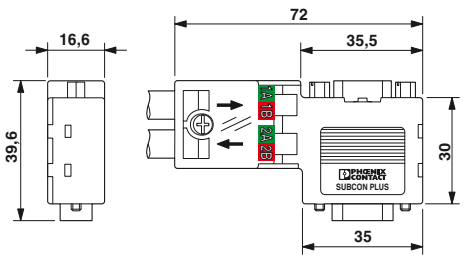
180° (axial)
0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
> 200
8.4 mm / 7.6 mm
-20 °C ... 75 °C
IP40
ABS, metal-plated
390 Ω / 220 Ω / 390 Ω (Can be connected externally)
4-40 UNC 0.4 Nm

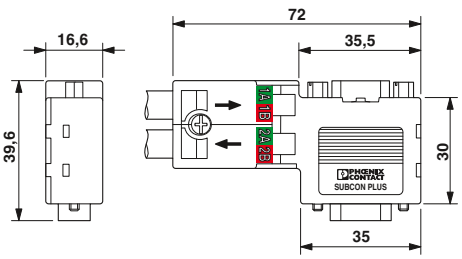
Ordering data

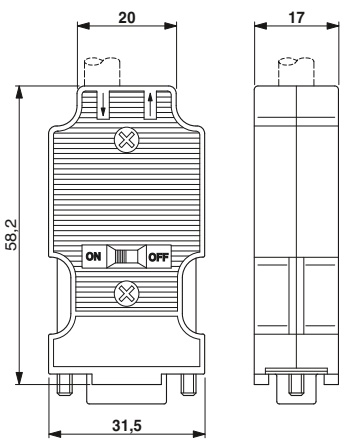
Type	Order No.	Pcs./Pkt.
SUBCON-PLUS-PROFIB/AX/SC	2744380	1
SUBCON-PLUS-PROFIB/AX	2744377	1

Accessories

PSM-CABLE-PROFIB/FC	2744652	1
PSM-STRIP-FC/PROFIB	2744623	1







SUBCON-PLUS-CAN
D-SUB fast connector

The SUBCON-PLUS-CAN/... D-SUB series is specially designed for use in CAN systems. Under field conditions, it enables the quick and easy connection of the incoming and outgoing bus cable.

The termination resistor is already integrated in all versions. It can be connected externally by means of a slide switch. At the same time, the outgoing bus segment is switched off. This makes it easy to start up segment by segment while incorrect terminations are avoided. In addition, the connector housing with high-quality shielding guarantees high immunity to interference even at maximum transmission speeds.

A special feature of the angled plug is that the internal connection unit can be turned round. Whether the cable is to be inserted from the right or left can thus be decided on-site. If it is not possible to use the angled design, a compact plug with axial cable entry is available with the SUBCON-PLUS-CAN/AX type.

Features:
– Assembly under field conditions
– Separate terminal blocks for bus cables
– Termination resistor can be connected
– Segment-by-segment startup
– High transmission speed
– High level of EMC
– Flexibility in terms of cable entry selection
– Suitable for bus cables as per the CiA Draft Recommendation 303-1 with an outside diameter of 8 mm
– For special cables, there is a version with a variable cable entry

Versions:
– Angled with programming interface
– Angled without programming interface
– Axial cable entry

35° D-SUB connector (female), screw connection, two cable entries

Ex:

Technical data

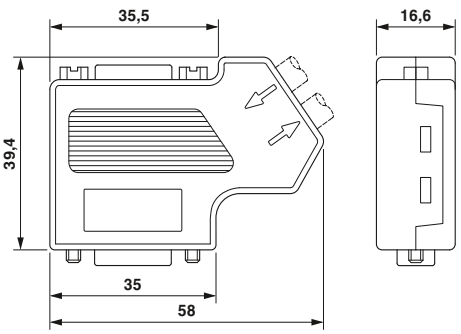
General data	
Cable entry	35° (right or left)
Pin assignment	2, 3, 7, 9
Nominal voltage U_N	5 V
Nominal current I_N	100 mA
Connection cross section (solid / stranded / AWG)	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
Insertion/withdrawal cycles	> 200
Cable cross section (max./min.)	8.4 mm / 7.6 mm
Ambient temperature (operation)	-20 °C ... 75 °C
Degree of protection	IP40
Housing material	ABS, metal-plated
Termination resistor	120 Ω (Can be connected externally)
SUBCON fixing	4-40 UNC 0.4 Nm

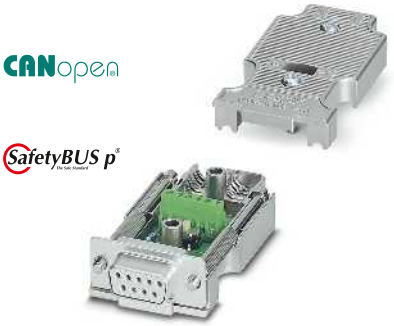
Ordering data

Description	Type	Order No.	Pcs./Pkt.
CAN, CANopen, SafetyBUS p connector, integrated termination resistor that can be activated from the outside, with screw connection, 9-pos., socket			
- 35° angled	**SUBCON-PLUS-CAN/SC2**	2708999	1
- Angled 35°, with second D-SUB connection	**SUBCON-PLUS-CAN/PG**	2708119	1
- Angled 35°, for variable cable diameters			
CAN, CANopen, SafetyBUS p connector, integrated termination resistor that can be activated from the outside, with screw connection, 9-pos., socket - axial cable entry			

Accessories

Screwdriver	**SZS 0,4X2,5 VDE**	1205037	10





35° D-SUB connector (female), variable cable diameter

Ex:

Technical data

35° (right or left)	
2, 3, 7	
5 V	
100 mA	
0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16	
> 200	
10 mm / 6 mm	
-20 °C ... 75 °C	
IP40	
ABS, metal-plated	
120 Ω (Can be connected externally)	
4-40 UNC 0.4 Nm	

Ordering data

Type	Order No.	Pcs./Pkt.
SUBCON-PLUS-CAN	2744694	1

Accessories

SZS 0,4X2,5 VDE	1205037	10

Axial D-SUB connector (female), two cable entries

Ex:

Technical data

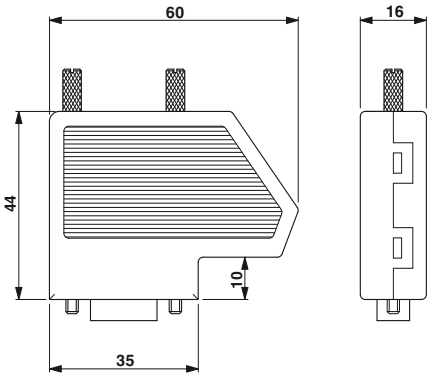
180° (axial)	
2, 3, 7	
5 V	
100 mA	
0.14 - 0.5 mm² / 0.14 - 0.5 mm² / 26 - 20	
> 200	
8.4 mm / 7.6 mm	
-20 °C ... 75 °C	
IP40	
ABS, metal-plated	
120 Ω (Can be connected externally)	
4-40 UNC 0.4 Nm	

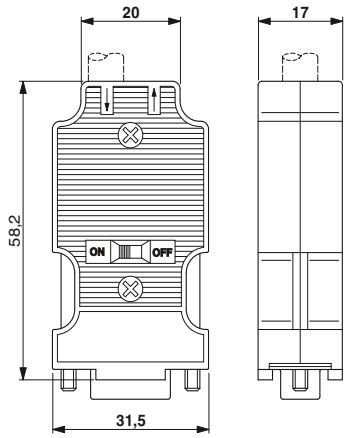
Ordering data

Type	Order No.	Pcs./Pkt.
SUBCON-PLUS-CAN/AX	2306566	1

Accessories

SZS 0,4X2,5 VDE	1205037	10





SUBCON-PLUS
D-SUB fast connector

Field bus connector with screw connection

Two cable infeeds are often required on the D-SUB connectors used in order to build fieldbus systems with RS-485 interfaces. The SUBCON-PLUS plugs range fulfills this requirement and routes the connection to screw terminal blocks – however, duplicated – for two cables. This means clarity during wiring and it simplifies every startup. These plugs are of course also shielded against EMC influences with a metallized housing. In addition, by placing the connection block in either the upper or lower shell, it is possible to select the cable infeed on site from the right or left.

Features:

– For universal use
– Assembly under field conditions
– Separate terminal blocks for each cable
– High transmission speed
– High level of EMC
– Flexibility in terms of cable entry selection
– Straightforward assembly thanks to knurled screws

Versions:

– Bus-specific types with matching partial assignment
– Universal type with full assignment
– Short mounting screw as an accessory for when space is at a premium

RS-485

Modbus

With two cable entries, 35° angled and axial

Ex:

Technical data

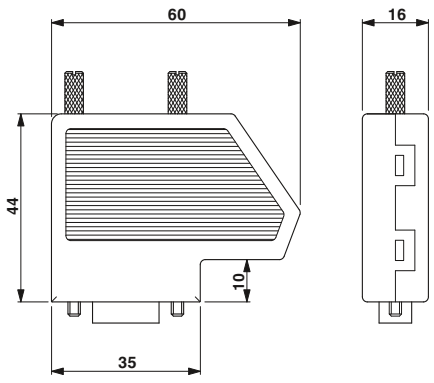
Nominal voltage U_N	50 V
Nominal current I_N	100 mA
Connection cross section (solid / stranded / AWG)	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
Insertion/withdrawal cycles	> 200
Cable cross section (max./min.)	10 mm / 6 mm
Ambient temperature (operation)	-20 °C ... 75 °C
Degree of protection	IP20
Housing material	ABS, metal-plated
SUBCON fixing	4-40 UNC 0.4 Nm

Ordering data

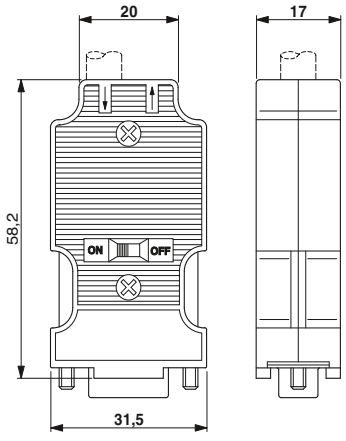
Description	Type	Order No.	Pcs./Pkt.
D-SUB connector, with **two** cable entries for MODBUS, MODBUS-PLUS, BITBUS, ARCNET, MULT/MININET (B&R), SYSTEM 2003 (B&R), P-NET, pin assignment 1,2,3,5,6,8			
- Angled 35°, 9-pos., pin	**SUBCON-PLUS M1**	2761826	1
- Angled 35°, 9-pos., socket	**SUBCON-PLUS F1**	2744267	1
D-SUB connector, with **two** cable entries for SUCONET K1, K2 (EATON/Moeller), S-BUS (Saia), J-BUS (Merlin Gerin), pin assignment 2, 3, 4, 5, 7, 9			
- Angled 35°, 9-pos., pin	**SUBCON-PLUS M2**	2761839	1
- Angled 35°, 9-pos., socket	**SUBCON-PLUS F2**	2799490	1
D-SUB connector, with **two** cable entries for MODBUS, CEGELEC, pin assignment 1,1,2,3,6,7			
- Angled 35°, 9-pos., socket	**SUBCON-PLUS F5**	2744102	1
D-SUB connector, with **two** cable entries, **universal type**, pin assignment 1,2,3,4,5,6,7,8,9 on **every** screw terminal block			
- Angled 35°, 9-pos., pin	**SUBCON-PLUS 9/M**	2744018	1
- Angled 35°, 9-pos., socket	**SUBCON-PLUS 9/F**	2744241	1
- Axial, 9-pos., pin	**SUBCON-PLUS-M/AX 9**	2904467	1
- Axial, 9-pos., socket	**SUBCON-PLUS-F/AX 9**	2311797	1

Accessories

Optional mounting screw, short (without knurl)	**SUBCON-SHORT-SCREW**	2799694	1
Screwdriver	**SZS 0,4X2,5 VDE**	1205037	10



Dimensional drawing SUBCON-PLUS...



Dimensional drawing SUBCON-PLUS-.../AX...

SUBCON
D-SUB fast connector

The 9-pos. version of the SUBCON-... connector range is not just suitable for INTERBUS, but is positively ideal. A whole host of further applications are opened up by having all the connections assigned to their own 1 mm² screw terminal block.

The range covers SUBCON plugs for point-to-point connections with a cable infeed in 9, 15 and 25-pos. male or female versions.

Installing the connection block either in the upper or lower shell makes it possible to introduce the cable at an angle of 0° to 90° from the right or the left. The completely metallized housing also ensures a high degree of shielding against EMC influences.

The optional fastening screw SUBCON-SHORT-SCREW is available as an accessory for narrow installation conditions. The screw is completely integrated into the housing by not having a knurl.

Features:
– For universal use
– Assembly under field conditions
– High level of EMC
– Flexibility in terms of cable entry selection
– Straightforward assembly thanks to knurled screws

Versions:
– 9-, 15-, and 25-pos. versions
– Short mounting screw as an accessory for when space is at a premium

with one cable entry

Ex:

Technical data

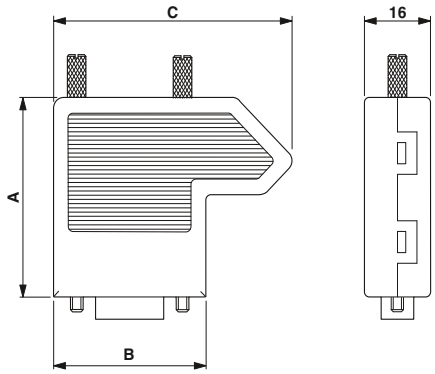
General data	
Cable entry	35° (right or left)
Pin assignment	All connections are 1:1 on the screw terminal block
Nominal voltage U_N	50 V
Nominal current I_N	100 mA
Connection cross section (solid / stranded / AWG)	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
Insertion/withdrawal cycles	> 200
Cable cross section (max./min.)	10 mm / 4 mm
Ambient temperature (operation)	-20 °C ... 75 °C
Degree of protection	IP20
Housing material	ABS, metal-plated
SUBCON fixing	4-40 UNC 0.4 Nm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
D-SUB connector, with screw connection			
- 9-pos., socket	**SUBCON 9/F-SH**	2761499	1
- 9-pos., pin	**SUBCON 9/M-SH**	2761509	1
D-SUB connector, with screw connection			
- 15-pos., socket	**SUBCON 15/F-SH**	2761596	1
- 15-pos., pin	**SUBCON 15/M-SH**	2761606	1
D-SUB connector, with screw connection			
- 25-pos., socket	**SUBCON 25/F-SH**	2761619	1
- 25-pos., pin	**SUBCON 25/M-SH**	2761622	1

Accessories

Optional mounting screw, short (without knurl)	**SUBCON-SHORT-SCREW**	2799694	1
Screwdriver	**SZS 0,4X2,5 VDE**	1205037	10



SUBCON...-SH dimensional drawing

Dimensions of the D-SUB connectors (SUBCON)

	A [mm]	B [mm]	C [mm]
9-pos.	44.5	36.0	56.4
15-pos.	44.5	44.3	64.7
25-pos.	49.5	58.0	78.7

RS-232 cables

A permanent cause of annoyance are the two connection standards, 9 and 25-pin for the RS-232 interface. The plug-in "9 to 25-pos." D-SUB adapters solve the problem without complicated resoldering of the cable connections.

The 0.5 and 2 meter standard RS-232 cables can be used to connect the rail-mountable control cabinet modules. Individual lengths can be created quickly and simply with the screw-type D-SUB connector, SUBCON.

Null modem adapter

In order to connect two RS-232 interfaces of the same type, the zero modem plug crosses the data and control lines.

Thanks to the small "Gender Changer" type, it can be plugged at any interface directly and thus does not change the existing connector design through the socket/connector combination.

RS-232 connecting cable

Ordering data

Description	Type	Order No.	Pcs./Pkt.
RS-232-D-SUB cable, length: 0.5 m - 9-pos. socket on 9-pos. socket	PSM-KA9SUB9/BB/0,5METER	2708520	1
RS-232-D-SUB cable, length: 2 m - 9-pos. socket on 9-pos. socket	PSM-KA9SUB9/BB/2METER	2799474	1
RS-232-D-SUB cable, length: 2 m - 9-pos. socket on 25-pos. socket	PSM-KA 9 SUB 25/BB/2METER	2761059	1

Accessories

RS-232 null modem adapter - 9-pos. socket to 9-pos. connector	PSM-AD-D9-NULLMODEM	2708753	1
D-SUB gender changer			
- 9-pos., pin/pin	VS-09-GC-ST/ST	1652651	10
- 9-pos., socket/socket	VS-09-GC-BU/BU	1688722	10
- 25-pos., pin/pin	VS-25-GC-ST/ST	1652693	10
- 25-pos., socket/socket	VS-25-GC-BU/BU	1652680	10

USB cable adapter

Two adapter cables with a length of 1 m and 3 m are available for connecting controllers, PCs and other automation devices with USB-A connections to devices with Mini-USB-B connections.

USB cable (USB-A to mini-USB)

Ordering data

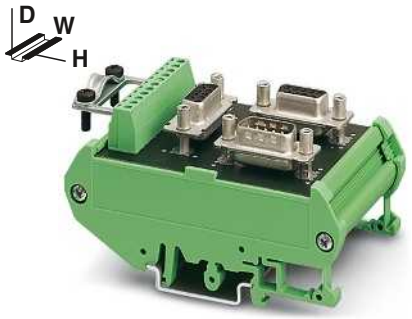
Description	Type	Order No.	Pcs./Pkt.
USB cable, from USB-A to Mini-USB-B, 5-pos. - Length: 1 m	PSI-CA-USB A/MINI B/1METER	2313575	1
USB connecting cable (individual) for configuration - Length: 3 m	CABLE-USB/MINI-USB-3,0M	2986135	1
USB cable, for diagnostics and extended configuration	RAD-CABLE-USB	2903447	1

RS-485 connection distributor

If branch line connections or a star distribution are to be made in a bus system, the RS-485 connection distributors come to your aid.

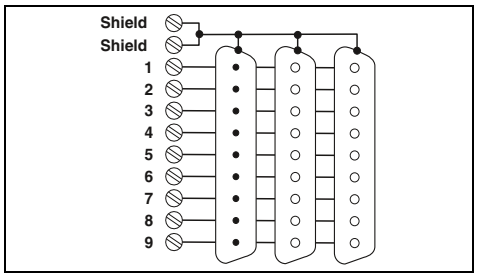
PSM-PTK, the DIN rail-mountable T-adapter equipped with three 9-pin 1:1 connected D-SUB connections, makes for clear and tidy wiring with just one branch line connection.

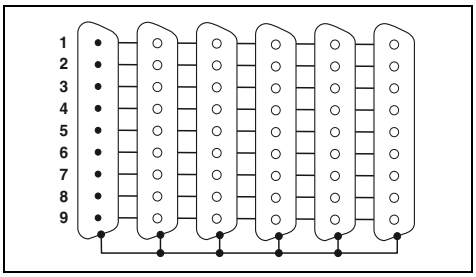
As many as four branch lines can be picked off from one bus line in the PSM-PTK 4 version. Here too, all six D-SUB connections (9-pos.) are connected through 1:1. Both versions are mounted by snapping them onto conventional EN DIN rails.



RS-485 T-distributor (4-way), D-SUB and screw connection

RS-485 T-distributor (6-way), D-SUB connection





Technical data

General data		
Plug-in connection	Incoming	D-SUB 9 connector
	Outgoing	D-SUB-9 socket
	Branching	D-SUB-9 socket
		COMBICON connectors
Nominal voltage U_N		60 V AC/DC
Nominal current I_N		1 A
Test voltage		500 V AC (50 Hz, 1 min, rms)
Shield connection		D-SUB frame or shield clip
Connection cross section (solid / stranded / AWG)		0.14 - 1.5 mm² / 0.14 - 1.5 mm² / 26 - 16
Torque		0.4 Nm
Ambient temperature (operation)		-25 °C ... 70 °C
Housing material		PVC
Pin assignment		all 1:1
Dimensions W/H/D		56 mm / 89.6 mm / 48 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Passive RS-485 T-distributor, fitted with a 9 pos. D-SUB pin strip and **two** 9-pos. D-SUB socket strips, as well as a 9-pos. PCB terminal block with shield clip.	**PSM PTK**	2760623	1

Accessories

Screwdriver	**SZS 0,4X2,5 VDE**	1205037	10

Technical data

General data		
Plug-in connection	Incoming	D-SUB 9 connector
	Outgoing	D-SUB-9 socket
	Branching	4 x D-SUB-9 socket
		-
Nominal voltage U_N		60 V AC/DC
Nominal current I_N		1 A
Test voltage		500 V AC (50 Hz, 1 min, rms)
Shield connection		D-SUB frame
Connection cross section (solid / stranded / AWG)		-
Torque		-
Ambient temperature (operation)		-25 °C ... 70 °C
Housing material		PVC
Pin assignment		all 1:1
Dimensions W/H/D		89.8 mm / 89.6 mm / 39 mm

Ordering data

Type	Order No.	Pcs./Pkt.
PSM PTK-4	2799364	1

Accessories

SZS 0,4X2,5 VDE	1205037	10

US1 US2 FAIL
Mode
ACT SPD FD
Net Mod
EIP
X9
LNK
X1
MOD
X2
X3
X4
X5
X6
X7
X8
SWITCH 7000
PHOENIX CONTACT
X9
P1 Stat Mod Sig
P2 Err Fault Info
X1 WAN
X2 LAN
X6 Configuration
mGuard rs2000
X4 MEM
D WLAN
C LAN 1
B LAN 2
A DI
FAIL US
MODE
WLAN 5100

Industrial Ethernet

Make the most of all the options offered by your Ethernet network.

Phoenix Contact offers you more realtime, more wireless, more safety, and more reliability.

Industrial Ethernet from Phoenix Contact can be easily integrated in your automation infrastructure - because we make Ethernet easy.

Benefit from our experience in automation which spans decades and the experience we have gained in industrial Ethernet networks over the past ten plus years.

We know and understand the expectations and demands placed on automation. This is evident and embodied in our products and solutions.

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Isolator for electrical isolation
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Patch panels

Passive mini patch panels with various connection options
Page 346

Standard Switches with basic functions

FL SWITCH SFNB... Unmanaged Switches are optimized for basic and entry level applications where low installed costs with full industrialization are required.

Features:

– 5 to 8 ports in a narrow, metal housing
– Optional SC and ST fiber optic ports
– For longer distances, multi mode and single-mode fiber connections are available
– RJ45 ports provide 10/100 Mbps speeds; fiber optic ports operate at 100 Mbps
– Auto negotiation and autocross recognition provide easy installation and setup
– LED indicators provide local diagnostics
– Cable locking security options

Ethernet

5 RJ45 ports

Ex:

Technical data

Ethernet interface		
Number of ports		5 (RJ45 ports)
Transmission speed		10/100 Mbps
Fiber optic interface		
Number of ports		-
Transmission speed		-
Connection method		-
Wavelength		-
Transmission length		-
Function		
Basic functions		Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode
Status and diagnostic indicators		LEDs: U_S, link and activity per port
Power supply		
Supply voltage		24 V DC
Residual ripple		3.6 V_{PP}
Supply voltage range		12 V DC ... 48 V DC
Typical current consumption		185 mA (at U_S = 24 V DC)
General data		
Dimensions	W / H / D	28 mm / 110 mm / 70 mm
Degree of protection		IP20
Ambient temperature (operation)		-10 °C ... 60 °C
Permissible humidity (operation)		5 % ... 95 % (non-condensing)
Noise emission		EN 61000-6-4
Noise immunity		EN 61000-6-2
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet switch - 5 RJ45 ports - 8 RJ45 ports - 4 RJ45 ports, 1 SC FO port - 4 RJ45 ports, 1 ST FO port	**FL SWITCH SFNB 5TX**	2891001	1

Ethernet

8 RJ45 ports

Ex:

Technical data

8 (RJ45 ports)	
10/100 Mbps	
-	
-	
-	
-	
-	
Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode	
LEDs: U_S, link and activity per port	
24 V DC	
3.6 V_{PP}	
9 V DC ... 32 V DC	
140 mA (at U_S = 24 V DC)	
50 mm / 110 mm / 70 mm	
IP20	
-10 °C ... 60 °C	
5 % ... 95 % (non-condensing)	
EN 61000-6-4	
EN 61000-6-2:2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFNB 8TX	**2891002**	1

Ethernet

4 RJ45 ports and 1 fiber optic port (multi-mode)

Ex:

Technical data

	FL SWITCH SFNB 4TX/FX	FL SWITCH SFNB 4TX/FX ST
4 (RJ45 ports)		
10/100 Mbps		
1 (SC multi-mode)		1 (ST multi-mode)
100 Mbps (full duplex)		
SC		ST
1300 nm		
12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)		
Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode		
LEDs: U_S, link and activity per port		
24 V DC		
3.6 V_{PP}		
12 V DC ... 48 V DC		
185 mA (at U_S = 24 V DC)		175 mA (at U_S = 24 V DC)
28 mm / 110 mm / 70 mm		
IP20		
0 °C ... 60 °C		-10 °C ... 60 °C
5 % ... 95 % (non-condensing)		
EN 61000-6-4		
EN 61000-6-2		
Class A product, see page 525		

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFNB 4TX/FX	**2891027**	1
FL SWITCH SFNB 4TX/FX ST	**2891028**	1

Ethernet

4 RJ45 ports and 1 fiber optic port (single-mode)

Ex:

Technical data

4 (RJ45 ports)
10/100 Mbps
1 (SC single-mode)
100 Mbps (full duplex)
SC
1300 nm
25 km (fiberglass with F-G 9/125 0.5 dB/km)
Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode
LEDs: U_S, link and activity per port
24 V DC
3.6 V_{PP}
12 V DC ... 48 V DC
175 mA (at U_S = 24 V DC)
28 mm / 110 mm / 70 mm
IP20
-10 °C ... 60 °C
5 % ... 95 % (non-condensing)
EN 61000-6-4
EN 61000-6-2
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFNB 4TX/FX SM20	**2891029**	1

Standard Switches with up to 8 ports

FL SWITCH SFN... Unmanaged Switches have a wide range of configurations and features for general purpose applications.

Features:

– 5 to 8 ports in a narrow, metal housing
– Optional SC and ST fiber optic ports
– Quality of Service (QoS) prioritized messages
– RJ45 ports provide 10/100 Mbps speeds; fiber optic ports operate at 100 Mbps
– Auto negotiation and autocross recognition provide easy installation and setup
– LED indicators provide local diagnostics
– Switch-mounted cable locking and port blocking options

Ethernet

5/8 RJ45 ports for PROFINET

Technical data

		FL SWITCH SFN 5TX-PN	FL SWITCH SFN 8TX-PN
Ethernet interface			
Number of ports		5 (RJ45 ports)	8 (RJ45 ports)
Transmission speed		10/100 Mbps	
Fiber optic interface			
Number of ports		-	
Transmission speed		-	
Wavelength		-	
Transmission length		-	
		-	
Function			
Basic functions		Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode	
Status and diagnostic indicators		LEDs: U_S, link and activity per port	LEDs: U_{S1}, link and activity per port
Power supply			
Supply voltage		24 V DC	
Residual ripple		3.6 V_{PP}	
Supply voltage range		9 V DC ... 32 V DC	
Typical current consumption		typ. 90 mA (at U_S = 24 V DC)	typ. 140 mA (at U_S = 24 V DC)
General data			
Dimensions	W / H / D	30 mm / 130 mm / 100 mm	50 mm / 130 mm / 100 mm
Degree of protection		IP20	
Ambient temperature (operation)		0 °C ... 60 °C	
Permissible humidity (operation)		5 % ... 95 % (non-condensing)	
Noise emission		EN 61000-6-4	
Noise immunity		EN 61000-6-2:2005	
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet switch			
- 5 RJ45 ports	**FL SWITCH SFN 5TX-PN**	2891151	1
- 8 RJ45 ports	**FL SWITCH SFN 8TX-PN**	2891018	1
- 8 RJ45 ports, flow control disabled			
- 4 RJ45 ports, 1 SC FO port			
- 4 RJ45 ports, 1 ST FO port			
- 7 RJ45 ports, 1 SC FO port			
- 7 RJ45 ports, 1 ST FO port			
- 7 RJ45 ports, 1 SC FO port, flow control disabled			
- 6 RJ45 ports, 2 SC FO ports			
- 6 RJ45 ports, 2 ST FO ports			
- 6 RJ45 ports, 2 SC FO ports, flow control disabled			

Accessories

Layer-1 security elements	FL PLUG GUARD...

Ethernet

5/8 RJ45 ports

Ex:

Technical data

FL SWITCH SFN 5TX	FL SWITCH SFN 8TX
5 (RJ45 ports)	8 (RJ45 ports)
10/100 Mbps	
-	
-	
-	
-	
-	
Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode	
LEDs: U_S, link and activity per port	LEDs: U_{S1}, link and activity per port
24 V DC	
3.6 V_{PP}	
9 V DC ... 32 V DC	
90 mA (at U_S = 24 V DC)	typ. 140 mA (at U_S = 24 V DC)
30 mm / 120 mm / 70 mm	50 mm / 120 mm / 70 mm
IP20	
0 °C ... 60 °C	
5 % ... 95 % (non-condensing)	
EN 61000-6-4	
EN 61000-6-2:2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 5TX	2891152	1
FL SWITCH SFN 8TX	2891929	1
FL SWITCH SFN 8TX-NF	2891022	1

Accessories

FL PLUG GUARD...

Ethernet

4/7 RJ45 ports and 1 FO port

Ex:

Technical data

FL SWITCH SFN 4TX/FX	FL SWITCH SFN 7TX/FX ST
4 (RJ45 ports)	7 (RJ45 ports)
10/100 Mbps	
1 (SC multi-mode)	1 (ST multi-mode)
100 Mbps (full duplex)	
1300 nm/1310 nm	
2000 m (Fiberglass 50/125)	
2000 m (Fiberglass 62.5/125)	
Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode	
LEDs: U_S, link and activity per port	
24 V DC	
3.6 V_{PP}	
9 V DC ... 32 V DC	
typ. 140 mA (at U_S = 24 V DC)	typ. 190 mA (at U_S = 24 V DC)
30 mm / 120 mm / 70 mm	50 mm / 120 mm / 70 mm
IP20	
0 °C ... 60 °C	
5 % ... 95 % (non-condensing)	
EN 61000-6-4	
EN 61000-6-2:2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 4TX/FX	2891851	1
FL SWITCH SFN 4TX/FX ST	2891453	1
FL SWITCH SFN 7TX/FX	2891097	1
FL SWITCH SFN 7TX/FX ST	2891110	1
FL SWITCH SFN 7TX/FX-NF	2891023	1

Accessories

FL PLUG GUARD...

Ethernet

6 RJ45 ports and 2 FO ports

Ex:

Technical data

FL SWITCH SFN 6TX/2FX	FL SWITCH SFN 6TX/2FX ST
6 (RJ45 ports)	
10/100 Mbps	
2 (SC multi-mode)	2 (ST multi-mode)
100 Mbps (full duplex)	
1300 nm	
2000 m (Fiberglass 50/125)	
2000 m (Fiberglass 62.5/125)	
Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode	
LEDs: U_S, link and activity per port	
24 V DC	
3.6 V_{PP}	
9 V DC ... 32 V DC	
typ. 230 mA (at U_S = 24 V DC)	
50 mm / 120 mm / 70 mm	
IP20	
0 °C ... 60 °C	
5 % ... 95 % (non-condensing)	
EN 61000-6-4	
EN 61000-6-2:2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 6TX/2FX	2891314	1
FL SWITCH SFN 6TX/2FX ST	2891411	1
FL SWITCH SFN 6TX/2FX-NF	2891024	1

Accessories

FL PLUG GUARD...

Standard Switches with up to 16 ports

FL SWITCH SFN(T)... 16-port Unmanaged Switches provide high-density Ethernet connections for large or supervisory applications.

Features:

– 16 ports in a narrow, metal housing with redundant power supply
– Optional SC fiber optic ports
– Standard (-10 °C ... +60 °C) and wide temperature (-40 °C ... +75 °C) devices available
– RJ45 ports provide 10/100 Mbps speeds; fiber optic ports operate at 100 Mbps
– Auto negotiation and autocross recognition provide easy installation and setup
– LED indicators provide local diagnostics
– Cable locking security options
– DC and AC power supply options

Ethernet

5/8 RJ45 ports with AC supply

Ex:

Technical data

		FL SWITCH SFN 5TX-24VAC	FL SWITCH SFN 8TX-24VAC
Ethernet interface			
Number of ports		5 (RJ45 ports)	8 (RJ45 ports)
Transmission speed		10/100 Mbps	
Fiber optic interface			
Number of ports		-	
Transmission speed		-	
Wavelength		-	
Transmission length		-	
Function			
Basic functions		Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode	
Status and diagnostic indicators		LEDs: U_S, link and activity per port	LEDs: U_{S1}, link and activity per port
Power supply			
Supply voltage		24 V AC/DC	
Residual ripple		3.6 V_{PP}	
Supply voltage range		20 V AC ... 28 V AC	
Typical current consumption		typ. 114 mA	189 mA
General data			
Dimensions	W / H / D	30 mm / 120 mm / 70 mm	50 mm / 120 mm / 70 mm
Degree of protection		IP20	
Ambient temperature (operation)		0 °C ... 60 °C	
Permissible humidity (operation)		5 % ... 95 % (non-condensing)	
Noise emission		EN 61000-6-4	
Noise immunity		EN 61000-6-2:2005	
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet switch			
- 5 RJ45 ports	**FL SWITCH SFN 5TX-24VAC**	2891021	1
- 8 RJ45 ports	**FL SWITCH SFN 8TX-24VAC**	2891020	1
Ethernet switch			
- 16 RJ45 ports			
- 15 RJ45 ports, 1 FO port			
- 14 RJ45 ports, 2 FO ports			
Ethernet switch, wide temperature			
- 16 RJ45 ports			
- 15 RJ45 ports, 1 FO port			
- 14 RJ45 ports, 2 FO ports			

Ethernet

16 RJ45 ports

Ex:

Technical data

FL SWITCH SFN 16TX	FL SWITCH SFNT 16TX
16 (RJ45 ports) 10/100 Mbps	
- - - -	
Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode, includes alarm contacts LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port, voltage alarm	
24 V DC (redundant) 3.6 V_{PP} 12 V DC ... 48 V DC 350 mA (at U_S = 24 V DC)	
70 mm / 135 mm / 110 mm IP20 0 °C ... 60 °C -40 °C ... 75 °C 5 % ... 95 % (non-condensing) EN 61000-6-4 EN 61000-6-2 Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 16TX	2891933	1
FL SWITCH SFNT 16TX	2891952	1

Ethernet

15 RJ45 ports and 1 FO port

Ex:

Technical data

FL SWITCH SFN 15TX/FX	FL SWITCH SFNT 15TX/FX
15 (RJ45 ports) 10/100 Mbps	
1 (SC multi-mode) 100 Mbps (full duplex) 1300 nm 12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	
Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode, includes alarm contacts LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port, voltage alarm	
24 V DC (redundant) 3.6 V_{PP} 12 V DC ... 48 V DC 350 mA (at U_S = 24 V DC)	
70 mm / 135 mm / 110 mm IP20 0 °C ... 60 °C -40 °C ... 75 °C 5 % ... 95 % (non-condensing) EN 61000-6-4 EN 61000-6-2 Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 15TX/FX	2891934	1
FL SWITCH SFNT 15TX/FX	2891953	1

Ethernet

14 RJ45 ports and 2 FO ports

Ex:

Technical data

FL SWITCH SFN 14TX/2FX	FL SWITCH SFNT 14TX/2FX
14 (RJ45 ports) 10/100 Mbps	
2 (SC multi-mode) 100 Mbps (full duplex) 1300 nm 12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	
Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode, includes alarm contacts LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port, voltage alarm	
24 V DC (redundant) 3.6 V_{PP} 12 V DC ... 48 V DC 350 mA (at U_S = 24 V DC)	
70 mm / 135 mm / 110 mm IP20 0 °C ... 60 °C -40 °C ... 75 °C 5 % ... 95 % (non-condensing) EN 61000-6-4 EN 61000-6-2 Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 14TX/2FX	2891935	1
FL SWITCH SFNT 14TX/2FX	2891954	1

Standard Gigabit Switch

FL SWITCH SFN... Gigabit Unmanaged Switches have a wide range of fiber and copper port configurations for high performance applications.

Features:

– 5/8 ports in a narrow, metal housing with redundant power supply
– All ports provide 1000 Mbps speeds
– LED indicators provide local diagnostics
– Relay contact
– **FL SWITCH SFN 6GT/2LX** provides up to 10 km transmission length with 2 single-mode fiber ports
– **FL SWITCH SFN 6GT/2LX-20** provides up to 20 km transmission length with 2 single-mode fiber ports

Ethernet

5/8 RJ45 ports

Ex:

Technical data

		FL SWITCH SFN 5GT	FL SWITCH SFN 8GT
Ethernet interface			
Number of ports		5 (RJ45 ports)	8 (RJ45 ports)
Transmission speed		10/100/1000 Mbps	
Fiber optic interface			
Number of ports		-	
Transmission speed		-	
Wavelength		-	
Transmission length		-	
Other connections			
-		-	Plug-in/screw connection via COMBICON
Function			
Basic functions		Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode	
Status and diagnostic indicators		LEDs: U_S, link and activity per port	LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port
Power supply			
Supply voltage		24 V DC	24 V DC (redundant)
Residual ripple		3.6 V_{PP}	
Supply voltage range		10 V DC ... 60 V DC	9 V DC ... 32 V DC
Typical current consumption		typ. 200 mA (at U_S = 24 V DC)	typ. 430 mA (at U_S = 24 V DC)
General data			
Dimensions	W / H / D	28 mm / 110 mm / 70 mm	50 mm / 120 mm / 70 mm
Degree of protection		IP20	
Ambient temperature (operation)		-10 °C ... 60 °C	-25 °C ... 75 °C
Permissible humidity (operation)		5 % ... 95 % (non-condensing)	
Noise emission		EN 61000-6-4	
Noise immunity		EN 61000-6-2:2005	
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet switch			
- 5 RJ45 ports	**FL SWITCH SFN 5GT**	2891444	1
- 8 RJ45 ports	**FL SWITCH SFN 8GT**	2891673	1
- 7 RJ45 ports, 1 SC FO port (multi-mode)			
- 6 RJ45 ports, 2 SC FO ports (multi-mode)			
- 6 RJ45 ports, 2 SC FO ports (single-mode) with 10 km range			
- 6 RJ45 ports, 2 SC FO ports (single-mode) with 20 km range			
Ethernet switch, wide temperature			
- 5 RJ45 ports			
Ethernet switch, wide temperature, conformal coating for harsh environments			
- 5 RJ45 ports			

Accessories

Layer-1 security elements	

Ethernet

7 / 6 RJ45 ports and
1 / 2 fiber optic ports (multi-mode)

Ex:

Technical data

FL SWITCH SFN 7GT/SX	FL SWITCH SFN 6GT/2SX
7 (RJ45 ports)	6 (RJ45 ports)
10/100/1000 Mbps	
1 (SC multi-mode)	2 (SC multi-mode)
1000 Mbps (full duplex)	
850 nm	
220 m (Fiberglass 62.5/125)	
Plug-in/screw connection via COMBICON	
Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
24 V DC (redundant)	
3.6 V_{PP}	
9 V DC ... 32 V DC	
typ. 320 mA (at U_S = 24 V DC)	typ. 350 mA (at U_S = 24 V DC)
50 mm / 120 mm / 70 mm	
IP20	
-25 °C ... 75 °C	
5 % ... 95 % (non-condensing)	
EN 61000-6-4	
EN 61000-6-2:2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 7GT/SX	2891518	1
FL SWITCH SFN 6GT/2SX	2891398	1

Accessories

FL PLUG GUARD...

Ethernet

6 RJ45 ports and
2 fiber optic ports (single-mode)

Ex:

Technical data

FL SWITCH SFN 6GT/2LX	FL SWITCH SFN 6GT/2LX-20
6 (RJ45 ports)	
10/100/1000 Mbps	
2 (SC single-mode)	
1000 Mbps (full duplex)	
1310 nm	
10000 m (Fiberglass 9/125)	20000 m (Fiberglass 9/125)
Plug-in/screw connection via COMBICON	
Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
24 V DC (redundant)	
3.6 V_{PP}	
9 V DC ... 32 V DC	
typ. 360 mA (at U_S = 24 V DC)	
50 mm / 120 mm / 70 mm	
IP20	
-25 °C ... 75 °C	0 °C ... 60 °C
5 % ... 95 % (non-condensing)	
EN 61000-6-4	
EN 61000-6-2:2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 6GT/2LX	2891987	1
FL SWITCH SFN 6GT/2LX-20	2891563	1

Accessories

FL PLUG GUARD...

Ethernet

5 RJ45 ports, extended temperature range
(-40 °C ... +75 °C)

Ex:

Technical data

FL SWITCH SFNT 5GT	FL SWITCH SFNT 5GT-C
5 (RJ45 ports)	
10/100/1000 Mbps	
-	
-	
-	
-	
-	
Unmanaged Switch / autonegotiation, complies with IEEE 802.3, Store and Forward Swiching mode, includes QoS and alarm contact	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port, alarm (power and link down)	
24 V DC (redundant)	
3.6 V_{PP}	
10 V DC ... 60 V DC	
typ. 223 mA (at U_S = 24 V DC)	
30 mm / 130 mm / 100 mm	
IP20	
-40 °C ... 75 °C	
5 % ... 95 % (non-condensing)	
EN 61000-6-4	
-	EN 61000-6-2:2005
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFNT 5GT	2891390	1
FL SWITCH SFNT 5GT-C	2891391	1

Accessories

FL PLUG GUARD...

Standard Switch with wide temperature range

FL SWITCH SFNT... Unmanaged Switches are optimized for use in extreme environments and marine applications.

Features:

- 5 to 8 ports in a narrow, metal housing with redundant power supply
- Optional SC and ST fiber optic ports
- RJ45 ports provide 10/100 Mbps speeds; fiber optic ports operate at 100 Mbps
- Extended temperature range for harsh environments (-40°C ... +75°C)
- Auto negotiation and autocross recognition provide easy installation and setup
- Quality of Service (QoS) prioritized messages
- LED indicators provide local diagnostics
- Alarm contact provides power and link status diagnostics
- Switch-mounted cable locking and port blocking options

Ethernet

5/8 RJ45 ports

Ex:

Technical data

		FL SWITCH SFNT 5TX	FL SWITCH SFNT 8TX
Ethernet interface			
Number of ports		5 (RJ45 ports)	8 (RJ45 ports)
Transmission speed		10/100 Mbps	
Connection method		RJ45	
Fiber optic interface			
Number of ports		-	
Transmission speed		-	
Wavelength		-	
Transmission length		-	
Function			
Basic functions		Unmanaged Switch / autonegotiation, complies with IEEE 802.3, Store and Forward Swiching mode, includes QoS and alarm contact	
Status and diagnostic indicators		LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port, alarm (power and link down)	
Power supply			
Supply voltage		24 V DC (redundant)	
Residual ripple		3.6 V_{PP}	
Supply voltage range		9 V DC ... 32 V DC	
Typical current consumption		125 mA (at U_S = 24 V DC)	155 mA (at U_S = 24 V DC)
General data			
Dimensions	W / H / D	30 mm / 130 mm / 100 mm	50 mm / 130 mm / 100 mm
Degree of protection		IP20	
Ambient temperature (operation)		-40 °C ... 75 °C	
Permissible humidity (operation)		5 % ... 95 % (non-condensing)	
Noise emission		EN 61000-6-4	
Noise immunity		EN 61000-6-2	
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet switch, wide temperature			
- 5 RJ45 ports	**FL SWITCH SFNT 5TX**	2891003	1
- 8 RJ45 ports	**FL SWITCH SFNT 8TX**	2891005	1
- 4 RJ45 ports, 1 SC FO port			
- 7 RJ45 ports, 1 SC FO port			
- 7 RJ45 ports, 1 ST FO port			
- 6 RJ45 ports, 2 SC FO ports			
- 6 RJ45 ports, 2 ST FO ports			
Ethernet switch, wide temperature, conformal coating for harsh environments			
- 5 RJ45 ports	**FL SWITCH SFNT 5TX-C**	2891043	1
- 8 RJ45 ports	**FL SWITCH SFNT 8TX-C**	2891045	1
- 4 RJ45 ports, 1 SC FO port			
- 7 RJ45 ports, 1 SC FO port			
- 7 RJ45 ports, 1 ST FO port			
- 6 RJ45 ports, 2 SC FO ports			
- 6 RJ45 ports, 2 ST FO ports			

Accessories

Mounting plate, for 5- and 8-port SFNT switches	**FL PA SFNT 5-8**	2891012	1

Ethernet

4 RJ45 ports and 1 FO port

Ex:

Technical data

4 (RJ45 ports) 10/100 Mbps RJ45	
1 (SC multi-mode) 100 Mbps (full duplex) 1300 nm 12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	
Unmanaged Switch / autonegotiation, complies with IEEE 802.3, Store and Forward Swiching mode, includes QoS and alarm contact LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port, alarm (power and link down)	
24 V DC (redundant) 3.6 V_{PP} 9 V DC ... 32 V DC 180 mA (at U_S = 24 V DC)	
30 mm / 130 mm / 100 mm IP20 -40 °C ... 75 °C 5 % ... 95 % (non-condensing) EN 61000-6-4 EN 61000-6-2 Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFNT 4TX/FX	2891004	1
FL SWITCH SFNT 4TX/FX-C	2891044	1

Accessories

FL PA SFNT 5-8	2891012	1

Ethernet

7 RJ45 ports and 1 FO port

Ex:

Technical data

FL SWITCH SFNT 7TX/FX	FL SWITCH SFNT 7TX/FX ST
7 (RJ45 ports) 10/100 Mbps RJ45	
1 (SC multi-mode) 100 Mbps (full duplex) 1300 nm 12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	1 (ST multi-mode)
Unmanaged Switch / autonegotiation, complies with IEEE 802.3, Store and Forward Swiching mode, includes QoS and alarm contact LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port, alarm (power and link down)	
24 V DC (redundant) 3.6 V_{PP} 9 V DC ... 32 V DC 180 mA (at U_S = 24 V DC)	
50 mm / 130 mm / 100 mm IP20 -40 °C ... 75 °C 5 % ... 95 % (non-condensing) EN 61000-6-4 EN 61000-6-2 Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFNT 7TX/FX	2891006	1
FL SWITCH SFNT 7TX/FX ST	2891007	1
FL SWITCH SFNT 7TX/FX-C	2891046	1
FL SWITCH SFNT 7TX/FX ST-C	2891047	1

Accessories

FL PA SFNT 5-8	2891012	1

Ethernet

6 RJ45 ports and 2 FO ports

Ex:

Technical data

FL SWITCH SFNT 6TX/2FX	FL SWITCH SFNT 6TX/2FX ST
6 (RJ45 ports) 10/100 Mbps RJ45	
2 (SC multi-mode) 100 Mbps (full duplex) 1300 nm	2 (ST multi-mode) - 12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)
Unmanaged Switch / autonegotiation, complies with IEEE 802.3, Store and Forward Swiching mode, includes QoS and alarm contact LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port, alarm (power and link down)	
24 V DC (redundant) 3.6 V_{PP} 9 V DC ... 32 V DC 250 mA (at U_S = 24 V DC)	
50 mm / 130 mm / 100 mm IP20 -40 °C ... 75 °C 5 % ... 95 % (non-condensing) EN 61000-6-4 EN 61000-6-2 Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFNT 6TX/2FX	2891025	1
FL SWITCH SFNT 6TX/2FX ST	2891026	1
FL SWITCH SFNT 6TX/2FX-C	2891048	1
FL SWITCH SFNT 6TX/2FX ST-C	2891049	1

Accessories

FL PA SFNT 5-8	2891012	1

Standard SF Switch

FL SWITCH SF... Unmanaged Switches have a wide variety of port configurations in a low-profile, metal housing for general-purpose applications.

Features:

– Up to 16 ports in a low-profile, metal housing with redundant power supply
– Optional SC and ST fiber optic ports
– RJ45 ports provide 10/100 Mbps speeds; fiber optic ports operate at 100 Mbps
– Auto negotiation and autocross recognition provide easy installation and setup
– LED indicators provide local diagnostics
– Relay contact provides power status alarming
– Cable locking security options

Ethernet

8/16 RJ45 ports

Ex:

Technical data

		FL SWITCH SF 8TX	FL SWITCH SF 16TX
Ethernet interface			
Number of ports		8 (RJ45 ports)	16 (RJ45 ports)
Transmission speed		10/100 Mbps	
Fiber optic interface			
Number of ports		-	
Transmission speed		-	
Wavelength		-	
Transmission length		-	
Other connections			
Potential-free signaling contact		Plug-in/screw connection via COMBICON	
Function			
Basic functions		Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode	
Status and diagnostic indicators		LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
Power supply			
Supply voltage		24 V DC (redundant)	
Residual ripple		3.6 V_{PP}	
Supply voltage range		18.5 V DC ... 30.2 V DC	
Typical current consumption		typ. 200 mA (at U_S = 24 V DC)	typ. 300 mA (at U_S = 24 V DC)
General data			
Dimensions	W / H / D	135 mm / 94.3 mm / 30 mm	205 mm / 94.3 mm / 30 mm
Degree of protection		IP20	
Ambient temperature (operation)		0 °C ... 55 °C	
Permissible humidity (operation)		5 % ... 95 % (non-condensing)	
Noise emission		EN 61000-6-4	
Noise immunity		EN 61000-6-2:2005	
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet switch			
- 8 RJ45 ports	**FL SWITCH SF 8TX**	2832771	1
- 16 RJ45 ports	**FL SWITCH SF 16TX**	2832849	1
- 7 RJ45 ports, 1 SC FO port			
- 7 RJ45 ports, 1 ST FO port			
- 15 RJ45 ports, 1 SC FO port			
- 6 RJ45 ports, 2 SC FO ports			
- 6 RJ45 ports, 2 ST FO ports			
- 14 RJ45 ports, 2 SC FO ports			
- 4 RJ45 ports, 3 ST FO ports			

Ethernet

7/15 RJ45 ports and 1 FO port

Ex:

Technical data

FL SWITCH SF 7TX/FX	FL SWITCH SF 15TX/FX
7 (RJ45 ports)	15 (RJ45 ports)
10/100 Mbps	
1 (SC multi-mode)	
100 Mbps (full duplex)	
1300 nm	
5.7 km (fiberglass with F-G 50/125 0.7 dB/km F1200)	6400 m (fiberglass with F-G 50/125 0.7 dB/km F1200)
Plug-in/screw connection via COMBICON	
Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
24 V DC (redundant)	
3.6 V_{PP}	
18.5 V DC ... 30.2 V DC	
typ. 220 mA (at U_S = 24 V DC)	typ. 330 mA (at U_S = 24 V DC)
135 mm / 115.3 mm / 30 mm	205 mm / 115.3 mm / 30 mm
IP20	
0 °C ... 55 °C	
5 % ... 95 % (non-condensing)	
EN 61000-6-4	
EN 61000-6-2:2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SF 7TX/FX	2832726	1
FL SWITCH SF 7TX/FX ST	2832577	1
FL SWITCH SF 15TX/FX	2832661	1

Ethernet

6/14 RJ45 ports and 2 FO ports

Ex:

Technical data

FL SWITCH SF 6TX/2FX	FL SWITCH SF 14TX/2FX
6 (RJ45 ports)	14 (RJ45 ports)
10/100 Mbps	
2 (SC multi-mode)	
100 Mbps (full duplex)	
1300 nm	
5.7 km (fiberglass with F-G 50/125 0.7 dB/km F1200)	6400 m (fiberglass with F-G 50/125 0.7 dB/km F1200)
Plug-in/screw connection via COMBICON	
Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
24 V DC (redundant)	
3.6 V_{PP}	
18.5 V DC ... 30.2 V DC	
240 mA (at U_S = 24 V DC)	typ. 360 mA (at U_S = 24 V DC)
135 mm / 115.3 mm / 30 mm	205 mm / 115.3 mm / 30 mm
IP20	
0 °C ... 55 °C	
5 % ... 95 % (non-condensing)	
EN 61000-6-4	
EN 61000-6-2:2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SF 6TX/2FX	2832933	1
FL SWITCH SF 6TX/2FX ST	2832674	1
FL SWITCH SF 14TX/2FX	2832593	1

Ethernet

4 RJ45 ports and 3 FO ports

Ex:

Technical data

4 (RJ45 ports)
10/100 Mbps
3 (ST multi-mode)
100 Mbps (full duplex)
1300 nm
6400 m (fiberglass with F-G 50/125 0.7 dB/km F1200)
Plug-in/screw connection via COMBICON
Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port
24 V DC (redundant)
3.6 V_{PP}
18.5 V DC ... 30.2 V DC
typ. 240 mA (at U_S = 24 V DC)
135 mm / 115.3 mm / 30 mm
IP20
0 °C ... 55 °C
5 % ... 95 % (non-condensing)
EN 61000-6-4
EN 61000-6-2:2005
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SF 4TX/3FX ST	2832603	1

Unmanaged Switches, 19" rack-mount

FL SWITCH 1824 and 1924 rack mount switches provide 24 twisted pair ports (RJ45) of 10/100 or 10/100/1000 mbps and are optimized for large scale or 19" rack mount preferred applications.

Features:

– Fully industrial switches with high IEC 61000-4 noise immunity and 0-60c operation
– Wide input AC voltage range for flexible use - AC powered 100-240 V AC

Ethernet

24 RJ45 ports
10/100 Mbps

Ethernet

24 RJ45 ports
10/100/1000 Mbps

		Technical data	Technical data
Ethernet interface			
Number of ports		24 (RJ45 ports)	24 (RJ45 ports)
Transmission speed		10/100 Mbps	10/100/1000 Mbps (full or half duplex)
Connection method		RJ45	RJ45
Function			
Basic functions		Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode	Unmanaged Switch / auto negotiation, complies with IEEE 802.3, Store and Forward Swiching mode
Status and diagnostic indicators		LEDs: U_S, link and activity per port	LEDs: U_S, link and activity per port
Power supply			
Supply voltage		120 V AC 220 V AC	120 V AC 220 V AC
Supply voltage range		100 V AC ... 240 V AC (50/60 Hz)	100 V AC ... 240 V AC (50/60 Hz)
Typical current consumption		270 mA (100 V AC)	312 mA (100 V AC)
General data			
Dimensions	W / H / D	440 mm / 44 mm / 173 mm	482 mm / 44 mm / 210 mm
Degree of protection		IP20	IP20
Ambient temperature (operation)		0 °C ... 60 °C	0 °C ... 60 °C
Permissible humidity (operation)		5 % ... 95 % (non-condensing)	5 % ... 95 % (non-condensing)
Noise emission		EN 61000-6-4	EN 61000-6-4
Noise immunity		EN 61000-6-2:2005	EN 61000-6-2:2005
EMC note		Class A product, see page 525	Class A product, see page 525

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Ethernet switch						
	FL SWITCH 1824	**2891041**	1	**FL SWITCH 1924**	**2891057**	1

Hubs and IP67 switches

The **FL HUB 8/16TX ZF** is particularly flexible for use in applications where hubs are required. It is ideal for special automation protocols, such as Powerlink or FL Net.

The **FL SWITCH 1605** was developed for use in harsh environments. Thanks to its degree of protection and compact design, it is ideal for use directly in the machine.

Ethernet

Hub with RJ45 ports

Ethernet

Standard Switch, IP67 degree of protection, suitable for PROFINET

Ex:

Technical data

		FL HUB 8TX-ZF	FL HUB 16TX-ZF
Ethernet interface			
Number of ports		8 (RJ45 ports)	16 (RJ45 ports)
Transmission speed		10/100 Mbps	
Function			
Basic functions		Hub/repeater, compliance with IEEE 802.3	
Status and diagnostic indicators		LEDs: UL (communications voltage), COL (collision) link and receive LED per port	
Power supply			
Supply voltage		24 V DC	
Residual ripple		3.6 V_{PP}	
Supply voltage range		18.5 V DC ... 30.5 V DC	
Typical current consumption		typ. 144 mA (at U_S = 24 V DC)	
General data			
Dimensions	W / H / D	45 mm / 99 mm / 112 mm	90 mm / 99 mm / 112 mm
Degree of protection		IP20	
Ambient temperature (operation)		0 °C ... 60 °C	0 °C ... 55 °C
Permissible humidity (operation)		30 % ... 95 % (non-condensing)	
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet hub			
- 8 RJ45 ports	**FL HUB 8TX-ZF**	2832551	1
- 16 RJ45 ports	**FL HUB 16TX-ZF**	2832564	1
Ethernet switch			
- 5 Ethernet ports in M12 format			

Technical data

Ethernet interface		
Number of ports		5 (M12 socket)
Transmission speed		10/100 Mbps
Function		
Basic functions		Unmanaged Switch/auto negotiation, complies with standard IEEE 802.3, Store and Forward Swiching mode, 2 priority classes according to IEEE802.1p, PTCP filter
Status and diagnostic indicators		LEDs: US (power supply), 2 LEDs per Ethernet port (Link and Activity)
Power supply		
Supply voltage		24 V DC (M12 connector)
Residual ripple		3.6 V_{PP}
Supply voltage range		18 V DC ... 32 V DC
Typical current consumption		40 mA (at U_S = 24 V DC)
General data		
Dimensions	W / H / D	30 mm / 200 mm / 41 mm
Degree of protection		IP65/IP66/IP67
Ambient temperature (operation)		-40 °C ... 70 °C
Permissible humidity (operation)		10 % ... 95 %
EMC note		

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 1605 M12	2700200	1

Power over Ethernet Switches

new

Power over Ethernet splitter

Power over Ethernet enables the common transmission of power and data.

Thanks to the use of the Power over Ethernet standard IEEE 802.3af, the following terminal devices can be operated, for example:
– WLAN access points
– IP phones
– IP cameras

The **FL PD 1001T GT** power splitter allows you to separate the data and voltage for supplying standard devices via PoE.

Features:
– Protocol transparent
– Output power up to 21.5 W
– 10/100/1000 Mbps

The **FL SWITCH 1001T-4POE** 5-Port Unmanaged Switch provides four Power over Ethernet connections with 10/100 Mbps.

Features:
– Flexible use of PoE devices thanks to powerful 30 W PoE ports (IEEE 802.3at)
– Extended temperature range for harsh environments (-40°C ... +75°C)
– Redundant supply with alarm contact for maximum network availability

The **FL SWITCH 1708 M12 POE** Gigabit Switch offers a unique combination of a high degree of protection, Gigabit transmission, and Power over Ethernet.

Features:
– Connection via gigabit M12 connector CAT6A
– Flexible use of PoE devices thanks to powerful 30 W PoE ports (IEEE 802.3at)
– Extended temperature range (-40 °C ... +70 °C)
– Gigabit support
– Jumbo frames with up to 9720 bytes
– Robust metal housing
– IP67 degree of protection
– Easy panel mounting

Technical data

Ethernet interface		
Number of ports		1 (Ethernet port)
Transmission speed		10/100/1000 Mbps
Connection method		8-pos. RJ45 socket
Function		
Basic functions		PD, conforms to IEEE 802.3af/at
Status and diagnostic indicators		LEDs: POE, 24 V DC
Power supply		
Supply voltage		48 V DC (via PoE)
Residual ripple		-
Supply voltage range		44 V DC ... 57 V DC
Typical current consumption		-
General data		
Dimensions	W / H / D	40 mm / 100 mm / 109 mm
Degree of protection		IP20
Ambient temperature (operation)		-40 °C ... 70 °C
Permissible humidity (operation)		10 % ... 95 % (non-condensing)
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Power over Ethernet splitter	**FL PD 1001 T GT**	2891042	1
Power-over-Ethernet module (PSE)			
Power-over-Ethernet switch			
Gigabit Power-over-Ethernet switch			

Ethernet

Power over Ethernet injector

Ex:

Technical data

2 (PoE ports) 10/100 Mbps 8-pos. RJ45 socket	
PSE/midspan, complies with IEEE 802.3af	
LEDs: US, PoE detection per port	
24 V DC (via COMBICON; max. conductor cross section 2.5 mm²)	
3.6 V_{PP} 18.5 V DC ... 30.5 V DC typ. 100 mA (During no load; approx. 1800 mA at 24 V at the input with maximum load and 25°C ambient temperature)	
45 mm / 99 mm / 112 mm IP20 0 °C ... 55 °C 30 % ... 95 % (non-condensing) Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL PSE 2TX	**2891013**	1

Ethernet

Power-over-Ethernet switch

Technical data

5 (4x POE ports, 1x 10/100 port) 10/100 Mbps RJ45 socket	
PSE, complies with IEEE 802.3at	
LEDs: U_{S1}, U_{S2} (redundant voltage supply); alarm; LNK/ACT, POE, 100 Mbps per port	
24 V DC	
3.6 V_{PP} 18 V DC ... 57 V DC 6.2 A (at U_S =24 V DC)	
55 mm / 117 mm / 78 mm IP20 -40 °C ... 75 °C 5 % ... 95 % (non-condensing) Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 1001T-4POE	**2891064**	1

Ethernet

8 ports (M12 socket), for wall mounting, IP67 protection

Technical data

- - -	
Store and Forward Swich, 10/100/1000 Mbps, auto negotiation, complies with standard IEEE 802.3, 4 priority classes according to IEEE 802.1p, PoE according to IEEE 802.3at/802.3af, jumbo frames up to 9720 bytes	
LEDs: US1, US2 (power supply), Fail (alarm contact), 3 LEDs per Ethernet port (Link, Activity, and PoE Status), and PoE performance	
24 V DC (M12 connector)	
3.6 V_{PP} 18.7 V DC ... 30.5 V DC 300 mA (at U_S = 24 V DC)	
176 mm / 112 mm / 100 mm IP65/IP66/IP67 -40 °C ... 70 °C (non-condensing) 10 % ... 95 %	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 1708 M12 POE	**2701883**	1

2000 series Managed Switches for the series production of machines

2000 and 2100 Managed Switches provide an optimum range of functions for use in applications that require easy network configuration and diagnostics.

Features:

– Loop Protection via Rapid Spanning Tree Protocol (RSTP)
– Port-based DHCP server
– Configuration memory (SD card)
– IGMP snooping/querier
– Supports PROFINET and EtherNet/IP™

new

Ethernet

5/8 RJ45 ports
10/100 Mbps

new

Ethernet

5/8 RJ45 ports
10/100/1000 Mbps

Technical data

	FL SWITCH 2005	FL SWITCH 2008
Ethernet interface		
Number of ports	5 (RJ45 ports)	8 (RJ45 ports)
Transmission speed	10/100 Mbps	
Function		
Basic functions	Store and Forward Swich, complies with IEEE 802.3	
Management	Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Command-line interface (Telnet, SSH)	
Diagnostics function	RMON History LLDP (Link Layer Discovery Protocol) SNMP-Traps N:1-Portmirroring ACD (Address Conflict Detection)	
Redundancy	MRP (Media Redundancy Protocol) RSTP (Rapid Spanning Tree Protocol)	
Status and diagnostic indicators	LEDs: US (power supply), 2 LEDs per Ethernet port (Link/Activity and Speed)	
Power supply		
Supply voltage	24 V DC (single)	
Residual ripple	3.6 V_{PP}	
Supply voltage range	18.5 V DC ... 30.5 V DC	
Typical current consumption	165 mA (at U_S = 24 V DC)	180 mA (at U_S = 24 V DC)
General data		
Dimensions W / H / D	45 mm / 130 mm / 115 mm	
Degree of protection	IP20	
Ambient temperature (operation)	0 °C ... 60 °C	
Permissible humidity (operation)	10 % ... 95 % (non-condensing)	
Noise emission	EN 61000-6-4	
Noise immunity	EN 61000-6-2	
EMC note	Class A product, see page 525	

Technical data

	FL SWITCH 2105	FL SWITCH 2108
Ethernet interface		
Number of ports	5 (RJ45 ports)	8 (RJ45 ports)
Transmission speed	10/100/1000 Mbps	
Function		
Basic functions	Store and Forward Swich, complies with IEEE 802.3	
Management	Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Command-line interface (Telnet, SSH)	
Diagnostics function	RMON History LLDP (Link Layer Discovery Protocol) SNMP-Traps N:1-Portmirroring ACD (Address Conflict Detection)	
Redundancy	MRP (Media Redundancy Protocol) RSTP (Rapid Spanning Tree Protocol)	
Status and diagnostic indicators	LEDs: US (power supply), 2 LEDs per Ethernet port (Link/Activity and Speed)	
Power supply		
Supply voltage	24 V DC (single)	
Residual ripple	3.6 V_{PP}	
Supply voltage range	18.5 V DC ... 30.5 V DC	
Typical current consumption	225 mA (at U_S = 24 V DC)	275 mA (at U_S = 24 V DC)
General data		
Dimensions W / H / D	45 mm / 130 mm / 115 mm	
Degree of protection	IP20	
Ambient temperature (operation)	0 °C ... 60 °C	
Permissible humidity (operation)	10 % ... 95 % (non-condensing)	
Noise emission	EN 61000-6-4	
Noise immunity	EN 61000-6-2	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet switch			
- 5 RJ45 ports	**FL SWITCH 2005**	2702323	1
- 8 RJ45 ports	**FL SWITCH 2008**	2702324	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2105	2702665	1
FL SWITCH 2108	2702666	1

2000 series Managed Switches for universal automation applications

The 2200 and 2300 Managed Switches with enhanced functions offer an optimum range of functions, choice of versions, and approvals for a wide range of applications, e.g., in the maritime sector or process technology.

Features:

– Media Redundancy Protocol (MRP) according to IEC 62439
– Extended temperature range (-40 °C ... +70 °C)
– Redundant power supply
– IGMP snooping/querier

new

Ethernet

5/8 RJ45 ports
10/100 Mbps

new

Ethernet

8 RJ45 ports
10/100/1000 Mbps

Technical data

		FL SWITCH 2205	FL SWITCH 2208
Ethernet interface			
Number of ports		5 (RJ45 ports)	8 (RJ45 ports)
Transmission speed		10/100 Mbps	
Function			
Basic functions		Store and Forward Swich, complies with IEEE 802.3	
Management		Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Command-line interface (Telnet, SSH)	
Diagnostics function		RMON History LLDP (Link Layer Discovery Protocol) SNMP-Traps N:1-Portmirroring ACD (Address Conflict Detection)	
Redundancy		MRP (Media Redundancy Protocol) RSTP (Rapid Spanning Tree Protocol) FRD (Fast Ring Detection) Large Tree Support	
Status and diagnostic indicators		LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link/Activity and Speed)	
Power supply			
Supply voltage		24 V DC (redundant)	
Residual ripple		3.6 V_{PP}	
Supply voltage range		12 V DC ... 57 V DC	
Typical current consumption		170 mA (at U_S = 24 V DC)	185 mA (at U_S = 24 V DC)
General data			
Dimensions	W / H / D	45 mm / 130 mm / 115 mm	
Degree of protection		IP20	
Ambient temperature (operation)		-40 °C ... 70 °C	
Permissible humidity (operation)		10 % ... 95 % (non-condensing)	
Noise emission		EN 61000-6-4	
Noise immunity		EN 61000-6-2	

Technical data

8 (RJ45 ports)	
10/100/1000 Mbps	
Store and Forward Swich, complies with IEEE 802.3	
Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Command-line interface (Telnet, SSH)	
RMON History LLDP (Link Layer Discovery Protocol) SNMP-Traps N:1-Portmirroring ACD (Address Conflict Detection)	
MRP (Media Redundancy Protocol) RSTP (Rapid Spanning Tree Protocol) FRD (Fast Ring Detection) Large Tree Support	
LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link/Activity and Speed)	
24 V DC (redundant)	
3.6 V_{PP}	
12 V DC ... 57 V DC	
280 mA (at U_S = 24 V DC)	
45 mm / 130 mm / 115 mm	
IP20	
-40 °C ... 70 °C	
10 % ... 95 % (non-condensing)	
EN 61000-6-4	
EN 61000-6-2	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet switch			
- 5 RJ45 ports	**FL SWITCH 2205**	2702326	1
- 8 RJ45 ports	**FL SWITCH 2208**	2702327	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2308	2702652	1

2000 series Managed Switches with glass fiber interfaces

2200 Managed Switches offer a wide range of possibilities for constructing networks with glass fiber connections. The range comprises multimode or single-mode versions with SC or ST connections and satisfies various approvals for maritime applications and process technology.

Features:

– Media Redundancy Protocol (MRP) according to IEC 62439
– Extended temperature range (-40 °C ... +70 °C)
– Redundant power supply
– IGMP snooping/querier
– HTTPS/SNMPv3
– Port-based/pool-based DHCP server, DHCP option 82

new

Ethernet

7 RJ45 ports and 1 fiber optic port (multi-mode)

Technical data

Ethernet interface		
Number of ports		7 (RJ45 ports)
Transmission speed		10/100 Mbps
Fiber optic interface		
Number of ports		1 (SC multi-mode)
Transmission speed		100 Mbps (full duplex)
Wavelength		1300 nm
Transmission length		11000 m (fiberglass with F-G 62.5/125 0.7 dB/km F1000)
Function		
Basic functions		Store and Forward Swich, complies with IEEE 802.3
Management		Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Command-line interface (Telnet, SSH)
Diagnostics function		RMON History LLDP (Link Layer Discovery Protocol) SNMP-Traps N:1-Portmirroring ACD (Address Conflict Detection)
Redundancy		MRP (Media Redundancy Protocol) RSTP (Rapid Spanning Tree Protocol) FRD (Fast Ring Detection) Large Tree Support
Status and diagnostic indicators		LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link/Activity and Speed)
Power supply		
Supply voltage		24 V DC (redundant)
Residual ripple		3.6 V_{PP}
Supply voltage range		12 V DC ... 57 V DC
Typical current consumption		220 mA (at U_S = 24 V DC)
General data		
Dimensions	W / H / D	45 mm / 130 mm / 115 mm
Degree of protection		IP20
Ambient temperature (operation)		-40 °C ... 70 °C
Permissible humidity (operation)		10 % ... 95 % (non-condensing)
Noise emission		EN 61000-6-4
Noise immunity		EN 61000-6-2

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet switch - 7 RJ45 ports, 1 SC FO port - 6 RJ45 ports, 2 SC FO ports - 6 RJ45 ports, 2 ST FO ports	**FL SWITCH 2207-FX**	2702328	1

Accessories

Parameterization memory, flash card without license	**SD FLASH 2GB**	2988162	1

new

Ethernet

7 RJ45 ports and
1 fiber optic port (single-mode)

Technical data

7 (RJ45 ports)	
10/100 Mbps	
1 (SC single-mode)	
100 Mbps (full duplex)	
1300 nm	
36000 km (fiberglass with F-G 9/125 0.36 dB/km)	
Store and Forward Swich, complies with IEEE 802.3	
Web-based management (HTTP/HTTPS)	
SNMPv1/v2/v3	
Command-line interface (Telnet, SSH)	
RMON History	
LLDP (Link Layer Discovery Protocol)	
SNMP-Traps	
N:1-Portmirroring	
ACD (Address Conflict Detection)	
MRP (Media Redundancy Protocol)	
RSTP (Rapid Spanning Tree Protocol)	
FRD (Fast Ring Detection)	
Large Tree Support	
LEDs: US1, US2 (power supply), Fail (alarm contact),	
2 LEDs per Ethernet port (Link/Activity and Speed)	
24 V DC (redundant)	
3.6 V_{PP}	
12 V DC ... 57 V DC	
210 mA (at U_S = 24 V DC)	
45 mm / 130 mm / 115 mm	
IP20	
-40 °C ... 70 °C	
10 % ... 95 % (non-condensing)	
EN 61000-6-4	
EN 61000-6-2	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2207-FX SM	2702329	1

Accessories

SD FLASH 2GB	2988162	1

new

Ethernet

6 RJ45 ports and
2 fiber optic ports (multi-mode)

Technical data

FL SWITCH 2206-2FX	FL SWITCH 2206-2FX ST
6 (RJ45 ports)	
10/100 Mbps	
2 (SC multi-mode)	2 (ST multi-mode)
100 Mbps (full duplex)	
1300 nm	
11000 m (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	
Store and Forward Swich, complies with IEEE 802.3	
Web-based management (HTTP/HTTPS)	
SNMPv1/v2/v3	
Command-line interface (Telnet, SSH)	
RMON History	
LLDP (Link Layer Discovery Protocol)	
SNMP-Traps	
N:1-Portmirroring	
ACD (Address Conflict Detection)	
MRP (Media Redundancy Protocol)	
RSTP (Rapid Spanning Tree Protocol)	
FRD (Fast Ring Detection)	
Large Tree Support	
LEDs: US1, US2 (power supply), Fail (alarm contact),	
2 LEDs per Ethernet port (Link/Activity and Speed)	
24 V DC (redundant)	
3.6 V_{PP}	
12 V DC ... 57 V DC	
255 mA (at U_S = 24 V DC)	
45 mm / 130 mm / 115 mm	
IP20	
-40 °C ... 70 °C	
10 % ... 95 % (non-condensing)	
EN 61000-6-4	
EN 61000-6-2	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2206-2FX	2702330	1
FL SWITCH 2206-2FX ST	2702332	1

Accessories

SD FLASH 2GB	2988162	1

new

Ethernet

6 RJ45 ports and
2 fiber optic ports (single-mode)

Technical data

FL SWITCH 2206-2FX SM	FL SWITCH 2206-2FX SM ST
6 (RJ45 ports)	
10/100 Mbps	
2 (SC multi-mode)	2 (ST single-mode)
100 Mbps (full duplex)	
1300 nm	
36000 km (fiberglass with F-G 9/125 0.36 dB/km)	
Store and Forward Swich, complies with IEEE 802.3	
Web-based management (HTTP/HTTPS)	
SNMPv1/v2/v3	
Command-line interface (Telnet, SSH)	
RMON History	
LLDP (Link Layer Discovery Protocol)	
SNMP-Traps	
N:1-Portmirroring	
ACD (Address Conflict Detection)	
MRP (Media Redundancy Protocol)	
RSTP (Rapid Spanning Tree Protocol)	
FRD (Fast Ring Detection)	
Large Tree Support	
LEDs: US1, US2 (power supply), Fail (alarm contact),	
2 LEDs per Ethernet port (Link/Activity and Speed)	
24 V DC (redundant)	
3.6 V_{PP}	
12 V DC ... 57 V DC	
235 mA (at U_S = 24 V DC)	
45 mm / 130 mm / 115 mm	
IP20	
-40 °C ... 70 °C	
10 % ... 95 % (non-condensing)	
EN 61000-6-4	
EN 61000-6-2	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2206-2FX SM	2702331	1
FL SWITCH 2206-2FX SM ST	2702333	1

Accessories

SD FLASH 2GB	2988162	1

2000 series Managed Switches with SFP glass fiber connections

2200 and 2300 Managed Switches with SFP ports guarantee maximum flexibility in applications. Depending on the chosen SFP module, cable lengths of up to 80 km are possible.

Features:

– Media Redundancy Protocol (MRP) according to IEC 62439
– Extended temperature range (-40 °C ... +70 °C)
– Redundant power supply
– IGMP snooping/querier
– HTTPS/SNMPv3
– Port-based/pool-based DHCP server, DHCP option 82

new

Ethernet

4 RJ45 ports, 2 SFP ports, and 2 Fast Ethernet combo ports

Technical data

Ethernet interface		
Number of ports		4 (RJ45 ports)
Transmission speed		10/100 Mbps
Fiber optic interface		
Number of ports		2 (Combo ports)
Transmission speed		100 Mbps (full duplex)
Transmission length		up to 40 km (Depending on the fiber/SFP module used)
Fiber optic interface		
Number of ports		2 (SFP module)
Transmission speed		100 Mbps (full duplex)
Transmission length		up to 40 km (Depending on the fiber/SFP module used)
Function		
Basic functions		Store and Forward Swich, complies with IEEE 802.3
Management		Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Command-line interface (Telnet, SSH)
Diagnostics function		RMON History LLDP (Link Layer Discovery Protocol) SNMP-Traps ACD (Address Conflict Detection) N:1-Portmirroring
Redundancy		MRP (Media Redundancy Protocol) RSTP (Rapid Spanning Tree Protocol) FRD (Fast Ring Detection) Large Tree Support
Status and diagnostic indicators		LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link/Activity and Speed)
Power supply		
Supply voltage		24 V DC (redundant)
Residual ripple		3.6 V_{PP}
Supply voltage range		12 V DC ... 57 V DC
Typical current consumption		250 mA (at U_S = 24 V DC)
General data		
Dimensions	W / H / D	45 mm / 130 mm / 115 mm
Degree of protection		IP20
Ambient temperature (operation)		-40 °C ... 70 °C
Permissible humidity (operation)		10 % ... 95 % (non-condensing)
Noise emission		EN 61000-6-4
Noise immunity		EN 61000-6-2

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet switch	**FL SWITCH 2204-2TC-2SFX**	2702334	1

Accessories

Parameterization memory, flash card without license	**SD FLASH 2GB**	2988162	1

SFP module — **See page 424**

new

Ethernet

4 RJ45 ports, 2 SFP ports, and 2 Gigabit combo ports

Technical data

4 (RJ45 ports)
10/100/1000 Mbps

2 (Combo ports)
100/1000 Mbps (full duplex)
up to 80 km (Depending on the fiber/SFP module used)

2 (SFP module)
100/1000 Mbps (full duplex)
up to 80 km (Depending on the fiber/SFP module used)

Store and Forward Swich, complies with IEEE 802.3

Web-based management (HTTP/HTTPS)
SNMPv1/v2/v3
Command-line interface (Telnet, SSH)
RMON History
LLDP (Link Layer Discovery Protocol)
SNMP-Traps
ACD (Address Conflict Detection)
N:1-Portmirroring
MRP (Media Redundancy Protocol)
RSTP (Rapid Spanning Tree Protocol)
FRD (Fast Ring Detection)
Large Tree Support
LEDs: US1, US2 (power supply), Fail (alarm contact),
2 LEDs per Ethernet port (Link/Activity and Speed)

24 V DC (redundant)
3.6 V_{PP}
12 V DC ... 57 V DC
290 mA (at U_S = 24 V DC)

45 mm / 130 mm / 115 mm
IP20
-40 °C ... 70 °C
10 % ... 95 % (non-condensing)
EN 61000-6-4
EN 61000-6-2

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2304-2GC-2SFP	**2702653**	1

Accessories

SD FLASH 2GB	**2988162**	1

See page 424

3000 series Managed Switches

The **FL SWITCH 3000** industrial Managed Switches provide scalable power for application flexibility and ease of use.

Features:

– Standard (-10 °C ... +60 °C) and wide temperature (-40 °C ... +75 °C) devices available
– Extended Ring Redundancy provides a 15 ms recovery time
– Extensive IEEE and security functions

Ethernet

5/8 RJ45 ports

Ethernet

16 RJ45 ports

Ex:

Ex:

		Technical data		Technical data	
		FL SWITCH 3005	FL SWITCH 3008T	FL SWITCH 3016	FL SWITCH 3016T
Ethernet interface					
Number of ports		5 (RJ45 ports)	8 (RJ45 ports)	16 (RJ45 ports)	
Transmission speed		10/100 Mbps (with auto negotiation)		10/100 Mbps (with auto negotiation)	
Fiber optic interface					
Number of ports		-		-	
Transmission speed		-		-	
Wavelength		-		-	
Transmission length		-		-	
Function					
Basic functions		Managed switch		Managed switch	
Status and diagnostic indicators		LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port		LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
Power supply					
Supply voltage		24 V DC (redundant)		24 V DC (redundant)	
Residual ripple		3.6 V_{PP}		3.6 V_{PP}	
Supply voltage range		12 V DC ... 48 V DC		12 V DC ... 48 V DC	
Typical current consumption		200 mA (at U_S = 24 V DC)	210 mA (at U_S = 24 V DC)	312 mA (24 V DC)	
General data					
Dimensions	W / H / D	54.4 mm / 146.4 mm / 125 mm		66 mm / 173 mm / 140 mm	
Degree of protection		IP20		IP20	
Ambient temperature (operation)		-10 °C ... 60 °C	-40 °C ... 75 °C	-10 °C ... 60 °C	-40 °C ... 75 °C
Permissible humidity (operation)		5 % ... 95 % (non-condensing)		5 % ... 95 % (non-condensing)	
Noise emission		EN 61000-6-4		EN 61000-6-4	
Noise immunity		EN 61000-6-2:2005		EN 61000-6-2:2005	
EMC note		Class A product, see page 525		Class A product, see page 525	

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Ethernet switch						
- 5 RJ45 ports	**FL SWITCH 3005**	2891030	1			
- 8 RJ45 ports	**FL SWITCH 3008**	2891031	1			
- 16 RJ45 ports				**FL SWITCH 3016**	2891058	1
Ethernet switch, wide temperature						
- 5 RJ45 ports	**FL SWITCH 3005T**	2891032	1			
- 8 RJ45 ports	**FL SWITCH 3008T**	2891035	1			
- 16 RJ45 ports				**FL SWITCH 3016T**	2891059	1
- 4 RJ45 ports, 1 SC FO port						
- 4 RJ45 ports, 1 ST FO port						
- 6 RJ45 ports, 2 SC FO ports						
- 6 RJ45 ports, 2 ST FO ports						

Ethernet

4 RJ45 ports and
1 fiber optic port (multi-mode)

Ex:

Technical data

FL SWITCH 3004T-FX	FL SWITCH 3004T-FX ST
4 (RJ45 ports)	
10/100 Mbps (with auto negotiation)	
1 (SC multi-mode)	1 (ST multi-mode)
100 Mbps (full duplex)	
1300/1310 nm	
12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	
Managed switch	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
24 V DC (redundant)	
3.6 V_{PP}	
12 V DC ... 48 V DC	
230 mA (at U_S = 24 V DC)	
54.4 mm / 146.4 mm / 125 mm	
IP20	
-40 °C ... 75 °C	
5 % ... 95 % (non-condensing)	
EN 61000-6-4	
EN 61000-6-2:2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 3004T-FX	**2891033**	1
FL SWITCH 3004T-FX ST	**2891034**	1

Ethernet

6 RJ45 ports and
2 fiber optic ports (multi-mode)

Ex:

Technical data

FL SWITCH 3006T-2FX	FL SWITCH 3006T-2FX ST
6 (RJ45 ports)	
10/100 Mbps (with auto negotiation)	
2 (SC multi-mode)	2 (ST multi-mode)
100 Mbps (full duplex)	
1300/1310 nm	
12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	
Managed switch	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
24 V DC (redundant)	
3.6 V_{PP}	
12 V DC ... 48 V DC	
330 mA (at U_S = 24 V DC)	
54.4 mm / 146.4 mm / 125 mm	
IP20	
-40 °C ... 75 °C	
5 % ... 95 % (non-condensing)	
EN 61000-6-4	
EN 61000-6-2:2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 3006T-2FX	**2891036**	1
FL SWITCH 3006T-2FX ST	**2891037**	1

6 RJ45 ports and
2 fiber optic ports (single-mode)

Ex:

Technical data

6 (RJ45 ports)
10/100 Mbps (with auto negotiation)
2 (SC single-mode)
100 Mbps (full duplex)
1300/1310 nm
40 km
Managed switch
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port
24 V DC (redundant)
3.6 V_{PP}
12 V DC ... 48 V DC
330 mA (at U_S = 24 V DC)
54.4 mm / 146.4 mm / 125 mm
IP20
-40 °C ... 75 °C
5 % ... 95 % (non-condensing)
EN 61000-6-4
EN 61000-6-2:2005
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 3006T-2FX SM	**2891060**	1

4000 series Managed Gigabit Switches

The **FL SWITCH 4000** infrastructure Managed Switches provide gigabit trunk ports and can be flexibly scaled in their performance while maintaining ease of operation.

Features:

– 2 Gigabit ports for high performance data trunk lines
– Extended temperature range for harsh environments (-40°C ... +75°C)
– Extended Ring Redundancy provides a 15 ms recovery time
– Extensive IEEE and security functions
– Flexible fiber interface options

Ethernet

8 RJ45 ports and 2 SFP ports

Ex:

Technical data

Ethernet interface		
Number of ports		8 (RJ45 ports)
Transmission speed		10/100 Mbps
Gigabit Ethernet interface		
Number of ports		-
Transmission speed		-
Fiber optic interface		
Number of ports		2 (SFP ports)
Transmission speed		1000 Mbps (full duplex)
Wavelength		-
Transmission length		up to 80 km (Depending on the fiber/SFP module used)
Function		
Basic functions		Managed switch
Status and diagnostic indicators		LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port
Power supply		
Supply voltage		24 V DC (redundant)
Residual ripple		3.6 V_{PP}
Supply voltage range		12 V DC ... 48 V DC
Typical current consumption		278 mA (at U_S = 24 V DC)
General data		
Dimensions	W / H / D	54.4 mm / 146.4 mm / 125 mm
Degree of protection		IP20
Ambient temperature (operation)		-40 °C ... 75 °C
Permissible humidity (operation)		5 % ... 95 % (non-condensing)
Noise emission		EN 61000-6-4
Noise immunity		EN 61000-6-2:2005
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet switch, wide temperature			
	FL SWITCH 4008T-2SFP	2891062	1

Accessories

SFP module	**See page 424**

Ethernet

10 RJ45 ports and
4 fiber optic ports (single-mode)

Ex:

Technical data

8 (RJ45 ports) 10/100 Mbps
2 (RJ45 ports) 10/100/1000 Mbps
4 (SC single-mode) 100 Mbps (full duplex) 1300/1310 nm 40 km (fiberglass with F-G 9/125 0.36 dB/km)
Managed switch LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port
24 V DC (redundant) 3.6 V_{PP} 12 V DC ... 48 V DC 488 mA (24 V DC)
66 mm / 173 mm / 140 mm IP20 -40 °C ... 75 °C 5 % ... 95 % (non-condensing) EN 61000-6-4 EN 61000-6-2:2005 Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 4008T-2GT-4FX SM	**2891061**	1

Accessories

Ethernet

14 RJ45 ports and
2 fiber optic ports (multi-mode)

Ex:

Technical data

12 (RJ45 ports) 10/100 Mbps
2 (RJ45 ports) 10/100/1000 Mbps
2 (SC multi-mode) 100 Mbps (full duplex) 1300/1310 nm 8 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)
Managed switch LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port
24 V DC (redundant) 3.6 V_{PP} 12 V DC ... 48 V DC 474 mA (24 V DC)
66 mm / 173 mm / 140 mm IP20 -40 °C ... 75 °C 5 % ... 95 % (non-condensing) EN 61000-6-4 EN 61000-6-2:2005 Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 4012T-2GT-2FX	**2891063**	1

Accessories

SMN series Managed Switches

Smart Managed Narrow Switches are Ethernet switches that are suitable for industrial use with eight Fast Ethernet ports.

Features:

– Optimized for use in PROFINET RT and EtherNet/IP™ applications
– Pure copper version with activated PROFINET function available
– Versions with two fiber optic ports in various designs available

Ethernet

PROFINET

8 RJ45 ports

Technical data

Ethernet interface		
Number of ports		8 (RJ45 ports)
Transmission speed		10/100 Mbps
Fiber optic interface		
Number of ports		-
Transmission speed		-
Wavelength		-
Transmission length		-
Other connections		
Serial (RS-232)		RS-232-C, 6-pos. MINI-DIN socket (PS/2)
Function		
Basic functions		Store and Forward Swich complies with IEEE 802.3 4 priority classes in acc. with IEEE 802.1 P TCP/IP protocol, BootP-capable, port-mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), PROFINET Device, Media Redundancy Protocol (MRP).
Status and diagnostic indicators		LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex)
Power supply		
Supply voltage		24 V DC (redundant)
Residual ripple		3.6 V_{PP}
Supply voltage range		18 V DC ... 32 V DC
Typical current consumption		250 mA (at U_S = 24 V DC)
General data		
Dimensions	W / H / D	57 mm / 133 mm / 125 mm
Degree of protection		IP20
Ambient temperature (operation)		0 °C ... 55 °C (non-condensing)
Permissible humidity (operation)		5 % ... 95 % (non-condensing)
Noise emission		EN 61000-6-4:2007 + A1:2011
Noise immunity		EN 61000-6-2:2005
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Smart Managed Narrow Switch - 8 RJ45 ports - 6 RJ45 ports, 2 POF FO ports - 6 RJ45 ports, 2 SC FO ports	**FL SWITCH SMN 8TX-PN**	2989501	1

Accessories

Configuration memory, replaceable	**FL MEM PLUG**	2891259	1
Configuration memory, replaceable with MRM function	**FL MEM PLUG/MRM**	2891275	1

Ethernet

PROFINET

6 RJ45 Ports and 2 FO Ports

Technical data

6 (RJ45 ports) 10/100 Mbps
2 (SC-RJ) 10/100 Mbps (full duplex) 650 nm up to 250 m (depending on the fiber used)
RS-232-C, 6-pos. MINI-DIN socket (PS/2)
Store and Forward Swich complies with IEEE 802.3 4 priority classes in acc. with IEEE 802.1 P TCP/IP protocol, BootP-capable, port-mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), PROFINET Device, Media Redundancy Protocol (MRP). LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex)
24 V DC (redundant) 3.6 V_{PP} 18 V DC ... 32 V DC 340 mA (at U_S = 24 V DC)
57 mm / 133 mm / 125 mm IP20 0 °C ... 55 °C (non-condensing) 5 % ... 95 % (non-condensing) EN 61000-6-4:2007 + A1:2011 EN 61000-6-2:2005 Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SMN 6TX/2POF-PN	2700290	1

Accessories

FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1

Ethernet

PROFINET

new

6 RJ45 ports and
2 fiber optic ports (multi-mode)

Technical data

6 (RJ45 ports) 10/100 Mbps
2 (SC multi-mode) 100 Mbps (full duplex) 1300 nm 11000 m (fiberglass with F-G 62.5/125 0.7 dB/km F1000)
RS-232-C, 6-pos. MINI-DIN socket (PS/2)
Store and Forward Swich complies with IEEE 802.3 4 priority classes in acc. with IEEE 802.1 P TCP/IP protocol, BootP-capable, port-mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), PROFINET Device, Media Redundancy Protocol (MRP). LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex)
24 V DC (redundant) 3.6 V_{PP} 18 V DC ... 32 V DC 350 mA (at U_S = 24 V DC)
57 mm / 133 mm / 125 mm IP20 0 °C ... 55 °C (non-condensing) 5 % ... 95 % (non-condensing) EN 61000-6-4:2007 + A1:2011 EN 61000-6-2:2005 Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SMN 6TX/2FX	2989543	1

Accessories

FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1

Ethernet

PROFINET

new

6 RJ45 ports and
2 fiber optic ports (single-mode)

Technical data

6 (RJ45 ports) 10/100 Mbps
2 (SC single-mode) 100 Mbps (full duplex) 1300 nm 36000 m (fiberglass with F-G 9/125 0.36 dB/km)
RS-232-C, 6-pos. MINI-DIN socket (PS/2)
Store and Forward Swich complies with IEEE 802.3 4 priority classes in acc. with IEEE 802.1 P TCP/IP protocol, BootP-capable, port-mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), PROFINET Device, Media Redundancy Protocol (MRP). LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex)
24 V DC (redundant) 3.6 V_{PP} 18 V DC ... 32 V DC 325 mA (at U_S = 24 V DC)
57 mm / 133 mm / 125 mm IP20 0 °C ... 55 °C (non-condensing) 5 % ... 95 % (non-condensing) EN 61000-6-4:2007 + A1:2011 EN 61000-6-2:2005 Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SMN 6TX/2FX SM	2989556	1

Accessories

FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1

SMCS series Managed Switches

Smart Managed Switches offer excellent realtime properties with high data throughput at the same time.

The industrial DIN rail switches support Fast Ethernet or Gigabit on all ports and are ideal for use in the PROFINET RT or EtherNet/IP™ environment.

The **FL SWITCH SMCS 8GT** and **6GT/2SFP** Gigabit versions also have maritime approvals GL, BV, ABS, LR, and DNV.

All eight-port versions of the SMCS switches can be used in Ex zone II.

All devices support:

– RSTP
– MRP (client and master)
– VLANs
– SNMP

Ethernet

8 RJ45 ports

Technical data

		FL SWITCH SMCS 8TX	FL SWITCH SMCS 8GT
Ethernet interface			
Number of ports		8 (RJ45 ports)	
Transmission speed		10/100 Mbps	10/100/1000 Mbps
Fiber optic interface			
Number of ports		-	
Transmission speed		-	
Wavelength		-	
Transmission length		-	
		-	
Other connections			
Serial (RS-232)		RS-232-C, 6-pos. MINI-DIN socket (PS/2)	
Function			
Basic functions		Store and Forward Swich complies with IEEE 802.3 4 priority classes in acc. with IEEE 802.1 P TCP/IP protocol, BootP-capable, port-mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), PROFINET Device, Media Redundancy Protocol (MRP).	
Status and diagnostic indicators		LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex)	
Power supply			
Supply voltage		24 V DC (redundant)	
Residual ripple		3.6 V_{PP}	
Supply voltage range		18 V DC ... 32 V DC	
Typical current consumption		240 mA (at U_S = 24 V DC)	450 mA (at U_S = 24 V DC)
General data			
Dimensions	W / H / D	128 mm / 110 mm / 69 mm	
Degree of protection		IP20	
Ambient temperature (operation)		0 °C ... 55 °C (non-condensing)	
Permissible humidity (operation)		5 % ... 95 % (non-condensing)	
Noise emission		EN 61000-6-3 +A11	
Noise immunity		EN 61000-6-2:2005	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Smart Managed Compact Switch			
- 8 RJ45 ports	**FL SWITCH SMCS 8TX**	2989226	1
- 8 RJ45 ports, preconfigured for PROFINET	**FL SWITCH SMCS 8TX-PN**	2989103	1
- 8 RJ45 ports, 1000 Mbps	**FL SWITCH SMCS 8GT**	2891123	1
- 6 RJ45 ports, 2 SFP FO ports			
- 6 RJ45 ports, 2 SFP FO ports, 1000 Mbps			
- 16 RJ45 ports			
- 14 RJ45 ports, 2 SC FO ports (multi-mode)			
- 14 RJ45 ports, 2 SC FO ports (single-mode)			

Accessories

Configuration memory, replaceable	**FL MEM PLUG**	2891259	1
Configuration memory, replaceable with MRM function	**FL MEM PLUG/MRM**	2891275	1

SFP module

Ethernet

6 RJ45 ports and 2 SFP ports

Technical data

FL SWITCH SMCS 6TX/2SFP	FL SWITCH SMCS 6GT/2SFP
6 (RJ45 ports)	
10/100 Mbps	10/100/1000 Mbps
2 (SFP ports)	
1000 Mbps (full duplex)	
-	
up to 80 km (Depending on the fiber/SFP module used)	
-	
RS-232-C, 6-pos. MINI-DIN socket (PS/2)	
Store and Forward Swich complies with IEEE 802.3 4 priority classes in acc. with IEEE 802.1 P TCP/IP protocol, BootP-capable, port-mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), PROFINET Device, Media Redundancy Protocol (MRP).	
LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex)	
24 V DC (redundant)	
3.6 V_{PP}	
18 V DC ... 32 V DC	
600 mA (at U_S = 24 V DC)	
128 mm / 110 mm / 69 mm	
IP20	
0 °C ... 55 °C (non-condensing)	
5 % ... 95 % (non-condensing)	
EN 61000-6-3 +A11	
EN 61000-6-2:2005	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SMCS 6TX/2SFP	2989323	1
FL SWITCH SMCS 6GT/2SFP	2891479	1

Accessories

FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1

See page 424

Ethernet

16 RJ45 ports

Technical data

16 (RJ45 ports)	
10/100 Mbps	
-	
-	
-	
-	
-	
RS-232-C, 6-pos. MINI-DIN socket (PS/2)	
Store and Forward Swich complies with IEEE 802.3 4 priority classes in acc. with IEEE 802.1 P TCP/IP protocol, BootP-capable, port-mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), PROFINET Device, Media Redundancy Protocol (MRP).	
LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex)	
24 V DC (redundant)	
3.6 V_{PP}	
18 V DC ... 32 V DC	
200 mA (at U_S = 24 V DC)	
214 mm / 110 mm / 69 mm	
IP20	
-40 °C ... 70 °C (non-condensing)	
5 % ... 95 % (non-condensing)	
EN 61000-6-3	
EN 61000-6-2:2005	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SMCS 16TX	2700996	1

Accessories

FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1

Ethernet

14 RJ45 ports and 2 FO ports

Technical data

FL SWITCH SMCS 14TX/2FX	FL SWITCH SMCS 14TX/2FX-SM
14 (RJ45 ports)	
10/100 Mbps	
2 (SC multi-mode)	2 (SC single-mode)
100 Mbps (full duplex)	
1310 nm	
10000 m (depending on the fiber used)	36000 m (fiberglass with F-G 9/125 0.36 dB/km)
6400 m (fiberglass with F-G 50/125 0.7 dB/km F1200)	32000 m (fiberglass with F-G 9/125 0.4 dB/km)
RS-232-C, 6-pos. MINI-DIN socket (PS/2)	
Store and Forward Swich complies with IEEE 802.3 4 priority classes in acc. with IEEE 802.1 P TCP/IP protocol, BootP-capable, port-mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), PROFINET Device, Media Redundancy Protocol (MRP).	
LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex)	
24 V DC (redundant)	
3.6 V_{PP}	
18 V DC ... 32 V DC	
290 mA (at U_S = 24 V DC)	
214 mm / 110 mm / 69 mm	
IP20	
-40 °C ... 70 °C (non-condensing)	
5 % ... 95 % (non-condensing)	
EN 61000-6-3	
EN 61000-6-2:2005	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SMCS 14TX/2FX	2700997	1
FL SWITCH SMCS 14TX/2FX-SM	2701466	1

Accessories

FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1

Switches for PROFINET IRT

The IRT switches are particularly suitable for high-performance PROFINET networks.

The FL SWITCH IRT switches use built-in ERTEC (Enhanced Real Time Ethernet Controller) technology to forward PROFINET data packets at the fastest possible speeds via the cut through process.

In addition, PROFINET data packets are always delivered with the highest priority to the receiver independently of other data traffic.

The FL SWITCH IRT switches can be fully configured and monitored via STEP7 and PC Worx.

Features:

– Easy integration into a PROFINET network
– Extended temperature range (-25°C ... +60°C)
– POF interfaces for use in areas heavily affected by EMC
– Path length measurement
– Fiber optic diagnostics
– MRP client

Ethernet

4 RJ45 Ports

Technical data

Ethernet interface		
Number of ports		4 (RJ45 ports)
Transmission speed		10/100 Mbps
Fiber optic interface		
Number of ports		-
Transmission speed		-
Wavelength		-
Transmission length		-
Function		
Basic functions		Cut-through/Store and Forward Swich complies with IEEE 802.3 2 priority classes in accordance with IEEE802.1 P, TCP/IP protocol, DCP capable, integrated web server function, PROFINET device.
Status and diagnostic indicators		LEDs: US1, US2 (power supply), Fail (alarm contact), 3 LEDs per Ethernet port (Link, Activity, and FO status), and BF (Bus Fail)
Power supply		
Supply voltage		24 V DC (redundant)
Residual ripple		3.6 V_{PP}
Supply voltage range		18.5 V DC ... 30.2 V DC
Typical current consumption		165 mA (at U_S = 24 V DC)
General data		
Dimensions	W / H / D	127 mm / 95 mm / 69 mm
Degree of protection		IP20
Ambient temperature (operation)		-25 °C ... 60 °C
Permissible humidity (operation)		5 % ... 95 % (non-condensing)
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet switch for PROFINET applications - 4 RJ45 ports - 2 RJ45 ports, 2 POF SC-RJ ports - 1 RJ45 port, 3 POF SC-RJ ports	**FL SWITCH IRT 4TX**	2700689	1

Accessories

Configuration memory, replaceable	**FL MEM PLUG**	2891259	1
Configuration memory, replaceable with MRM function	**FL MEM PLUG/MRM**	2891275	1

Ethernet

2 RJ45 ports and 2 POF SC-RJ ports

Technical data

2 (RJ45 ports) 10/100 Mbps
2 (SC-RJ) 100 Mbps (full duplex) 650 nm up to 250 m (depending on the fiber used)
Cut-through/Store and Forward Swich complies with IEEE 802.3 2 priority classes in accordance with IEEE802.1 P, TCP/IP protocol, DCP capable, integrated web server function, PROFINET device. LEDs: US1, US2 (power supply), Fail (alarm contact), 3 LEDs per Ethernet port (Link, Activity, and FO status), and BF (Bus Fail)
24 V DC (redundant) 3.6 V_{PP} 18.5 V DC ... 30.2 V DC 235 mA (at U_S = 24 V DC)
127 mm / 95 mm / 69 mm IP20 -25 °C ... 60 °C 5 % ... 95 % (non-condensing) Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH IRT 2TX 2POF	2700691	1

Accessories

FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1

Ethernet

1 RJ45 port and 3 POF SC-RJ ports

Technical data

1 (RJ45 ports) 10/100 Mbps
3 (SC-RJ) 100 Mbps (full duplex) 650 nm up to 250 m (depending on the fiber used)
Cut-through/Store and Forward Swich complies with IEEE 802.3 2 priority classes in accordance with IEEE802.1 P, TCP/IP protocol, DCP capable, integrated web server function, PROFINET device. LEDs: US1, US2 (power supply), Fail (alarm contact), 3 LEDs per Ethernet port (Link, Activity, and FO status), and BF (Bus Fail)
24 V DC (redundant) 3.6 V_{PP} 18.5 V DC ... 30.2 V DC 270 mA (at U_S = 24 V DC)
127 mm / 95 mm / 69 mm IP20 -25 °C ... 60 °C 5 % ... 95 % (non-condensing) Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH IRT TX 3POF	2700692	1

Accessories

FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1

Ethernet

1 RJ45 port and 3 POF SC-RJ ports, for wall mounting

Technical data

1 (RJ45 ports) 10/100 Mbps
3 (SC-RJ) 100 Mbps (full duplex) 650 nm up to 250 m (depending on the fiber used)
Cut-through/Store and Forward Swich complies with IEEE 802.3 2 priority classes in accordance with IEEE802.1 P, TCP/IP protocol, DCP capable, integrated web server function, PROFINET device. LEDs: US1, US2 (power supply), Fail (alarm contact), 3 LEDs per Ethernet port (Link, Activity, and FO status), and BF (Bus Fail)
24 V DC (redundant) 3.6 V_{PP} 18.5 V DC ... 30.2 V DC 260 mA (at U_S = 24 V DC)
176 mm / 112 mm / 99 mm IP67 -25 °C ... 60 °C 5 % ... 95 % (non-condensing) Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH IRT IP TX/3POF	2700697	1

Accessories

FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1

7000 series Managed Switches

The automation switches in the 7000 series are switches that support direct integration into a Device Level Ring (DLR). Direct integration of the switches into the DLR is a considerable advantage when installing and operating EtherNet/IP™ networks.

Up to six devices can be integrated into a DLR via the FL SWITCH 7000. In system networks, the switches allow the redundant rings to be connected to the higher-level networking level. In this way, you can create networks with minimal switch-over times of less than three milliseconds (< 3 ms).

The Managed Switches of the 7000 series communicate directly via the Common Industrial Protocol (CIP) in the EtherNet/IP™ network. Via CIP, you can integrate the switch into an EtherNet/IP™ control system from where it can be configured and diagnosed.

Pure copper versions and versions with up to four fiberglass ports are available for flexible use. The range also includes versions for Gigabit transmission and combo ports for free selection of the transmission medium (RJ45 or SFP).

Features:

– Slim design
– Extended temperature range (-40 °C ... +70 °C)
– VLANs
– Common Industrial Protocol (CIP)
– Device Level Ring (DLR)
– RSTP
– Web-based management
– Port-based/pool-based DHCP server, DHCP option 82
– HTTPS/SNMPv3

Ethernet

EtherNet/IP

8 RJ45 ports

Ex:

Technical data

Ethernet interface		
Number of ports		8 (RJ45 ports)
Transmission speed		10/100 Mbps
Fiber optic interface		
Number of ports		-
Transmission speed		-
Wavelength		-
Transmission length		-
Fiber optic interface		
Number of ports		-
Transmission speed		-
Wavelength		-
Transmission length		-
Function		
Basic functions		Store and Forward Swich, complies with IEEE 802.3
Management		Web-based management (HTTP/HTTPS) SNMPv1/v2/v3
Diagnostics function		Remanente Event-Table RMON History N:1-Portmirroring LLDP (Link Layer Discovery Protocol) SNMP-Traps ACD (Address Conflict Detection)
Redundancy		DLR (Device Level Ring) RSTP (Rapid Spanning Tree Protocol) FRD (Fast Ring Detection) Large Tree Support
Additional function		MAC-based Port Security
Status and diagnostic indicators		LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex) EtherNet/IP™ status LED: Net, Mod
Power supply		
Supply voltage		24 V DC (redundant)
Residual ripple		3.6 V_{PP}
Supply voltage range		12 V DC ... 58 V DC
Typical current consumption		350 mA (at U_S = 24 V DC)
General data		
Dimensions	W / H / D	60 mm / 130 mm / 135.5 mm
Degree of protection		IP20
Ambient temperature (operation)		-40 °C ... 70 °C
Permissible humidity (operation)		10 % ... 95 % (non-condensing)
Noise emission		EN 61000-6-4
Noise immunity		EN 61000-6-2:2005
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet switch	**FL SWITCH 7008-EIP**	2701418	1

Accessories

SFP module

Ethernet

EtherNet/IP

6 / 5 RJ45 ports and
2 / 3 fiber optic ports

Ex:

Technical data	
FL SWITCH 7006/2FX-EIP	FL SWITCH 7005/FX-2FXSM-EIP
6 (RJ45 ports)	5 (RJ45 ports)
10/100 Mbps	
2 (SC multi-mode)	1 (SC multi-mode)
100 Mbps (full duplex)	
1300 nm	
11000 m (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	
-	2 (SC single-mode)
-	100 Mbps (full duplex)
-	1300 nm
-	36000 m (fiberglass with F-G 9/125 0.36 dB/km)
Store and Forward Swich, complies with IEEE 802.3	
Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Remanente Event-Table RMON History N:1-Portmirroring LLDP (Link Layer Discovery Protocol) SNMP-Traps ACD (Address Conflict Detection) DLR (Device Level Ring) RSTP (Rapid Spanning Tree Protocol) FRD (Fast Ring Detection) Large Tree Support MAC-based Port Security	
LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex) EtherNet/IP™ status LED: Net, Mod	
24 V DC (redundant)	
3.6 V_{PP}	
12 V DC ... 58 V DC	
470 mA (at U_S = 24 V DC)	520 mA (at U_S = 24 V DC)
60 mm / 130 mm / 135.5 mm	
IP20	
-40 °C ... 70 °C	
10 % ... 95 % (non-condensing)	
EN 61000-6-4	
EN 61000-6-2:2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 7006/2FX-EIP	2701419	1
FL SWITCH 7005/FX-2FXSM-EIP	2701420	1

Accessories

new

Ethernet

EtherNet/IP

6 / 4 RJ45 ports and
2 / 4 Gigabit combo ports (SFP or RJ45)

Technical data	
FL SWITCH 7006-2GC-EIP	FL SWITCH 7004-4GC-EIP
6 (RJ45 ports)	4 (RJ45 ports)
10/100 Mbps	
2 (Combo ports)	4 (Combo ports)
10/100/1000 Mbps (full duplex)	
-	
up to 80 km (Depending on the fiber/SFP module used)	
-	
-	
-	
-	
Store and Forward Swich, complies with IEEE 802.3	
Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Remanente Event-Table RMON History N:1-Portmirroring LLDP (Link Layer Discovery Protocol) SNMP-Traps ACD (Address Conflict Detection) DLR (Device Level Ring) RSTP (Rapid Spanning Tree Protocol) FRD (Fast Ring Detection) Large Tree Support MAC-based Port Security	
LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex) EtherNet/IP™ status LED: Net, Mod	
24 V DC (redundant)	
3.6 V_{PP}	
12 V DC ... 58 V DC	
520 mA (at U_S = 24 V DC)	535 mA (at U_S = 24 V DC)
60 mm / 130 mm / 135.5 mm	
IP20	
-40 °C ... 70 °C	
10 % ... 95 % (non-condensing)	
EN 61000-6-4	
EN 61000-6-2:2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 7006-2GC-EIP	2701554	1
FL SWITCH 7004-4GC-EIP	2701553	1

Accessories

See page 424

new

Ethernet

EtherNet/IP

4 RJ45 ports, 2 Fast Ethernet and
2 Gigabit combo ports (SFP or RJ45)

Technical data
4 (RJ45 ports)
10/100 Mbps
2 (Combo ports)
10/100/1000 Mbps (full duplex)
-
up to 80 km (Depending on the fiber/SFP module used)
2 (Combo ports)
10/100 Mbps (full duplex)
-
up to 40 km (Depending on the fiber/SFP module used)
Store and Forward Swich, complies with IEEE 802.3
Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Remanente Event-Table RMON History N:1-Portmirroring LLDP (Link Layer Discovery Protocol) SNMP-Traps ACD (Address Conflict Detection) DLR (Device Level Ring) RSTP (Rapid Spanning Tree Protocol) FRD (Fast Ring Detection) Large Tree Support MAC-based Port Security
LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex) EtherNet/IP™ status LED: Net, Mod
24 V DC (redundant)
3.6 V_{PP}
12 V DC ... 58 V DC
560 mA (at U_S = 24 V DC)
60 mm / 130 mm / 135.5 mm
IP20
-40 °C ... 70 °C
10 % ... 95 % (non-condensing)
EN 61000-6-4
EN 61000-6-2:2005
Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 7004-2TC-2GC-EIP	2702175	1

Accessories

See page 424

Routers

The NAT switch combines the functions of a NAT router and a switch in a single device. Thanks to 1:1 NAT or virtual NAT, the **FL NAT SMN 8TX** enables individual machines or systems to always be assigned the same IP addresses and for these IP addresses to then be implemented in the IP address area of the higher-level company network.

The device is also available as a maritime version, with all common maritime approvals.

Gigabit Modular Switches

The high-performance Gigabit Modular Switch can be extended to up to 28 ports with any transmission medium.

Features:

- Up to 12 integrated ports with 1000 Mbps data transmission
- Connection of connection media that can be assembled in the field, such as POF, PCF, and GI PCF
- Connection of Gigabit fiberglass via SFP plug-in modules
- Quick and easy local configuration options with the new operator/display interface
- Security in the automation network according to IEEE 802.1X
- Optional Layer 3 functions can be activated
- Static and dynamic routing
- Port- and VLAN-based routing

Ethernet

NAT switch with 8 RJ45 ports

Technical data

		FL NAT SMN 8TX	FL NAT SMN 8TX-M
SFP interface			
Number of ports		-	
Transmission speed		-	
Copper interface			
Number of ports		8 (RJ45 ports)	
Transmission speed		10/100 Mbps	
Interface extension			
Number of ports		-	
Note on connection method		-	
Transmission speed		-	
Transmission physics		-	
Function			
Basic functions		Store and Forward Swich, complies with IEEE 802.3 2, priority classes in acc. with IEEE 802.1 P TCP/IP protocol, BootP-capable, integrated web server function, Rapid Spanning Tree (RSTP), router, 1:1 NAT router	
Power supply			
Supply voltage		24 V DC (redundant)	
Supply voltage range		18 V DC ... 32 V DC	
Typical current consumption		600 mA (at U_S = 24 V DC)	
General data			
Dimensions	W / H / D	57 mm / 133 mm / 130 mm	
Degree of protection		IP20	
Ambient temperature (operation)		0 °C ... 55 °C (non-condensing)	
Noise emission		EN 61000-6-4:2007 + A1:2011	
Noise immunity		EN 61000-6-2:2005	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Smart Managed Narrow NAT Switch with 1:1 NAT router function			
- 8 RJ45 ports	**FL NAT SMN 8TX**	2989365	1
- 8 RJ45 ports, with maritime approvals	**FL NAT SMN 8TX-M**	2702443	1
Gigabit Modular Switch			
- 4 Gigabit ports and 12 Fast Ethernet ports			
- 12 Gigabit ports and 8 Fast Ethernet ports			
Extension			
- 8 Ethernet ports			

Accessories

Configuration memory, replaceable	**FL MEM PLUG**	2891259	1
Parameterization memory, replaceable with MRM function			
Parameterization memory, replaceable with MRM and Layer 3 function			
SFP module			

Ethernet

Head station, 8 - 16 ports

Head station, 12 - 20 ports

Extension, 8 ports

Technical data

4 (SFP ports or RJ45 ports) 1000 Mbps (full duplex)	4 (SFP ports) 1000 Mbps (full duplex)	- -
4 (RJ45 ports) 10/100 Mbps	8 (RJ45 ports) 10/100/1000 Mbps	- -
2 (Per interface module) Max. 4 interface modules (without extension) 10/100 Mbps (full duplex) multi-mode fiberglass Single-mode fiberglass POF-SCRJ GI-HCS fibers Copper PoE	2 (Per interface module) Max. 4 interface modules (without extension) 10/100 Mbps (full duplex) multi-mode fiberglass Single-mode fiberglass POF-SCRJ GI-HCS fibers Copper PoE	2 (Per interface module) Max. 4 interface modules 10/100 Mbps (full duplex) multi-mode fiberglass Single-mode fiberglass POF-SCRJ GI-HCS fibers Copper PoE
Store and Forward Swich complies with IEEE 802.3, 8 priority classes according to IEEE 802.1p, smart mode, port mirroring, multicast filtering, IGMP snooping, VLANs, Media Redundancy Protocol (MRP according to IEC 62439), Rapid Spanning Tree (RSTP), Fast Ring Detection (FRD), Large Tree Support, IEEE 802.1X security, port security, SNMPv3, HTTPS, PROFINET device, GMRP, GVRP, SNTP, 2 digital inputs	Store and Forward Swich complies with IEEE 802.3, 8 priority classes according to IEEE 802.1p, smart mode, port mirroring, multicast filtering, IGMP snooping, VLANs, Media Redundancy Protocol (MRP according to IEC 62439), Rapid Spanning Tree (RSTP), Fast Ring Detection (FRD), Large Tree Support, IEEE 802.1X security, port security, SNMPv3, HTTPS, PROFINET device, GMRP, GVRP, SNTP, 2 digital inputs	Extension module for Modular Managed Switch
24 V DC (redundant) 18.5 V DC ... 30.2 V DC 800 mA (Up to 2.5 A, depends on the configuration)	24 V DC (redundant) 18.5 V DC ... 30.2 V DC 800 mA (Up to 2.7 A, depends on the configuration)	- - via head station
287 mm / 125 mm / 115 mm IP20 -20 °C ... 55 °C (non-condensing) EN 61000-6-3/-4 EN 61000-6-2:2005	287 mm / 125 mm / 115 mm IP20 -20 °C ... 55 °C (non-condensing) EN 61000-6-3/-4 EN 61000-6-2:2005	127 mm / 125 mm / 115 mm IP20 -20 °C ... 55 °C (non-condensing) EN 61000-6-3/-4 EN 61000-6-2:2005

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH GHS 4G/12	2700271	1
FL SWITCH GHS 4G/12-L3	2700786	1

Accessories

SD FLASH 512MB	2988146	1
FL SD FLASH/MRM	2700270	1
FL SD FLASH/L3/MRM	2700607	1

See page 424

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH GHS 12G/8	2989200	1
FL SWITCH GHS 12G/8-L3	2700787	1

Accessories

SD FLASH 512MB	2988146	1
FL SD FLASH/MRM	2700270	1
FL SD FLASH/L3/MRM	2700607	1

See page 424

Ordering data

Type	Order No.	Pcs./Pkt.
FL FXT	2989307	1

Accessories

Interface modules

Highly modular 2-port interface modules allow a flexible cable exit: Either downward or to the front, depending on the requirements of the installation and location. There are interface modules for twisted pairs, fiberglass or the cost effective Ethernet installation with polymer and PCF fibers, all designed to carry out the particular job at hand.

Ethernet

TX ports

Ethernet

Fiber optic ports (multimode)

Ex:

Ex:

	Technical data		Technical data	
	FL IF 2TX VS-RJ-F	FL IF 2PSE-F	FL IF 2FX SC-F	FL IF 2FX ST-D
Ethernet interface				
Number of ports	2 (RJ45 ports)	2 (PoE ports)	-	
Transmission speed	10/100 Mbps (connection direction forwards)		-	
Fiber optic interface				
Number of ports	-		2 (SC multi-mode)	2 (ST multi-mode)
Transmission speed	-		100 Mbps	
Wavelength	-		1300 nm	
Transmission length	-		2800 m (fiberglass with F-G 50/125 1.6 dB/km F800)	10000 m (fiberglass with F-G 62.5/125 0.7 dB/km F1000)
	-		6400 m (fiberglass with F-G 50/125 0.7 dB/km F1200)	
	-		3000 m (fiberglass with F-G 62.5/125 2.6 dB/km F600)	
	-		2800 m (fiberglass with F-G 50/125 1.6 dB/km F800)	
Function				
Basic functions	Media module for modular managed switch	Media module for Modular Managed Switch with Power over Ethernet IEEE802.3af, Power Source Equipment (PSE)	Media module for modular managed switch	
Power supply				
Power supply connection	From FL SWITCH GHS or FXT		From FL SWITCH GHS or FXT	
Supply voltage	via head station	Internal / 48 V DC for PoE	via head station	
Typical current consumption	10 mA	10 mA (Max. 900 mA)	200 mA	
General data				
Dimensions W / H / D	31 mm / 75.7 mm / 75.5 mm	31 mm / 84.7 mm / 75.5 mm	31 mm / 75.7 mm / 72.5 mm	31 mm / 83 mm / 72.5 mm
Degree of protection	IP20		IP20	
Ambient temperature (operation)	-20 °C ... 55 °C (non-condensing)		0 °C ... 55 °C (non-condensing)	
Permissible humidity (operation)	10 % ... 95 % (non-condensing)		10 % ... 95 % (non-condensing)	
Noise emission	EN 61000-6-3/-4		EN 61000-6-3/-4	
Noise immunity	EN 61000-6-2:2005		EN 61000-6-2:2005	
EMC note	Class A product, see page 525		Class A product, see page 525	

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Interface module for Modular Managed Switch system						
- Exit to the front	**FL IF 2TX VS-RJ-F**	2832344	1			
- Exit downward	**FL IF 2TX VS-RJ-D**	2832357	1			
- Power-over-Ethernet, exit to the front	**FL IF 2PSE-F**	2832904	1			
Interface module, for connecting 100Base-FX fiberglass (1300 nm)						
- Outlet at the front, SC multimode				**FL IF 2FX SC-F**	2832412	1
- Outlet at the bottom, SC multimode				**FL IF 2FX SC-D**	2832425	1
- Outlet at the bottom, ST multimode				**FL IF 2FX ST-D**	2884033	1
- Outlet at the bottom, SC single-mode						
Interface modules, 2 ports, SC-RJ for POF/PCF, diagnosis-capable						
Configuration memory, replaceable						
- MRM function						

Ethernet

Fiber optic ports (single-mode)

Ex:

Ethernet

POF-SC-RJ ports

Configuration memory and MRP manager function

Technical data

2	
100 Mbps	
2	
100 Mbps	
1300 nm	
36000 m (fiberglass with F-G 9/125 0.36 dB/km)	
32000 m (fiberglass with F-G 9/125 0.4 dB/km)	
26000 m (fiberglass with F-G 9/125 0.5 dB/km)	
-	
Media module for modular managed switch	
From FL SWITCH GHS or FXT	
via head station	
200 mA	
31 mm / 85 mm / 72.5 mm	
IP20	
0 °C ... 55 °C (non-condensing)	
10 % ... 95 % (non-condensing)	
EN 61000-6-3/-4	
EN 61000-6-2:2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL IF 2FX SM SC-D	2832205	1

Technical data

-	
-	
2 (SC-RJ)	
100 Mbps	
650 nm	
50 m (including 3 dB system reserve, polymer fiber with F-K 980/1000 230 dB/km)	
100 m (PCF fiber with F-S 200/230 10 dB/km)	
250 m (GI HCS fiber with F-S 200/300, with 15 dB/km)	
-	
Media module for Modular Managed Switch with FO diagnosis	
From FL SWITCH GHS or FXT	
via head station	
200 mA	
31 mm / 73.5 mm / 72.5 mm	
IP20	
0 °C ... 55 °C (non-condensing)	
10 % ... 95 % (non-condensing)	
EN 61000-6-3/-4	
EN 61000-6-2:2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL IF 2POF SCRJ-D	2891084	1

Technical data

	FL MEM PLUG	FL MEM PLUG/MRM
	-	
	-	
	-	
	-	
	-	
	-	
	-	
	-	
	-	
	Configuration memory (plug-in)	Configuration memory and manager for the media redundancy protocol (MRP)
	From FL SWITCH MCS/SMCS	
	-	
	-	
	16 mm / 49 mm / -	
	IP20	
	0 °C ... 55 °C (non-condensing)	
	10 % ... 95 % (non-condensing)	
	EN 61000-6-3/-4	
	EN 61000-6-2:2005	
	Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1

SFP modules

The FL SFP... SFP modules are characterized by their high flexibility when used in switches.

IEC 61850-3

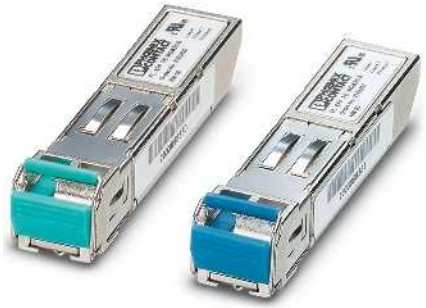
**Fiberglass,
for transmission ranges up to 40 km**

**Fiberglass,
for Gigabit transmission ranges up to 2 km**

	Technical data		Technical data	
	FL SFP FX	FL SFP FX SM	FL SFP SX	FL SFP SX2
Ethernet interface				
Number of ports	-		-	
Transmission speed	-		-	
Fiber optic interface				
Number of ports	1 (LC multi-mode)	1 (LC single-mode)	1 (LC multi-mode)	
Transmission speed	100 Mbps		1 Gbps	
Wavelength	1310 nm	1300 nm	850 nm	1310 nm
Transmission length	typ. 2 km	typ. 40 km	275 m (Fiberglass, 62.5/125 µm (OM1))	2 km (Fiberglass 50/125)
	-		550 m (Fiberglass, 50/125 µm (OM2))	1 km (Fiberglass 62.5/125)
	-		1000 m (Fiberglass, 50/125 µm (OM3))	-
	-		1000 m (Fiberglass, 50/125 µm (OM4))	-
Function				
Basic functions	SFP module as FO port		SFP module as FO port	
Power supply				
Power supply connection	via SFP slot		via SFP slot	
Supply voltage	3.3 V (via Factoryline switch)		3.3 V (via Factoryline switch)	
General data				
Ambient temperature (operation)	-40 °C ... 85 °C (non-condensing)		-40 °C ... 75 °C (non-condensing)	-40 °C ... 75 °C
Permissible humidity (operation)	30 % ... 95 % (non-condensing)		30 % ... 95 % (non-condensing)	-

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Small form plug-in (SFP) fiber module, 100 Mbps						
- Wavelength 1310 nm, multimode (2 km)	**FL SFP FX**	2891081	1			
- Wavelength 1300 nm, single-mode (40 km)	**FL SFP FX SM**	2891082	1			
Small form plug-in (SFP) fiber module, 1000 Mbps						
- Wavelength 850 nm, multimode (1 km)				**FL SFP SX**	2891754	1
- Wavelength 1310 nm, multimode (2 km)				**FL SFP SX2**	2702397	1
- Wavelength 1310 nm, single-mode (30 km)						
- Wavelength 1550 nm, single-mode (80 km)						
WDM20-SFP fiberglass module, 100 Mbps - Set consisting of WDM20-A and WDM20-B modules - A module: wavelength 1310/1550 nm, single-mode (20 km)						
- B module: wavelength 1550/1310 nm, single-mode (20 km)						
WDM10-SFP fiberglass module, 1000 Mbps - Set consisting of WDM10-A and WDM10-B modules - A module: wavelength 1310/1550 nm, single-mode (10 km)						
- B module: wavelength 1550/1310 nm, single-mode (10 km)						
Small form Pluggable (SFP) copper module, 1000 Mbps						
- SFP module with RJ45 connection						

Fiberglass,
for Gigabit transmission ranges up to 80 km



WDM technology,
for transmission via a single glass fiber

Gigabit transmission
with copper connection

Technical data

	FL SFP LX	FL SFP LH
	-	
	-	
	1 (LC single-mode)	
	1 Gbps	
	1310 nm	1550 nm
	30 km (Fiberglass 9/125)	80 km (Fiberglass 9/125)
	250 m (Fiberglass 62.5/125)	-
	-	
	-	
	SFP module as FO port	
	via SFP slot	
	3.3 V (via Factoryline switch)	
	-40 °C ... 85 °C (non-condensing)	
	30 % ... 95 % (non-condensing)	

Technical data

	FL SFP FE WDM20-SET	FL SFP WDM10-SET
	-	
	-	
	1 (LC single-mode)	
	100 Mbps	1 Gbps
	1310 nm / 1550 nm (TX)	
	20 km (Fiberglass 9/125)	10 km (Fiberglass 9/125)
	-	
	-	
	-	
	SFP module as FO port	
	via SFP slot	
	3.3 V (via Factoryline switch)	
	-40 °C ... 75 °C	
	-	

Technical data

	1 (RJ45 port)
	1 Gbps
	-
	-
	-
	-
	-
	-
	SFP module as copper port
	via SFP slot
	3.3 V (via Factoryline switch)
	-40 °C ... 85 °C (non-condensing)
	-

Ordering data

Type	Order No.	Pcs./Pkt.
FL SFP LX	2891767	1
FL SFP LH	2989912	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL SFP FE WDM20-SET	2702439	1
FL SFP FE WDM20-A	2702437	1
FL SFP FE WDM20-B	2702438	1
FL SFP WDM10-SET	2702442	1
FL SFP WDM10-A	2702440	1
FL SFP WDM10-B	2702441	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL SFP GT	2989420	1

Managed Switches

Ethernet switches control Ethernet traffic and maximize uptime. Operation in extreme environments is assured with a wide temperature range and an electrical noise immunity up to four times that of normal industrial switches.

Features:
– Extended Ring Redundancy provides a 15 ms recovery time
– Extensive IEEE and security functions

Ethernet

IEC 61850-3

16 RJ45 ports

Technical data

Ethernet interface		
Number of ports		16 (RJ45 ports)
Transmission speed		10/100 Mbps (with auto negotiation)
Fiber optic interface		
Number of ports		-
Transmission speed		-
Wavelength		-
Transmission length		-
Function		
Basic functions		Store and Forward Swich, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNTP, web customization, user accounts
Status and diagnostic indicators		LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port
Network expansion parameters		
Cascading depth		Network, linear, and star structure: any
Maximum conductor length (twisted pair)		100 m
Power supply		
Supply voltage		24 V DC (redundant)
Residual ripple		3.6 V_{PP}
Supply voltage range		12 V DC ... 48 V DC
Typical current consumption		312 mA (24 V DC)
General data		
Dimensions	W / H / D	78.6 mm / 145 mm / 125 mm
Degree of protection		IP20
Ambient temperature (operation)		-40 °C ... 70 °C
Permissible humidity (operation)		5 % ... 95 % (non-condensing)
Noise emission		EN 61000-6-4
Noise immunity		IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Managed switch - 16 RJ45 ports - 12 RJ45 ports, 2 SC FO ports - 12 RJ45 and 2 SFP FO ports	**FL SWITCH 3016E**	2891066	1

Accessories

Redundancy module - 3 RJ45 ports - 1 RJ45 port, 2 LC fiber optic ports (multi-mode)	**FL RED 2003E PRP** **FL RED 2001E PRP 2LC**	2701863 2701864	1 1
SFP module			

new

12 RJ45 ports and 2 fiber optic ports (multi-mode)

new

12 RJ45 ports and 2 fiber optic ports (single-mode)

Ethernet

IEC 61850-3

12 RJ45 ports and 2 SFP ports

Technical data

12 (RJ45 ports)	
10/100 Mbps (with auto negotiation)	
2 (SC multi-mode)	
100 Mbps (full duplex)	
1300/1310 nm	
8 km	
Store and Forward Swich, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNTP, web customization, user accounts	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
Network, linear, and star structure: any	
100 m	
24 V DC (redundant)	
3.6 V_{PP}	
12 V DC ... 48 V DC	
354 mA (at U_S = 24 V DC)	
78.6 mm / 145 mm / 125 mm	
IP20	
-40 °C ... 70 °C	
5 % ... 95 % (non-condensing)	
EN 61000-6-4	
IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 3012E-2FX	2891120	1

Accessories

FL RED 2003E PRP	2701863	1
FL RED 2001E PRP 2LC	2701864	1

Technical data

12 (RJ45 ports)	
10/100 Mbps (with auto negotiation)	
2 (SC single-mode)	
100 Mbps (full duplex)	
1300/1310 nm	
40 km	
Store and Forward Swich, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNTP, web customization, user accounts	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
Network, linear, and star structure: any	
100 m	
24 V DC (redundant)	
3.6 V_{PP}	
12 V DC ... 48 V DC	
320 mA (at U_S = 24 V DC)	
78.6 mm / 145 mm / 125 mm	
IP20	
-40 °C ... 70 °C	
5 % ... 95 % (non-condensing)	
EN 61000-6-4	
IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 3012E-2FX SM	2891119	1

Accessories

FL RED 2003E PRP	2701863	1
FL RED 2001E PRP 2LC	2701864	1

Technical data

12 (RJ45 ports)	
10/100 Mbps (with auto negotiation)	
2 (SFP ports)	
100 Mbps (full duplex)	
-	
-	
Store and Forward Swich, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNTP, web customization, user accounts	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
Network, linear, and star structure: any	
100 m	
24 V DC (redundant)	
3.6 V_{PP}	
12 V DC ... 48 V DC	
312 mA (at U_S = 24 V DC)	
78.6 mm / 145 mm / 125 mm	
IP20	
-40 °C ... 70 °C	
5 % ... 95 % (non-condensing)	
EN 61000-6-4	
IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 3012E-2SFX	2891067	1

Accessories

FL RED 2003E PRP	2701863	1
FL RED 2001E PRP 2LC	2701864	1

See page 424

Managed Switches, 19" rack-mount

The FL SWITCH 4800E line of substation hardened, Managed Switches combine 24 ports of 10/100 Mbps device connections with four 10/100/1000 Mbps uplink ports for a total of 28 ports. Application flexibility is assured with different mixes of copper/fiber and fiber types, gigabit fiber/copper "combination" ports and modular power supplies. Operation in extreme environments is assured with a wide temperature range and an electrical noise immunity up to four times that of normal industrial switches.

Features:

- All switches have four Gigabit combo ports for network connections with high data throughput
- Flexible cabling using eight or 24 10/100 Mbps RJ45 connections with up to 16 fiber (100 Mbps) fiber connections
- Extended Ring Redundancy provides a 15 ms recovery time
- Optional PRP redundancy modules provide 0 ms recovery times
- Extensive IEEE and security functions
- Unique web customization, diagnostic viewing mode, and help pages simplify maintenance
- Supports up to two modular, hot-swappable power supplies for maximum power flexibility and uptime
- Electrical noise immunity per IEC 61850-3 and IEEE 1613
- Extended temperature range (-40 °C ... +70 °C)

Notes:

[1]) Requires the installation of at least one FL SWITCH 4800E-P1 or FL SWITCH 4800E-P5 for operation.

Ethernet

IEC 61850-3

24 RJ45 ports and 4 gigabit combo (SFP or RJ45) ports

Technical data

Ethernet interface		
Number of ports		24 (RJ45 ports)
Transmission speed		10/100 Mbps
Ethernet (RJ45/FO combo)		
Interface		Ethernet (RJ45/FO combo)
Connection method		Combo
Note on connection method		Auto negotiation and autocrossing (RJ45 interface)
Fiber optic interface		
Number of ports		-
Transmission speed		-
Connection method		-
Transmission length		-
Function		
Basic functions		Store and Forward Swich, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNTP, web customization, user accounts
Status and diagnostic indicators		LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port
Network expansion parameters		
Cascading depth		Network, linear, and star structure: any
Maximum conductor length (twisted pair)		100 m
Power supply		
Power supply connection		From FL SWITCH 4800E-P...
General data		
Dimensions	W / H / D	442 mm / 44 mm / 375 mm
Degree of protection		IP20
Ambient temperature (operation)		-40 °C ... 70 °C
Permissible humidity (operation)		5 % ... 95 % (non-condensing)
Noise emission		EN 61000-6-4
Noise immunity		IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Managed switch, 19-inch rack mounted - 24 RJ45 and 4 gigabit combo ports	**FL SWITCH 4824E-4GC[1])**	2891072	1
Managed switch, 19-inch rack mounted with 8 RJ45 and 4 gigabit combo ports - 16 fiber optic (LC duplex) ports - 16 fiber optic (SC duplex) ports - 16 fiber optic (ST duplex) ports			
Managed switch, 19-inch rack mounted with 4 gigabit combo ports - 24 fiber optic (SC duplex) ports, multi-mode - 24 fiber optic (SC duplex) ports, single-mode			

Accessories

Power supply, modular redundant - 48 V DC nominal	**FL SWITCH 4800E-P1**	2891075	1
- 230 V nominal	**FL SWITCH 4800E-P5**	2891076	1
Redundancy module - 3 RJ45 ports	**FL RED 2003E PRP**	2701863	1
- 1 RJ45 port, 2 LC fiber optic ports (multi-mode)	**FL RED 2001E PRP 2LC**	2701864	1

SFP module — **See page 424**

new

Ethernet

IEC 61850-3

**8 RJ45 ports,
4 gigabit combo (SFP or RJ45) ports
and 16 FO ports (multi-mode)**

Technical data

8 (RJ45 ports)	
10/100 Mbps	
Ethernet (RJ45/FO combo)	
Combo	
Auto negotiation and autocrossing (RJ45 interface)	
16 (Multi mode)	
100 Mbps (Full duplex)	
LC	
8 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	
Store and Forward Swich, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNTP, web customization, user accounts	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
Network, linear, and star structure: any	
100 m	
From FL SWITCH 4800E-P...	
442 mm / 44 mm / 375 mm	
IP20	
-40 °C ... 70 °C	
5 % ... 95 % (non-condensing)	
EN 61000-6-4	
IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 4808E-16FX LC-4GC[1])	**2891073**	1
FL SWITCH 4808E-16FX-4GC[1])	**2891079**	1
FL SWITCH 4808E-16FX ST-4GC	**2891085**	1

Accessories

FL SWITCH 4800E-P1	**2891075**	1
FL SWITCH 4800E-P5	**2891076**	1
FL RED 2003E PRP	**2701863**	1
FL RED 2001E PRP 2LC	**2701864**	1

See page 424

Ethernet

IEC 61850-3

**8 RJ45 ports,
4 gigabit combo (SFP or RJ45) ports
and 16 FO ports (single-mode)**

Technical data

8 (RJ45 ports)	
10/100 Mbps	
Ethernet (RJ45/FO combo)	
Combo	
Auto negotiation and autocrossing (RJ45 interface)	
16 (single-mode)	
100 Mbps (Full duplex)	
LC	
40 km (typical)	
Store and Forward Swich, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNTP, web customization, user accounts	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
Network, linear, and star structure: any	
100 m	
From FL SWITCH 4800E-P...	
442 mm / 44 mm / 375 mm	
IP20	
-40 °C ... 70 °C	
5 % ... 95 % (non-condensing)	
EN 61000-6-4	
IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005	
Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 4808E-16FX SM LC-4GC[1])	**2891074**	1
FL SWITCH 4808E-16FX SM-4GC[1])	**2891080**	1
FL SWITCH 4808E-16FX SM ST-4GC	**2891086**	1

Accessories

FL SWITCH 4800E-P1	**2891075**	1
FL SWITCH 4800E-P5	**2891076**	1
FL RED 2003E PRP	**2701863**	1
FL RED 2001E PRP 2LC	**2701864**	1

See page 424

Ethernet

IEC 61850-3

**4 gigabit combo (SFP or RJ45) ports
and 24 FO ports**

Technical data

	FL SWITCH 4800E-24FX-4GC	FL SWITCH 4800E-24FX SM-4GC
8 (RJ45 ports)	-	
10/100 Mbps	-	
Ethernet (RJ45/FO combo)		
Combo		
Auto negotiation and autocrossing (RJ45 interface)		
24 (Multi mode)		24 (single-mode)
100 Mbps (Full duplex)		
SC		
8 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)		40 km (typical)
Store and Forward Swich, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNTP, web customization, user accounts		
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port		
Network, linear, and star structure: any		
100 m		
From FL SWITCH 4800E-P...		
442 mm / 44 mm / 375 mm		
IP20		
-40 °C ... 70 °C		
5 % ... 95 % (non-condensing)		
EN 61000-6-4		
IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005		
Class A product, see page 525		

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 4800E-24FX-4GC	**2891102**	1
FL SWITCH 4800E-24FX SM-4GC	**2891104**	1

Accessories

FL SWITCH 4800E-P1	**2891075**	1
FL SWITCH 4800E-P5	**2891076**	1
FL RED 2003E PRP	**2701863**	1
FL RED 2001E PRP 2LC	**2701864**	1

See page 424

Redundancy modules

Energy networks rely on particularly high fault tolerance. The new PRP redundancy modules enable parallel redundancy without switch-over time in the event of a fault. You can therefore ensure maximum availability of your network.

Interruption-free communication

– The FL RED 2000E redundancy module is equipped with the Parallel Redundancy Protocol (PRP)
– Interoperability in high-availability networks is possible, as required in the energy sector
– The system continues to operate in the case of redundancy without switch-over time

Robust design

– Developed according to the requirements of IEC 61850-3 and IEEE 1613: complies with the high requirements for network technology in this area
– Robust to withstand voltage fluctuations due to a wide input voltage range of 18 V DC ... 58 V DC
– Robust metal housing
– Extended temperature range (-40 °C ... +70 °C)

Easy handling

– Design of a high-availability network without configuration
– LED indicators provide on-site information regarding the status of the network and redundancy
– Alarm signal contact indicates the status of the module and network

Ethernet

IEC 61850-3

Technical data

		FL RED 2003E PRP	FL RED 2001E PRP 2LC
Ethernet interface			
Number of ports		3 (RJ45 ports)	1 (RJ45 port)
Transmission speed		10/100 Mbps	
Transmission length		100 m (per segment)	
Fiber optic interface			
Interface		-	Ethernet FO
Number of ports		-	2 (LC multi-mode)
Transmission speed		-	100 Mbps (full duplex)
Connection method		-	LC
Transmission length		-	2 km (per segment)
Function			
Basic functions		Ethernet redundancy module for the Parallel Redundancy Protocol	
Status and diagnostic indicators		LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
Power supply			
Supply voltage		24 V DC (redundant) 48 V DC (redundant)	
Residual ripple		3.6 V_{PP}	
Supply voltage range		18 V DC ... 58 V DC	
Typical current consumption		250 mA (at U_S = 24 V DC)	
General data			
Dimensions	W / H / D	40 mm / 100 mm / 109 mm	
Degree of protection		IP20	
Ambient temperature (operation)		-40 °C ... 70 °C	
Permissible humidity (operation)		10 % ... 95 % (non-condensing)	
Noise emission		EN 61000-6-4	
Noise immunity		IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005	
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Redundancy module			
- 3 RJ45 ports	**FL RED 2003E PRP**	2701863	1
- 1 RJ45 port, 2 LC fiber optic ports (multi-mode)	**FL RED 2001E PRP 2LC**	2701864	1

Unmanaged Switches

The **FL SWITCH 1008E** industrial Unmanaged Switch is designed for use in energy technology. With its robust design, it can be used in environments subject to high levels of EMI around switchgear that have been designed according to the new IEC 61850 standard.

Features:

- 8 RJ45 ports in metal housing with DIN rail adapter
- Extended temperature range for harsh environments (-40°C ... +75°C)
- Redundant power supply with a wide range from 12 ... 57 V DC (24, 36, 48 V DC)
- Robust design for high EMC requirements, such as electrostatic discharge with 15 kV air discharge and 8 kV contact discharge; surge withstand capability (surge) and fast transients (burst) up to 4 kV
- Floating alarm contact for power supply monitoring and diagnostics
- Link monitoring of every port for diagnostics via alarm LED and alarm contact can be configured via DIP switches

Notes:

A media converter which meets the same requirements that are required for switchgear and transformer substations in energy technology can be found on page 339

Ethernet

IEC 61850-3

8 RJ45 ports

Technical data

Ethernet interface		
Number of ports		8 (RJ45 ports)
Transmission speed		10/100 Mbps
Connection method		RJ45
Function		
Basic functions		Unmanaged Switch / autonegotiation, complies with IEEE 802.3, Store and Forward Swiching mode, includes QoS and alarm contact. Meets IEC 61850-3 and IEEE 1613 standards
Status and diagnostic indicators		LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port
Network expansion parameters		
Cascading depth		Network, linear, and star structure: any
Maximum conductor length (twisted pair)		100 m
Power supply		
Supply voltage		24 V DC (redundant) 48 V DC
Residual ripple		3.6 V_{PP}
Supply voltage range		12 V DC ... 57 V DC
Typical current consumption		440 mA (at U_S = 24 V DC)
General data		
Dimensions	W / H / D	54.4 mm / 146.4 mm / 125 mm
Degree of protection		IP20
Ambient temperature (operation)		-40 °C ... 75 °C
Permissible humidity (operation)		5 % ... 95 % (non-condensing)
Noise emission		EN 61000-6-4
Noise immunity		IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet switch - 8 RJ45 ports	**FL SWITCH 1008E**	2891065	1

Security routers for DIN rails

The compact and fanless DIN rail devices in metal housing suitable for industrial applications have an SD card slot at the front for configuration memory. The SD cards can be used for starting up or replacing the devices quickly and easily.

The devices feature an extended temperature range and contain a buffered realtime clock and trusted platform module (TPM) for secure and reliable key generation and management.

The FL MGUARD RS4000 ... devices provide high-availability high-end security for industry and a remote maintenance infrastructure for the secure and reliable connection of machines and systems.

The FL MGUARD RS2000 ... devices are designed for price-sensitive applications with fewer complex requirements and allow secure and reliable remote maintenance of machines and systems in the field via the Internet. In this context, they are used as industrial remote service routers with a simplified configuration.

Secure networks also with Gigabit

The new router generation for top-class security:

– Replaceable configuration memory
– Comprehensive connection options
– flexible routing
– Intelligent stateful inspection firewall
– Secure remote services (VPN) according to IPsec standard or as OpenVPN client
– Central management tool available

VPN licenses

Operation with up to 250 parallel VPN tunnels is possible with optional VPN licenses.

Notes:

Central device management software, the Device Manager for FL MGUARD devices, can be found on page 441

Router for standard routing

Technical data

Ethernet interface		
Number of ports		2 (RJ45 ports)
Transmission speed		10/100 Mbps
Function		
Basic functions		Router for standard routing, NAT, 1:1-NAT and port forwarding
SNMP – Simple Network Management Protocol		SNMPv1, v2, v3
Security functions		
VPN throughput		-
Number of VPN tunnels		-
Encryption methods		-
Internet Protocol Security (IPsec) mode		-
Authentication		-
Data integrity		-
Firewall data throughput		-
Firewall rules		-
Filtering		-
Protection against		IP spoofing
Routing		Standard routing, NAT, 1:1-NAT, port forwarding
Power supply		
Supply voltage		24 V DC
Typical current consumption		100 mA (at U_S = 24 V DC)
General data		
Dimensions	W / H / D	45 mm / 130 mm / 114 mm
Ambient temperature (operation)		-20 °C ... 60 °C
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Router/firewall - Without VPN - With VPN	**FL MGUARD RS2000 TX/TX-B**	2702139	1

Accessories

Program and configuration memory, plug-in	**SD FLASH 512MB**	2988146	1
License for **lifetime software update** of FL MGUARD field devices	**FL MGUARD LIC LIFETIME FW**	2700184	1
License for activating CIFS Integrity Monitoring (CIM) on FL MGUARD			
License for activating the OPC inspector function on an FL MGUARD			
License for activating the firewall/router redundancy function on an FL MGUARD device pair			
License for activating the firewall/router and VPN redundancy function on an FL MGUARD device pair			

Router with simplified 2-click firewall and VPN

Router with intelligent firewall and VPN

Gigabit router with firewall, replaceable memory

Ex:

Ex:

Technical data

2 (RJ45 ports) 10/100 Mbps	
Router with simplified 2-click firewall and VPN for 2 tunnels (fixed), metal housing, slot for any SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps/40 Mbps	
SNMPv1, v2, v3	
max. 40 Mbps (Router mode, VPN bidirectional throughput)	
2 (Fixed, Ipsec (IETF standard))	
DES, 3DES, AES-128, -192, -256 ESP tunnel / ESP transport X.509v3 certificates with RSA or PSK	
MD5, SHA-1 max. 124 Mbps (Router mode, default firewall rules, bidirectional throughput) Simplified 2-click stateful inspection firewall	
Incoming or outgoing traffic - Standard routing, NAT, 1:1-NAT, port forwarding	
24 V DC 100 mA (at U_S = 24 V DC)	
45 mm / 130 mm / 114 mm -20 °C ... 60 °C Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGUARD RS2000 TX/TX VPN	2700642	1

Accessories

SD FLASH 512MB	2988146	1
FL MGUARD LIC LIFETIME FW	2700184	1

Technical data

FL MGUARD RS4000 TX/TX	FL MGUARD RS4000 TX/TX VPN
2 (RJ45 ports) 10/100 Mbps	
Router with intelligent firewall (VPN, 10 tunnels as an option, up to 250 with additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN (as an option): up to 124 Mbps/40 Mbps (as an option)	Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps/40 Mbps
SNMPv1, v2, v3	
max. 40 Mbps (Router mode, VPN bidirectional throughput)	
0 (up to 250 tunnels with additional license as an option)	10 (up to 250 tunnels with additional license as an option)
DES, 3DES, AES-128, -192, -256 ESP tunnel / ESP transport X.509v3 certificates with RSA or PSK	
MD5, SHA-1 max. 124 Mbps (Router mode, default firewall rules, bidirectional throughput) Configurable stateful inspection firewall with full scope of functions	
MAC and IP addresses, ports, protocols IP spoofing, DoS and Syn Flood Protection Standard routing, NAT, 1:1-NAT, port forwarding	
24 V DC (redundant) 100 mA (at U_S = 24 V DC)	
45 mm / 130 mm / 114 mm -20 °C ... 60 °C Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGUARD RS4000 TX/TX	2700634	1
FL MGUARD RS4000 TX/TX VPN	2200515	1

Accessories

SD FLASH 512MB	2988146	1
FL MGUARD LIC LIFETIME FW	2700184	1
FL MGUARD LIC CIM	2701083	1
FL MGUARD LIC OPC INSP	2702191	1
FL MGUARD LIC FW RD	2701356	1
FL MGUARD LIC FW/VPN RD	2702193	1

Technical data

FL MGUARD GT/GT	FL MGUARD GT/GT VPN
2 (Combo ports) 10/100/1000 Mbps (SFP module: 100/1000 Mbps)	
Router with intelligent firewall and Gigabit connectivity	Router with intelligent firewall and Gigabit connectivity and VPN
SNMPv1, v2, v3	
max. 106 Mbps (Router mode, VPN bidirectional throughput)	
0 (up to 250 tunnels with additional license as an option)	10 (up to 250 tunnels with additional license as an option)
DES, 3DES, AES-128, -192, -256	
-	ESP tunnel / ESP transport
-	X.509v3 certificates with RSA or PSK
-	MD5, SHA-1
max. 417 Mbps (Router mode, default firewall rules, bidirectional throughput) Configurable stateful inspection firewall	
MAC and IP addresses, ports, protocols IP spoofing, DoS and Syn Flood Protection Standard routing, NAT, 1:1-NAT, port forwarding	
24 V DC (redundant) 270 mA (at U_S = 24 V DC)	
128 mm / 110 mm / 69 mm -20 °C ... 60 °C Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGUARD GT/GT	2700197	1
FL MGUARD GT/GT VPN	2700198	1

Accessories

FL MEM PLUG	2891259	1
FL MGUARD LIC LIFETIME FW	2700184	1
FL MGUARD LIC CIM	2701083	1
FL MGUARD LIC OPC INSP	2702191	1
FL MGUARD LIC FW RD	2701356	1
FL MGUARD LIC FW/VPN RD	2702193	1

Security routers for DIN rails

The compact, fanless security routers with 5 unmanaged ports or 4 managed ports and DMZ port for mutual protection of several networks are equipped with the simplified 2-click firewall or intelligent firewall with full functionality and easy configuration.

The devices have an SD card slot at the front for configuration memory. The SD cards can be used for starting up or replacing the devices quickly and easily.

The devices feature an extended temperature range and contain a buffered realtime clock and trusted platform module (TPM) for secure and reliable key generation and management.

VPN licenses

Operation with up to 250 parallel VPN tunnels is possible with optional VPN licenses.

Notes:

Central device management software, the Device Manager for FL MGUARD devices, can be found on page 441

Router with simplified 2-click firewall, VPN, and integrated switch

Technical data

Ethernet interface		
Number of ports		6 (RJ45 ports)
Transmission speed		10/100 Mbps
Function		
Basic functions		Router with simplified firewall and VPN for 2 tunnels, integrated 5-port switch, metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps/ 40 Mbps
SNMP – Simple Network Management Protocol		SNMPv1, v2, v3
Security functions		
VPN throughput		max. 42 Mbps (Router)
Number of VPN tunnels		2
Encryption methods		DES, 3DES, AES-128, -192, -256
Internet Protocol Security (IPsec) mode		ESP tunnel / ESP transport
Authentication		X.509v3 certificates with RSA or PSK
Data integrity		MD5, SHA-1
Firewall data throughput		max. 130 Mbps (Router mode, default firewall rules, bidirectional throughput)
Firewall rules		Can be switched on/off
Filtering		-
Protection against		-
Routing		-
Power supply		
Supply voltage		24 V DC (redundant)
Typical current consumption		100 mA (at U_S = 24 V DC)
General data		
Dimensions	W / H / D	45 mm / 130 mm / 114 mm
Ambient temperature (operation)		-20 °C ... 60 °C
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Router/firewall - Without VPN - With VPN	**FL MGUARD RS2005 TX VPN**	2701875	1

Accessories

Program and configuration memory, plug-in	**SD FLASH 512MB**	2988146	1
License for **lifetime software update** of FL MGUARD field devices	**FL MGUARD LIC LIFETIME FW**	2700184	1
License for activating CIFS Integrity Monitoring (CIM) on FL MGUARD			
License for activating the OPC inspector function on an FL MGUARD			
License for activating the firewall/router redundancy function on an FL MGUARD device pair			
License for activating the firewall/router and VPN redundancy function on an FL MGUARD device pair			

new

Router with intelligent firewall and integrated switch

Router with intelligent firewall, VPN, and integrated switch

Router with intelligent firewall, with VPN as an option

Technical data

6 (RJ45 ports) 10/100 Mbps	
Router with intelligent firewall, integrated 4-port managed switch, opt. VPN (opt. for 10 tunnels, up 1to 250 tunnels with additional license), CIFS Integrity Monitoring (opt.), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps / 40 Mbps	
SNMPv1, v2, v3	
max. 42 Mbps (Router)	
-	
DES, 3DES, AES-128, -192, -256 - - -	
max. 130 Mbps (Router mode, default firewall rules, bidirectional throughput) Configurable stateful inspection firewall with full scope of functions MAC and IP addresses, ports, protocols IP spoofing, DoS and Syn Flood Protection Standard routing, NAT, 1:1-NAT, port forwarding	
24 V DC (redundant) 100 mA (at U_S = 24 V DC)	
45 mm / 130 mm / 114 mm -20 °C ... 60 °C Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGUARD RS4004 TX/DTX	2701876	1

Accessories

SD FLASH 512MB	2988146	1
FL MGUARD LIC LIFETIME FW	2700184	1
FL MGUARD LIC CIM	2701083	1
FL MGUARD LIC OPC INSP	2702191	1
FL MGUARD LIC FW RD	2701356	1
FL MGUARD LIC FW/VPN RD	2702193	1

Technical data

6 (RJ45 ports) 10/100 Mbps	
Router with intelligent firewall, integrated 4-port managed switch and VPN for 10 tunnels (opt. up to 250 with additional license), CIFS Integrity Monitoring (opt.), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps / 40 Mbps	
SNMPv1, v2, v3	
max. 42 Mbps (Router)	
10 (up to 250 tunnels with additional license as an option)	
DES, 3DES, AES-128, -192, -256 ESP tunnel / ESP transport X.509v3 certificates with RSA or PSK MD5, SHA-1	
max. 130 Mbps (Router mode, default firewall rules, bidirectional throughput) Configurable stateful inspection firewall with full scope of functions MAC and IP addresses, ports, protocols IP spoofing, DoS and Syn Flood Protection Standard routing, NAT, 1:1-NAT, port forwarding	
24 V DC (redundant) 100 mA (at U_S = 24 V DC)	
45 mm / 130 mm / 114 mm -20 °C ... 60 °C Class A product, see page 525	

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGUARD RS4004 TX/DTX VPN	2701877	1

Accessories

SD FLASH 512MB	2988146	1
FL MGUARD LIC LIFETIME FW	2700184	1
FL MGUARD LIC CIM	2701083	1
FL MGUARD LIC OPC INSP	2702191	1
FL MGUARD LIC FW RD	2701356	1
FL MGUARD LIC FW/VPN RD	2702193	1

Technical data

FL MGUARD DELTA TX/TX VPN	FL MGUARD DELTA TX/TX
2 (RJ45) 10/100 Mbps	
Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card	Router with intelligent firewall (VPN, 10 tunnels as an option, up to 250 possible with additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN (as an option): up to 99 Mbps / 35 Mbps (as an option)
SNMPv1, v2, v3	
max. 42 Mbps (Router mode, VPN bidirectional throughput)	
As an option, 10 tunnels up to 250 tunnels, Ipsec (IETF) standard with additional license FL MGUARD LIC VPN-10/ Order No. 2700194 or FL MGUARD LIC VPN-250/ Order No. 2700193 or 2700192.	
DES, 3DES, AES-128, -192, -256 - - -	
max. 130 Mbps (Router mode, default firewall rules, bidirectional throughput) Configurable stateful inspection firewall with full scope of functions MAC and IP addresses, ports, protocols IP spoofing, DoS and Syn Flood Protection Standard routing, NAT, 1:1-NAT, port forwarding	
230 V AC 13 mA	
130 mm / 50 mm / 114 mm 5 °C ... 40 °C	

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGUARD DELTA TX/TX	2700967	1
FL MGUARD DELTA TX/TX VPN	2700968	1

Accessories

SD FLASH 512MB	2988146	1
FL MGUARD LIC LIFETIME FW	2700184	1
FL MGUARD LIC CIM	2701083	1
FL MGUARD LIC OPC INSP	2702191	1
FL MGUARD LIC FW RD	2701356	1
FL MGUARD LIC FW/VPN RD	2702193	1

Security appliances for special applications

The FL MGUARD...-M features all applicable maritime approvals and is therefore the ideal device for onshore and offshore applications.

The FL MGUARD...-P is the process technology specialist. In addition to conformal coating, the device features ATEX and IECEx approvals as well as a particularly wide temperature range. The DPI (Deep Packet Inspection) function for OPC Classic and Modbus/TCP turns the device into an application layer firewall.

The FL MGUARD CENTERPORT provides more than enough performance for large remote maintenance centers or for use as an extremely high-performance firewall. For increased availability, the device has two separate power supplies. With the optional redundancy licenses you can turn the device into a high-availability solution.

Notes:

Central device management software, the Device Manager for FL MGUARD devices, can be found on page 441

new

With maritime approvals

DNV GL

Technical data

Ethernet interface		
Number of ports		2 (RJ45 ports)
Transmission speed		10/100 Mbps
Function		
Basic functions		Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps/40 Mbps
SNMP – Simple Network Management Protocol		SNMPv1, v2, v3
Security functions		
VPN throughput		max. 40 Mbps (Router mode, VPN bidirectional throughput)
Number of VPN tunnels		10 (up to 250 tunnels with additional license as an option)
Encryption methods		DES, 3DES, AES-128, -192, -256
Internet Protocol Security (IPsec) mode		ESP tunnel / ESP transport
Authentication		X.509v3 certificates with RSA or PSK
Data integrity		MD5, SHA-1
Firewall data throughput		max. 124 Mbps (Router mode, default firewall rules, bidirectional throughput)
Firewall rules		Configurable stateful inspection firewall with full scope of functions
Filtering		MAC and IP addresses, ports, protocols
Protection against		IP spoofing, DoS and Syn Flood Protection
Routing		Standard routing, NAT, 1:1-NAT, port forwarding
Power supply		
Supply voltage		24 V DC (redundant)
Supply voltage range		9 V DC ... 36 V DC
Typical current consumption		100 mA (at U_S = 24 V DC)
General data		
Dimensions	W / H / D	45 mm / 130 mm / 114 mm
Ambient temperature (operation)		-40 °C ... 70 °C
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Security appliance, for special applications			
	FL MGUARD RS4000 TX/TX VPN-M	2702465	1

Accessories

Program and configuration memory, plug-in	**SD FLASH 512MB**	2988146	1
License for **lifetime software update** of FL MGUARD field devices	**FL MGUARD LIC LIFETIME FW**	2700184	1
License for activating CIFS Integrity Monitoring (CIM) on FL MGUARD	**FL MGUARD LIC CIM**	2701083	1
License for activating the OPC inspector function on an FL MGUARD	**FL MGUARD LIC OPC INSP**	2702191	1
License for activating the firewall/router redundancy function on an FL MGUARD device pair	**FL MGUARD LIC FW RD**	2701356	1
License for activating the firewall/router and VPN redundancy function on an FL MGUARD device pair			

new

For process technical applications

new

High performance with high availability

Ex:

Technical data	
2 (RJ45 ports) 10/100 Mbps	4 (RJ45 ports) 10/100/1000 Mbps
Router with intelligent firewall and OPC inspector with ATEX and IECEx approval (VPN for up to 250 tunnels with additional license as an option), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps/40 Mbps	Security appliance for up to 3000 parallel VPN tunnels (with additional licenses) and more than 600 Mbps VPN data throughput (with hardware encryption)
SNMPv1, v2, v3	SNMPv1, v2, v3
max. 40 Mbps (Router mode, VPN bidirectional throughput)	600 Mbps (Router mode, VPN bidirectional throughput)
0 (up to 250 tunnels with additional license as an option)	0 (In the best case, up to 3000 tunnels with additional licenses)
DES, 3DES, AES-128, -192, -256 ESP tunnel / ESP transport X.509v3 certificates with RSA or PSK MD5, SHA-1 max. 124 Mbps (Router mode, default firewall rules, bidirectional throughput) Configurable stateful inspection firewall with full scope of functions, deep packet inspection for OPC classic	DES, 3DES, AES-128, -192, -256 ESP tunnel / ESP transport X.509v3 certificates with RSA or PSK MD5, SHA-1 2000 Mbps (Router mode, default firewall rules, bidirectional throughput) Configurable stateful inspection firewall with full scope of functions
MAC and IP addresses, ports, protocols IP spoofing, DoS and Syn Flood Protection Standard routing, NAT, 1:1-NAT, port forwarding	MAC and IP addresses, ports, protocols IP spoofing, DoS and Syn Flood Protection Standard routing, NAT, 1:1-NAT, port forwarding
24 V DC (redundant) 9 V DC ... 36 V DC 100 mA (at U_S = 24 V DC)	- 2x 100 V AC ... 240 V AC (redundant) -
45 mm / 130 mm / 114 mm -40 °C ... 70 °C Class A product, see page 525	447 mm / 44 mm / 458 mm 0 °C ... 45 °C

Ordering data		
Type	**Order No.**	Pcs./Pkt.
FL MGUARD RS4000 TX/TX-P	**2702259**	1
Accessories		
SD FLASH 512MB	**2988146**	1
FL MGUARD LIC LIFETIME FW	**2700184**	1
FL MGUARD LIC CIM	**2701083**	1
FL MGUARD LIC OPC INSP	**2702191**	1
FL MGUARD LIC FW RD	**2701356**	1
FL MGUARD LIC FW/VPN RD	**2702193**	1

Ordering data		
Type	**Order No.**	Pcs./Pkt.
FL MGUARD CENTERPORT	**2702547**	1
Accessories		
SD FLASH 512MB	**2988146**	1
FL MGUARD LIC LIFETIME FW	**2700184**	1
FL MGUARD LIC CIM	**2701083**	1
FL MGUARD LIC OPC INSP	**2702191**	1
FL MGUARD LIC FW RD	**2701356**	1
FL MGUARD LIC FW/VPN RD	**2702193**	1

Firewall/router for office-based/mobile use

The FL MGUARD SMART2 features maximum possible security and performance in a minimum amount of space.

With its robust housing and uncomplicated power supply via any USB port, the FL MGUARD SMART2 is the ideal solution for the mobile protection of critical company resources.

The device is particularly suitable for the mobile and stationary protection of workstations and environments close to the production process with low requirements for industrial hardening.

It can be used as a secure firewall between office and production networks, as a remote maintenance client or as a security router for small workgroups.

Security routers without DIN rail mounting

Security is fundamental for PC-based automation. Do not leave any room for attack.

Distributed protection concepts where automation cells are protected individually provide maximum security.

In order to protect your PC reliably and easily in the network, PCI bus-based **FL MGUARD PCI** cards are the ideal choice. mGuard technology features:

– Maximum security
– Optimum performance
– Central management

VPN licenses

Operation with up to 250 parallel VPN tunnels is possible with optional VPN licenses.

Notes:

Central device management software, the Device Manager for FL MGUARD devices, can be found on page 441

Router with firewall for mobile use

EAC

Technical data

	FL MGUARD SMART2 VPN	FL MGUARD SMART2
Ethernet interface		
Number of ports	2 (RJ45)	
Transmission speed	10/100 Mbps	
Function		
Basic functions	Firewall/router for office use or mobile service technicians	
SNMP – Simple Network Management Protocol	SNMPv1, v2, v3	
Security functions		
Dynamic Host Configuration Protocol (DHCP) support	Server or Relay Agent	
Remote syslog logging	On external server	
VPN throughput	max. 42 Mbps (Router mode, VPN bidirectional throughput)	
Number of VPN tunnels	10 (Up to 250 with license possible)	0 (up to 250 tunnels with additional license as an option)
Encryption methods	DES, 3DES, AES-128, -192, -256	
Internet Protocol Security (IPsec) mode	ESP tunnel / ESP transport	-
Authentication	X.509v3 certificates with RSA or PSK	-
Data integrity	MD5, SHA-1	-
1:1 Network Address Translation (NAT) in the VPN	Supported	-
Firewall data throughput	max. 130 Mbps (Router mode, default firewall rules, bidirectional throughput)	
Firewall rules	Configurable stateful inspection firewall	
Filtering	MAC and IP addresses, ports, protocols	
Protection against	IP spoofing, DoS and Syn Flood Protection	
Routing	NAT, 1:1-NAT, Port Forwarding	
Power supply		
Supply voltage	5 V DC (from USB interface)	
General data		
Width	77 mm	
Degree of protection	IP30	
Ambient temperature (operation)	0 °C ... 40 °C	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Router with firewall			
- Without VPN	**FL MGUARD SMART2**	2700640	1
- With VPN	**FL MGUARD SMART2 VPN**	2700639	1

Accessories

Program and configuration memory, plug-in			
License for **lifetime software update** of FL MGUARD field devices	**FL MGUARD LIC LIFETIME FW**	2700184	1
License for activating CIFS Integrity Monitoring (CIM) on FL MGUARD	**FL MGUARD LIC CIM**	2701083	1
License for activating the OPC inspector function on an FL MGUARD	**FL MGUARD LIC OPC INSP**	2702191	1
License for activating the firewall/router redundancy function on an FL MGUARD device pair	**FL MGUARD LIC FW RD**	2701356	1
License for activating the firewall/router and VPN redundancy function on an FL MGUARD device pair	**FL MGUARD LIC FW/VPN RD**	2702193	1

new

Embedded router/firewall with VPN

Router with firewall for PCI, with VPN as an option

Router with firewall and VPN for PCIe

Technical data

1 (RJ45 port)	
10/100 Mbps	
Embedded router with intelligent firewall and VPN for 10 active tunnels	
SNMPv1, v2, v3	
Server or Relay Agent	
On external server	
max. 40 Mbps (Router mode, VPN bidirectional throughput)	
10 (up to 250 tunnels with additional license as an option)	
DES, 3DES, AES-128, -192, -256	
ESP tunnel / ESP transport	
X.509v3 certificates with RSA or PSK	
MD5, SHA-1	
Supported	
max. 124 Mbps (Router mode, default firewall rules, bidirectional throughput)	
Configurable stateful inspection firewall with full scope of functions	
MAC and IP addresses, ports, protocols	
IP spoofing, DoS and Syn Flood Protection	
Standard routing, NAT, 1:1-NAT, port forwarding	
5 V DC	
56 mm	
IP00	
0 °C ... 60 °C	

Technical data

FL MGUARD PCI4000 VPN	FL MGUARD PCI4000
2 (RJ45)	
10/100 Mbps	
Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps/40 Mbps	Router with intelligent firewall (VPN, 10 tunnels as an option, up to 250 with additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN (as an option): up to 124 Mbps/40 Mbps (as an option)
SNMPv1, v2, v3	
Server or Relay Agent	
On external server	
max. 42 Mbps (Router)	max. 42 Mbps (Router mode, VPN bidirectional throughput)
10 (up to 250 tunnels with additional license as an option)	0 (up to 250 tunnels with additional license as an option)
DES, 3DES, AES-128, -192, -256	
ESP tunnel / ESP transport	-
X.509v3 certificates with RSA or PSK	-
MD5, SHA-1	-
Supported	-
max. 130 Mbps (Router mode, default firewall rules, bidirectional throughput)	
Configurable stateful inspection firewall with full scope of functions	
MAC and IP addresses, ports, protocols	
IP spoofing, DoS and Syn Flood Protection	
Standard routing, NAT, 1:1-NAT, port forwarding	
-	
IP00	
0 °C ... 70 °C	

Technical data

2 (RJ45)
10/100 Mbps
Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps/40 Mbps
SNMPv1, v2, v3
Server or Relay Agent
On external server
max. 42 Mbps (Router)
10 (up to 250 tunnels with additional license as an option)
DES, 3DES, AES-128, -192, -256
ESP tunnel / ESP transport
X.509v3 certificates with RSA or PSK
MD5, SHA-1
Supported
max. 130 Mbps (Router mode, default firewall rules, bidirectional throughput)
Configurable stateful inspection firewall with full scope of functions
MAC and IP addresses, ports, protocols
IP spoofing, DoS and Syn Flood Protection
Standard routing, NAT, 1:1-NAT, port forwarding
-
-
IP00
0 °C ... 70 °C

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGUARD CORE TX VPN	**2702831**	1

Accessories

SD FLASH 512MB	**2988146**	1
FL MGUARD LIC LIFETIME FW	**2700184**	1
FL MGUARD LIC CIM	**2701083**	1
FL MGUARD LIC OPC INSP	**2702191**	1
FL MGUARD LIC FW RD	**2701356**	1
FL MGUARD LIC FW/VPN RD	**2702193**	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGUARD PCI4000	**2701274**	1
FL MGUARD PCI4000 VPN	**2701275**	1

Accessories

SD FLASH 512MB	**2988146**	1
FL MGUARD LIC LIFETIME FW	**2700184**	1
FL MGUARD LIC CIM	**2701083**	1
FL MGUARD LIC OPC INSP	**2702191**	1
FL MGUARD LIC FW RD	**2701356**	1
FL MGUARD LIC FW/VPN RD	**2702193**	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGUARD PCIE4000 VPN	**2701278**	1

Accessories

SD FLASH 512MB	**2988146**	1
FL MGUARD LIC LIFETIME FW	**2700184**	1
FL MGUARD LIC CIM	**2701083**	1
FL MGUARD LIC OPC INSP	**2702191**	1
FL MGUARD LIC FW RD	**2701356**	1
FL MGUARD LIC FW/VPN RD	**2702193**	1

Network diagnostics software

FL VIEW scans the Ethernet TCP/IP (PROFINET) network and automatically detects all the devices in the network and their connections. Using various display methods, IP addresses, devices or locations can be shown in the topology with the corresponding image files.

Features:
– Status display of network connections and network devices using different colors - you can identify a faulty device or an overloaded connection immediately
– Detection of the imminent failure of network components, e.g., through detection of the increasing ping error rate and its display

Device Manager for FL MGUARD devices

The Device Manager simplifies the management of FL MGUARD security appliances.

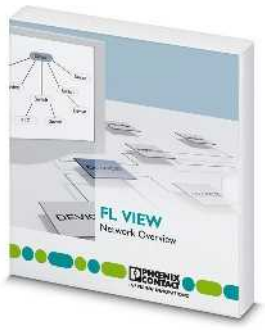
The tool features a template mechanism that enables the user to configure and manage all FL MGUARD devices centrally – from a few hundred devices to several thousand.

Features:
– Central configuration of several thousand appliances
– Template-based management tool
– Suitable for remote maintenance applications

FL Network Manager

This software simplifies the startup and configuration of the Factory Line network components and enables a multiple firmware update to be performed.

Features:
– Network scan for recording the devices
– IP address planning for the convenient rollout of IP addresses
– Multi device firmware update



Network monitoring and diagnostics

Technical data

Hardware requirements	
Processor	> 1 GHz
Main memory (RAM)	512 Mbyte
Hard disk memory	min. 150 Mbyte (For help and video files, an additional 650 MB is needed)
Optical drive	CD-ROM
Interfaces	Ethernet Port
Software requirements	
Operating systems	Windows XP SP3 (32-bit) WIndows 7 Windows® Server 2008 Windows® Server 2003
Basic functions	FL VIEW is a software product for detecting and monitoring industrial Ethernet TCP/IP networks with advanced features for PROFINET applications. FL VIEW automatically detects the topology and status of the networks and devices and transmits this in an animated realtime graphic.
Languages supported	English

Ordering data

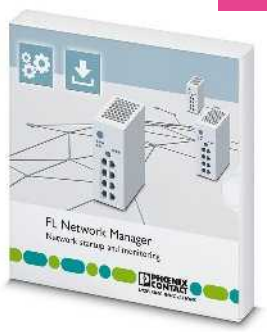
Description	Type	Order No.	Pcs./Pkt.
Network monitoring software, for 32 nodes in one subnetwork	**FL VIEW 32 LITE**	2701744	1
Network monitoring software, for nodes in different subnetworks			
- For 64 nodes	**FL VIEW 64**	2701472	1
- For 256 nodes	**FL VIEW 256**	2701473	1
- For 512 nodes	**FL VIEW 512**	2701474	1
Central **device management software** for FL MGUARD devices, for installation on a PC. Additional FL MGUARD PROF SERVICE2 service required. - For 100 devices in the field - For any number of devices in the field			
Network management software			

Accessories

Device Manager software update, for both FL MGUARD DM 100 and FL MGUARD DM UNLIMITED.			
Upgrade license from FL MGUARD DM 100 to FL MGUARD DM UNLIMITED.			
Startup and induction for FL MGUARD DM.			

new

Central management software for FL MGUARD



Network management software for startup and monitoring

Technical data

> 1 GHz	
512 Mbyte	
4 Gbyte (free memory space (server), 500 MB free memory space (client))	
CD-ROM	
Ethernet Port	
MS Windows 2000 SP2 Windows XP Linux	
Central management software for up to 100 FL MGUARD devices	
-	
English	

Technical data

	> 1.5 GHz
	2 Gbyte
	min. 1 Gbyte
	CD-RW/DVD-RW
	Ethernet Port
	Windows® 10 Windows® 8.1 (32-bit/64-bit) Windows® 7 (32-bit/64-bit)
	The FL Network Manager Basic software simplifies the startup of Managed Switches and provides a central configuration point
	The Network Manager identifies the network participants and permits, in addition to IP parameter assignment, easy multi-device firmware updates and configuration of the most important Industrial Ethernet functions
	English

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGUARD DM 100	2700183	1
FL MGUARD DM UNLIMITED	2981974	1

Accessories

FL MGUARD DM UPD	2700222	1
FL MGUARD DM DEVICE UPGRADE	2700223	1
FL MGUARD PROF SERVICE 2	2700185	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL NETWORK MANAGER BASIC	2702889	1

Accessories

Network Integration

The professional and exact implementation of networking concepts is an important element on the way to achieving network reliability and security. We are therefore at your side not only as a consulting partner, but also to provide support during the implementation and startup of your network.

This includes both the development of configurations as well as their documentation and rollout. We can also incorporate management systems. Further, we take care to quickly implement any recommendations resulting from the periodic check-ups (see Network Service package).

Our service portfolio:

– Configuration and rollout
– Startup support
– Network diagnostics
– Preconfiguration of network devices from Phoenix Contact

Components from Phoenix Contact:

– Switches and routers
– Wireless components
– Network management software
– Security appliances
– Cloud services

Professional start-up and configuration

Description	Ordering data		
	Type	Order No.	Pcs./Pkt.
Services for Industrial Ethernet - Professional startup and configuration	NETWORK INTEGRATION	2702892	1

Network Service

Our Network Service package includes a design consultation, as well as a check-up and evaluation of your individual industrial network.

Because an initial evaluation of the situation provides the basis for an operative network, we analyze and/or test the existing network infrastructure with regards to network connections, and, if needed, also the processes. We will then discuss these results with you and derive a suitable set of rules.

We use these results and your requirements as the basis for developing a concept for the reliable and secure networking of your industrial components. If desired, this concept can be based on applicable standards, norms, and recommendations.

To achieve the highest possible availability for your individual solution, we check and evaluate it periodically for up-to-dateness, new requirements or purposes. This allows us to make recommendations for potential improvements.

Our service portfolio:

– Tests and analysis
– Evaluation and documentation
– Maintenance, consultation, and planning
– Concept development for an automation network
– Development of safety concepts
– Security tests and penetration
– Evaluation of your network according to security standards

Individual consulting for your Network Planning and Security

Description	Ordering data		
	Type	Order No.	Pcs./Pkt.
Services for Industrial Ethernet - Individual consultation on network planning and security	NETWORK SERVICE	2702890	1

Network Support

A complex network infrastructure requires maintenance and, above all, professional support when faults or problems occur.

If your network is not working according to your expectations, we will eliminate any faults. To guarantee the highest degree of availability of your infrastructure, we analyze your network. We assist with configuration modifications and make recommendations regarding interaction with other components.

When you experience a security incident, we can provide targeted support in analyzing cause and effect, and in taking appropriate countermeasures.

Our service portfolio:

- Support with troubleshooting
- Support with the hardware check
- Network analysis
- Configuration check
- Advice and support during incidents, if needed
- Management of security vulnerability, if needed
- Fulfillment of customer-specific requirements, if applicable

Troubleshooting

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Services for Industrial Ethernet - Troubleshooting	**NETWORK SUPPORT**	2702893	1

Network Training

Depending on specific needs, our goal is to enhance your and your employees' knowledge about Ethernet networks and network security. Our training courses cover the basics as well as details of the network and security components used. We refer directly to project-specific requirements.

Providing basic knowledge is an important part of the training courses. Both beginners and advanced learners hear about the specific requirements of automation in the context of networking. Moreover, participants in the training learn, in theory and in practice, how to properly use and handle our components. The knowledge transfer is completed by the most frequently used process data protocols, such as PROFINET or EtherNet/IP™.

Customers can choose from the following course packages:

Basic training

- Ethernet basics
- Security awareness

Training courses on network components used

- Switches and routers
- Wireless components
- Network management software
- Security appliances (mGuard and mGuard Centerport)
- Management software for security appliances (mDM)

Training on Industrial Ethernet and cyber security

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Services for Industrial Ethernet - Training on Industrial Ethernet and cyber security	**NETWORK TRAINING**	2702891	1

PROFINET proxies

Gateways and proxies from Phoenix Contact are the intelligent solution for integrating networks into other networks.

Your advantages:

– 1:1 integration of networks or segments, thanks to proxy technology
– Easy system modernization with transparent communication over multiple bus systems
– Versatile diagnostics: thanks to topology detection and manufacturer-independent diagnostic concepts
– Fast device replacement with optional CF card as parameterization memory

Proxy for INTERBUS

Do you want to integrate an INTERBUS application into a PROFINET network? Then the FL NP PND-4TX IB is the ideal solution. Simply parameterize the device using your corresponding programming tool. Use the integrated switch in the control cabinet as an uplink to the higher-level control system or in the field for series connection.

Proxy for PROFIBUS

Integrate controllers, I/O stations, and other automation devices seamlessly into a PROFIBUS network. Each PROFIBUS device can be configured and diagnosed directly using the FL NP PND-4TX PB. I/O signals of PROFIBUS devices are linked directly to program variables from the application. The PROFIBUS proxy is operated exclusively using PC Worx.

Additional features:

– Data exchange, diagnostics, and parameterization are via the PROFINET protocol
– They can be integrated and parameterized in any controller using the PROFINET functionality
– LLDP support for topology detection
– PROFINET update rates ≥ 1 ms

PROFINET INTERBUS proxy

Technical data

PROFINET		
Specification		PROFINET-IO RT, Spec. 2.2
Conformance class		B
Update rate		min. 1 ms
Software		
		Diagnostics software: DIAG+, version 2.0 or higher Configuration software: using the GSDML file or PC WORX version 5.0 or higher
Ethernet		
Connection method		RJ45 socket
Transmission speed		10/100 Mbps
INTERBUS		
Interface		INTERBUS (Master)
Connection method		9-pos. D-SUB socket
Number		1
Number of I/O nodes		8192
Number of devices with parameter channel		max. 126 (512 words)
Transmission speed		-
PROFIBUS		
Interface		-
Connection method		-
Number		-
Transmission speed		-
Number of supported devices		
Number of supported devices		max. 512 (Depending on the control class and data direction)
Power supply		
Supply voltage		24 V DC
Supply voltage range		18.5 V DC ... 30.2 V DC
Typical current consumption		typ. 350 mA
General data		
Dimensions	W / H / D	128 mm / 95 mm / 69 mm
Ambient temperature (operation)		-25 °C ... 60 °C
Ambient temperature (storage/transport)		-25 °C ... 70 °C

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Proxy for PROFINET - INTERBUS - INTERBUS FO - PROFIBUS	**FL NP PND-4TX IB**	2985974	1

Accessories

Parameterization memory	**CF FLASH 256MB**	2988780	1

PROFINET INTERBUS fiber optic proxy

PROFINET PROFIBUS proxy for PC Worx control systems

Technical data	
PROFINET-IO RT, Spec. 2.2	PROFINET-IO RT, Spec. 2.1
B	B
min. 1 ms	min. 1 ms
Diagnostics software: DIAG+, version 2.0 or higher Configuration software: using the GSDML file or PC WORX version 5.0 or higher	Diagnostics software: DIAG+, version 2.0 or higher Configuration software PC WORX starting from Version 5.20, Service Pack 3
RJ45 socket 10/100 Mbps	RJ45 socket 10/100 Mbps
INTERBUS (master) F-SMA connector 1 8192 max. 126 (512 words) -	- - - - - -
- - - -	PROFIBUS DP V0/V1 class 2 master 9-pos. D-SUB socket 1 to 12 Mbps
max. 512 (Depending on the control class and data direction)	max. 125
24 V DC 18.5 V DC ... 30.2 V DC typ. 350 mA	24 V DC 18.5 V DC ... 30.2 V DC 350 mA
128 mm / 95 mm / 69 mm -25 °C ... 60 °C -25 °C ... 70 °C	128 mm / 95 mm / 69 mm -25 °C ... 55 °C -25 °C ... 70 °C

Ordering data

Type	Order No.	Pcs./Pkt.
FL NP PND-4TX IB-LK	2985929	1

Accessories

CF FLASH 256MB	2988780	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL NP PND-4TX PB	2985071	1

Accessories

CF FLASH 256MB	2988780	1

Accessories

The reliability of networks is becoming more and more important and is a decisive factor for the future of entire companies. Independent studies show that more than 70% of network errors and crashes are due to faulty cabling infrastructure and manipulation of the connecting cables.

With the new accessories for Factoryline patch cables, the various safety requirements for automation are comprehensively met.

Dust protection for SFN switches and FL MC 1000 and 2000 media converters

Security lock for SFN switches and FL MC 1000 and 2000 media converters

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Dust protection with color marking, for SFN switch and angled patch connector						
- Black	**FL DUST CVR BK**	2891107	10			
- Blue	**FL DUST CVR BU**	2891204	10			
- Brown	**FL DUST CVR BN**	2891301	10			
- Yellow	**FL DUST CVR YE**	2891408	10			
- Gray	**FL DUST CVR GY**	2891505	10			
- Green	**FL DUST CVR GN**	2891602	10			
- Red	**FL DUST CVR RD**	2891709	10			
- Violet	**FL DUST CVR VT**	2891806	10			
- White	**FL DUST CVR WH**	2891903	10			
Security frame for SFN switch and patch fields						
- Green				**FL PLUG GUARD GN**	2891615	20
- Red				**FL PLUG GUARD RD**	2891712	20
- White				**FL PLUG GUARD WH**	2891819	20
Locking element for security frame FL PLUG GUARD...						
- Locking element				**FL PORT GUARD**	2891220	20
- Key				**FL PLUG GUARD KEY**	2891327	1
Color marking for FL CAT... Patch...						
- Black						
- Blue						
- Brown						
- Yellow						
- Gray						
- Green						
- Red						
- Violet						
Security element for FL CAT ...patch...						
- Security element						
- Security element, lockable						
- Key						
Dust protection cap for RJ45 socket						

Color coding for RJ45 FL patch cables

Security element for RJ45 FL patch cables

Dust protection for RJ45 sockets

Ordering data

Type	Order No.	Pcs./Pkt.
FL PATCH CCODE BK	2891194	20
FL PATCH CCODE BU	2891291	20
FL PATCH CCODE BN	2891495	20
FL PATCH CCODE YE	2891592	20
FL PATCH CCODE GY	2891699	20
FL PATCH CCODE GN	2891796	20
FL PATCH CCODE RD	2891893	20
FL PATCH CCODE VT	2891990	20

Ordering data

Type	Order No.	Pcs./Pkt.
FL PATCH SAFE CLIP	2891246	20
FL PATCH GUARD	2891424	20
FL PATCH GUARD KEY	2891521	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL RJ45 PROTECT CAP	2832991	10

RAD-2400-IFS
RAD-ID
RAD-DI4-IFS
RAD-DOR4-IFS
RAD-AI4-IFS
RAD-A04-IFS
RAD-DAIO6-IFS
IO-MAP
DIP1
ANT
S-PORT
SET
PHOENIX CONTACT

Wireless data communication

Signals that could previously only be acquired with a great deal of effort, or not at all, can now be acquired and transmitted quickly and efficiently using wireless systems.

Wireless LAN

WLAN is a wireless standard according to IEEE 802.11 a/b/g/n for creating wireless networks.

– High data rates of up to 300 Mbps
– Fast roaming
– Device mobility in wide area networks
– High degree of reliability thanks to MIMO (multiple input, multiple output) technology

Trusted Wireless

Trusted Wireless is a form of wireless technology that has been designed specifically for industrial applications.

– Long range from a few hundred meters to several kilometers
– Robust and reliable communication in industrial environments
– License-free ISM band
– High local system density of several hundred networks possible
– Can be operated in parallel with WLAN 802.11 and Bluetooth systems without interference
– FHSS method for high immunity to interference

WirelessHART

WirelessHART is a transmission technology intended for process automation.

– Wireless module according to IEEE 802.15.4
– Time-synchronized communication
– Supports fully meshed networks
– Secure data transfer

Bluetooth

With Bluetooth, you can configure local wireless networks with up to seven devices.

– Range of up to 100 m in industrial halls and up to 200 m outdoors
– Cyclic and fast data transmission of small data packets
– High local system density, i.e., WLAN 802.11 systems can be operated in parallel without interference
– High data security thanks to 128-bit data encryption
– FHSS method for high immunity to interference

Product overview	**450**
Wireless Ethernet	
Industrial WLAN	**452**
Industrial Bluetooth	**455**
Wireless I/O / Wireless Serial	
Radioline wireless transceivers (2.4 GHz, 900 MHz, 868 MHz)	**457**
Multipoint multiplexer	**459**
Wireless I/O	
I/O extension modules	**460**
WirelessHART gateway and adapter (2.4 GHz)	**464**
Bluetooth wireless modules (2.4 GHz)	**466**
Trusted Wireless Ethernet	
RAD-Line wireless transceiver (2.4 GHz, 900 MHz)	**468**
I/O extension modules	**470**
Antennas and cables	**472**
Remote communication	**348**

Product overview

Wireless Ethernet

Industrial WLAN – WLAN access point and Ethernet adapter
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Industrial WLAN – WLAN access point
Page 453

Industrial Bluetooth – access point and Ethernet adapter
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Wireless I/O / Wireless Serial

2.4 GHz – wireless transceiver for serial interfaces
Page 457

868 MHz – wireless transceiver for serial interfaces
Page 457

900 MHz – wireless transceiver for serial interfaces
Page 457

Multipoint multiplexer for RS-485 bus system
Page 459

Wireless I/O

Analog/digital I/O module, 2 digital I/Os and 1 analog I/O
Page 460

Digital I/O modules, 4 inputs or 4 relay outputs, 8 inputs or 8 transistor outputs
Page 460

Analog I/O modules, 4 inputs or 4 outputs
Page 462

Temperature I/O module, 4 Pt 100 inputs
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Wireless I/O

Bluetooth wireless modules (2.4 GHz)
Wireless multiplexer with antennas
Page 466

WirelessHART

WirelessHART gateway
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WirelessHART adapter
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Trusted Wireless Ethernet

900 MHz – wireless transceiver
with Trusted Wireless, for Ethernet
Page 468

2.4 GHz – wireless transceiver
with WLAN 802.11b/g, for Ethernet
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Trusted Wireless Ethernet

Analog module for
four inputs or four outputs
Page 470

Digital module for
eight inputs or eight outputs
Page 470

Analog/digital module for
two digital I/Os and one analog I/O
Page 471

Digital module for
two counter/frequency inputs or
two counter/frequency outputs
Page 471

Remote communication

Alarm generation –
remote signaling and remote control system
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Remote maintenance –
mGUARD security router
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Remote control –
mobile router
Page 364

Antennas and cables

Antennas
Page 472

Adapters, extension cables
Page 480

WLAN access point

The latest generation of WLAN modules offers maximum reliability, data throughput, and range.

Features:

– WLAN 5100 brings WLAN 802.11n to industrial applications and with it a data rate of up to 300 Mbps
– Central cluster management enables the entire wireless network to be set up in just minutes
– MiMo technology with three antennas for wireless communication that is more robust, faster, and covers a wider range
– Optimized for fast roaming under industrial conditions

WLAN

WLAN access point/2.4 GHz, 5 GHz client 802.11 a/b/g/n

Ex:

Technical data

Wireless interface		
Wireless standard		IEEE 802.11
Frequency band		2.4 GHz / 5 GHz
Transmission power		max. 23 dBm
Antenna connection method		RSMA (female)
Number		3
Antenna		
Assembly instructions		Antennas not included in scope of supply
Ethernet ports		
Number		2
Connection method		RJ45 socket
Power supply for module electronics		
Supply voltage		24 V DC
Connection method		Via COMBICON
Supply voltage range		10 V DC ... 36 V DC
Supply current		200 mA
Security		
		802.11i WPA PSK (preshared key) WPA2 AES TKIP Supports 802.1X/RADIUS MAC filter
Function		
Operating modes		Access point/client adapter/repeater/WDS bridge
Basic functions		SNMP (V2/V3), CLI, WPS, DHCP, DCP, BootP, HTTP, HTTPS, Syslog, SD card, dual FW image, 1 x DI, 1 x DO, 2 x Ethernet 10/100 Mbit, auto crossover, auto negotiation, MODE button
Configuration		Cluster management, web-based management, WPS
General data		
Wireless licenses		EU, more countries in e-shop
Dimensions	W / H / D	40 mm / 109 mm / 109 mm
Degree of protection		IP20
Ambient temperature (operation)		-25 °C ... 60 °C (extended temperature range on request)
Permissible humidity (operation)		10 % ... 95 % (non-condensing)
Air pressure (operation)		800 hPa ... 1080 hPa (up to 2000 m above mean sea level)
Shock in acc. with EN 60068-2-27/IEC 60068-2-27		30g
Vibration resistance in acc. with EN 60068-2-6/IEC 60068-2-6		5g

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Wireless LAN Access Point			
- WLAN 802.11 a,b,g,n, frequency 2.4 GHz, 5 GHz, IP20	**FL WLAN 5100**	2700718	1
- Approval for the USA and Canada	**FL WLAN 5101**	2701093	1
- Approval for Japan	**FL WLAN 5102**	2701850	1

Accessories

Parameterization memory, flash card without license	**SD FLASH 2GB**	2988162	1
Control cabinet set, IP66, including DIN rail, plugs, and screw connections	**FL RUGGED BOX**	2701204	1
- With 3 omnidirectional antennas and antenna cables	**FL RUGGED BOX OMNI-1**	2701430	1
- With 3 omnidirectional antennas, antenna cables, and 100 ... 240 V AC power supply	**FL RUGGED BOX OMNI-2**	2701439	1
- With one directional antenna, antenna cable, and 100 ... 240 V AC power supply	**FL RUGGED BOX DIR-1**	2701440	1

WLAN access point

new

Use the WLAN 1100 wireless module from Phoenix Contact to very easily install a fast and stable WLAN network on your machines. Featuring integrated antennas and extreme robustness, the space-saving module has been carefully considered down to the last detail for applications in machine building.

Features:

- Inexpensive and complete solution with integrated antennas and wireless module in one single device
- Fast and reliable wireless communication, thanks to powerful antenna technology
- Installing the module directly on machines, mobile vehicles or control cabinets results in space savings in the control cabinet
- Fast and easy connection, thanks to single-hole mounting
- Extremely robust housing, shockproof according to IK08
- Optimized for fast roaming under industrial conditions

WLAN

WLAN access point/client 2.4 GHz, 5 GHz Internal MIMO antennas

Technical data

Wireless interface		
Wireless standard		IEEE 802.11
Frequency band		2.4 GHz / 5 GHz
Transmission power		max. 20 dBm (EIRP)
Antenna connection method		(Internal)
Ethernet ports		
Number		1
Connection method		RJ45 socket
Power supply for module electronics		
Supply voltage		24 V DC
Connection method		Via COMBICON
Supply voltage range		18 V DC ... 32 V DC
Supply current		110 mA (at 24 V DC)
Security		
		802.11i WPA PSK (preshared key) WPA2 AES TKIP MAC filter
Function		
Operating modes		Access point/client adapter/repeater/WDS bridge
Configuration		Web-based management, automated CLI
General data		
Wireless licenses		EU, more countries in e-shop
Dimensions	W / H / D	62.8 mm / 36.5 mm / 113.2 mm
Degree of protection		IP54
Ambient temperature (operation)		0 °C ... 60 °C
Permissible humidity (operation)		5 % ... 95 % (non-condensing)
Air pressure (operation)		800 hPa ... 1080 kPa (up to 2000 m above mean sea level)
Shock in acc. with EN 60068-2-27/IEC 60068-2-27		30g, 11 ms half-sine shock pulse
Vibration resistance in acc. with EN 60068-2-6/IEC 60068-2-6		5g, 10-150 Hz

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Wireless LAN Access Point			
- WLAN 802.11 a,b,g,n, frequency 2.4 GHz, 5 GHz, IK08	**FL WLAN 1100**	2702534	1
- Approval for the USA and Canada	**FL WLAN 1101**	2702538	1

Accessories

Mechanical adapter, for protecting the rear connector when not mounted directly on control cabinets, etc.	**FL M32 ADAPTER**	2702544	1

Industrial WLAN – WLAN Ethernet adapter

Factoryline WLAN devices have been developed specifically for use under harsh industrial conditions.

Features:

– Maximum security according to IEEE 802.11i with AES encryption
– 2.4 GHz and 5 GHz supported
– High resistance to vibration, shock, and EMI

With internal directional antenna

With external antenna connection

Ex:

Ex:

		Technical data		Technical data
		FL WLAN EPA	FL WLAN EPA 5N	
Wireless interface				
Wireless standard		IEEE 802.11		IEEE 802.11
Frequency band		2.4 GHz	5 GHz	2.4 GHz/5 GHz
Transmission power		max. 20 dBm (EIRP)	max. 14 dBm (EIRP)	max. 20 dBm
Antenna connection method		(Internal)		RSMA (female)
Antenna				
Connection method		permanently installed		RSMA (male)
Assembly instructions		Internal circularly polarized directional antenna		External OMNI omnidirectional antenna supplied as standard, antennas can be exchanged
Ethernet ports				
Connection method		M 12 connectors (D-coded, female)		M 12 connectors (D-coded, female)
Power supply for module electronics				
Supply voltage		24 V DC		24 V DC
Connection method		M12 connector (A-coded, male)		M12 connector (A-coded, male)
Supply voltage range		9 V DC ... 30 V DC		9 V DC ... 30 V DC
Supply current		76 mA (at 24 V DC)		76 mA (at 24 V DC)
Security				
		802.11i WPA PSK (preshared key) WPA2 PSK AES WEP 64 bit/128 bit TKIP Supports 802.1X/RADIUS		802.11i WPA PSK (preshared key) WPA2 PSK AES WEP 64 bit/128 bit TKIP Supports 802.1X/RADIUS
Function				
Operating modes		Ethernet client adapter		Ethernet client adapter
Configuration		Web interface, MODE button, AT commands (TCP/IP), SSC		Web interface, MODE button, AT commands (TCP/IP), SSC
General data				
Wireless licenses		Europe, USA, Canada, additional countries in the e-shop		Europe, USA, Canada, additional countries in the e-shop
Dimensions	W / H / D	66 mm / 91 mm / 34 mm		66 mm / 91 mm / 34 mm
Degree of protection		IP65		IP65
Ambient temperature (operation)		-40 °C ... 65 °C		-40 °C ... 65 °C
Permissible humidity (operation)		5 % ... 90 % (non-condensing)		5 % ... 90 % (non-condensing)
Air pressure (operation)		795 hPa ... 1080 hPa (up to 2000 m above mean sea level)		795 hPa ... 1080 hPa (up to 2000 m above mean sea level)
Mounting type		Wall mounting		Wall mounting

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Wireless LAN Ethernet port adapter - Internal 2.4 GHz directional antenna - Internal 5 GHz directional antenna - External RSMA antenna connection (female)	**FL WLAN EPA** **FL WLAN EPA 5N**	2692791 2700488	1 1	**FL WLAN EPA RSMA**	2701169	1

	Accessories			Accessories		
Mounting material, for wall or mast mounting	**FL EPA WMS**	2701134	1	**FL EPA WMS**	2701134	1
Mounting material, for DIN rail mounting	**FL EPA RMS**	2701133	1	**FL EPA RMS**	2701133	1

Industrial Bluetooth

Bluetooth modules for the wireless integration of Ethernet-capable devices in the control network. Optimized for use in PROFINET/PROFIsafe networks.

Features:

– Protocol-transparent communication on Layer 2
– WLAN coexistence functions AFH, LEM, black channel listing
– Integrated special antenna (EPA)
– Reliable wireless transmission of safety-related data signals using SafetyBridge technology

Bluetooth access point

Solution set, including cable

Ex:

		Technical data		Technical data
		FL BT EPA	FL BT EPA MP	
Wireless interface				
Wireless standard		Bluetooth 2.1 + EDR		Bluetooth 2.1 + EDR
Frequency range		2.402 GHz ... 2.48 GHz (ISM bandwidth)		2.402 GHz ... 2.48 GHz (ISM bandwidth)
Transmission power		max. 15 dBm (EIRP)	max. 12 dBm (EIRP)	max. 15 dBm (EIRP)
Wireless modules that can be connected		1	7	1
Profiles supported		PAN		PAN
Antenna connection method		(Internal)	RSMA (female)	(Internal)
Antenna				
Connection method		permanently installed	RSMA (male)	permanently installed
Assembly instructions		Internal circularly polarized directional antenna	External OMNI omnidirectional antenna supplied as standard, antennas can be exchanged	Internal circularly polarized directional antenna
Ethernet ports				
Connection method		M 12 connectors (D-coded, female)		M 12 connectors (D-coded, female)
Power supply for module electronics				
Supply voltage		24 V DC		24 V DC
Connection method		M12 connector (A-coded, male)		M12 connector (A-coded, male)
Supply voltage range		9 V DC ... 30 V DC		9 V DC ... 30 V DC
Current consumption		46 mA (at 24 V DC)		46 mA (per module at 24 V DC)
Security				
		128-bit data encryption Authentication PIN Non-discoverable		128-bit data encryption Authentication PIN Non-discoverable
Function				
Operating modes		Ethernet client adapter	BT access point	Ethernet client adapter
Function		P2P Client	P2P Client Access point	P2P Bridge
Configuration		Web interface, MODE button, AT commands (TCP/IP), SSC		Web interface, MODE button, AT commands (TCP/IP), SSC
General data				
Wireless licenses		Europe, additional countries in the e-shop		Europe, additional countries in the e-shop
Dimensions	W / H / D	66 mm / 91 mm / 34 mm		66 mm / 91 mm / 34 mm
Degree of protection		IP65		IP65
Protection class		III, IEC 61140, EN 61140, VDE 0140-1		III, IEC 61140, EN 61140, VDE 0140-1
Ambient temperature (operation)		-40 °C ... 65 °C		-40 °C ... 65 °C
Permissible humidity (operation)		5 % ... 90 % (non-condensing)		5 % ... 90 % (non-condensing)
Air pressure (operation)		795 hPa ... 1080 hPa (up to 2000 m above mean sea level)		795 hPa ... 1080 hPa (up to 2000 m above mean sea level)
Mounting type		Wall mounting	Wall mounting, optional DIN rail mounting	Wall mounting

Description	Ordering data Type	Order No.	Pcs./Pkt.	Ordering data Type	Order No.	Pcs./Pkt.
Bluetooth Access Point						
	FL BT EPA MP	2701416	1			
Bluetooth Ethernet Client adapter						
	FL BT EPA	2692788	1			
Protocol-transparent **Ethernet wireless path**						
				FL BT EPA AIR SET	2693091	1
	Accessories			**Accessories**		
Mounting material, for wall or mast mounting	**FL EPA WMS**	2701134	1	**FL EPA WMS**	2701134	1
Mounting material, for DIN rail mounting	**FL EPA RMS**	2701133	1	**FL EPA RMS**	2701133	1

Easy startup with I/O mapping - the Radioline wireless system

Radioline is the transmission system from Phoenix Contact for extended systems and networks with up to 250 stations.

Radioline transmits I/O signals as well as serial data and is therefore very versatile. In addition, you can implement various network structures: from a simple point-to-point connection to complex mesh networks.

Thanks to the latest Trusted Wireless technology, Radioline is the ideal choice for industrial use.

Network applications

– I/O data mode: simple I/O signal distribution in the network
– PLC/Modbus RTU mode: I/O integration in the control level using the Modbus protocol
– Serial data mode: networking of controllers and serial I/O devices, simple RS-232/RS-485 cable replacement

What advantages does I/O mapping offer?

I/O mapping makes it considerably easier to assign input and output signals in your systems. With a slight turn of the thumb wheel, you can distribute and multiply I/O signals freely in your network – without the need for any complex programming.

Trusted Wireless

Trusted Wireless technology is specifically designed for the reliable transmission of data and signals over long distances.

The new Version 2.0 also offers functions such as adjustable data rates, encryption, extended diagnostics, and parallel operation of multiple networks.

The range* depends on the wireless system selected:

– 2.4 GHz - up to 5 km
– 868 MHz - up to 20 km
– 900 MHz - up to 32 km

Notes:

*The range may be considerably above or below that stated. It is dependent on the environment, antenna technology, transmission power, and the product used.

The latest country registrations for the relevant product can be found on the Internet at phoenixcontact.com.

Wireless path	
Direction	
Frequency range	
Data rate (adjustable)	
Number of channels	
Security	
Connection method	
Serial port	
Connection method	
Serial transmission speed	
Termination resistor (switchable via DIP switches)	
Analog output	
Signal range	
Digital output	
Contact type	
Switching voltage	
Switching current	
General data	
Supply voltage	
Current consumption	
Degree of protection	
Ambient temperature range	
Permissible humidity (operation)	
Dimensions	W / H / D
Screw connection solid/stranded/AWG	
EMC note	
Conformance/Approvals	
ATEX	
IECEx	
UL, USA/Canada	

Description
Wireless module - can be extended with I/O extension modules
- With Japan approval (no ATEX, IECEx or UL approval)

CONFSTICK, configuration memory for the safe parallel operation of several wireless paths or networks
RF band 1
RF band 3
RF band 5
RF band 7
Memory stick, for saving custom configuration data
USB cable, for diagnostics and extended configuration

2.4 GHz wireless transceiver, for worldwide use

Ex:
Housing width 17.5 mm

Technical data

Bi-directional	
2.4002 GHz ... 2.4785 GHz	
16 kbps / 125 kbps / 250 kbps	
8 x 55	
128-bit data encryption	
RSMA (female)	
RS-232	RS-485
COMBICON connector screw terminal block	COMBICON connector screw terminal block
0.3 ... 115.2 kbps	0,3 ... 187,5 kbps
-	390 Ω / 150 Ω / 390 Ω
RSSI voltage output	
0 V ... 3 V	
RF link relay output	
PDT	
30 V AC/DC / 60 V DC	
500 mA (30 V AC/DC)	
19.2 V DC ... 30.5 V DC	
≤ 65 mA (at 24 V DC, at 25 °C, stand-alone)	
IP20	
-40 °C ... 70 °C	
20 % ... 85 %	
17.5 / 99 / 114.5 mm	
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Class A product, see page 525	
II 3 G Ex nA nC IIC T4 Gc	
Ex nA nC IIC T4 Gc	
UL 508 Listed	
Class I, Div. 2, Groups A, B, C, D T4A	
Class I, Zone 2, IIC T4	

Ordering data

Type	Order No.	Pcs./Pkt.
RAD-2400-IFS	2901541	1
RAD-2400-IFS-JP	2702863	1

Accessories

RAD-CONF-RF3	2902814	1
RAD-CONF-RF5	2902815	1
RAD-CONF-RF7	2902816	1
RAD-MEMORY	2902828	1
RAD-CABLE-USB	2903447	1

868 MHz wireless transceiver, for license-free use in Europe

Ex:
Housing width 17.5 mm

Technical data

Bi-directional	
869.4 MHz ... 869.65 MHz	
1.2 kbps / 9.6 kbps / 19.2 kbps / 60 kbps / 120 kbps	
14	
128-bit data encryption	
RSMA (female)	
RS-232	RS-485
COMBICON connector screw terminal block	COMBICON connector screw terminal block
0.3 ... 115.2 kbps	0.3 ... 115.2 kbps
-	390 Ω / 150 Ω / 390 Ω
RSSI voltage output	
0 V ... 3 V	
RF link relay output	
PDT	
30 V AC / 60 V DC	
500 mA	
19.2 V DC ... 30.5 V DC	
≤ 65 mA (at 24 V DC, at 25 °C, stand-alone)	
IP20	
-40 °C ... 70 °C	
20 % ... 85 %	
17.5 / 99 / 114.5 mm	
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Class A product, see page 525	
II 3 G Ex nA nC IIC T4 Gc	
Ex nA nC IIC T4 Gc	
-	

Ordering data

Type	Order No.	Pcs./Pkt.
RAD-868-IFS	2904909	1

Accessories

RAD-868-CONF-RF1	2702197	1
RAD-MEMORY	2902828	1
RAD-CABLE-USB	2903447	1

900 MHz wireless transceiver, for license-free use in America

Ex:
Housing width 35 mm

Technical data

Bi-directional	
902 MHz ... 928 MHz	
16 kbps / 125 kbps / 250 kbps / 500 kbps	
-	
128-bit data encryption	
RSMA (female)	
RS-232	RS-485
COMBICON connector screw terminal block	COMBICON connector screw terminal block
0.3 ... 115.2 kbps	0.3 ... 115.2 kbps
-	390 Ω / 150 Ω / 390 Ω
RSSI voltage output	
0 V ... 3 V	
RF link relay output	
PDT	
30 V AC/DC	
500 mA	
10.8 V DC ... 30.5 V DC	
328 mA (@24 V DC)	
IP20	
-40 °C ... 70 °C	
20 % ... 85 %	
35 / 99 / 114.5 mm	
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
-	
-	
Class I, Div. 2, Groups A, B, C, D	

Ordering data

Type	Order No.	Pcs./Pkt.
RAD-900-IFS	2901540	1

Accessories

RAD-900-CONF-RF1	2702122	1
RAD-MEMORY	2902828	1
RAD-CABLE-USB	2903447	1

Radioline – I/O mapping now in wired format as well

The popular, straightforward method of distributing I/O information using white thumbwheels on the front of the equipment is now also available for RS-485 networks.

Addressing the RS-485 front module is quick and easy too – all it takes is a turn of the yellow thumbwheel. This enhances the Radioline system's flexibility, allowing it to be used for solutions in even more applications.

The device supports three functions:

Supplementing a wireless system

A Radioline wireless system on an existing master can be expanded to include new RS-485 stations. RS-485 and wireless modules form a combined system.

Operation in a purely RS-485 network

In an RS-485 network with up to 99 Radioline stations, you can now distribute I/O signals between the stations. This is done without the need for software configuration by simply turning the thumbwheel.

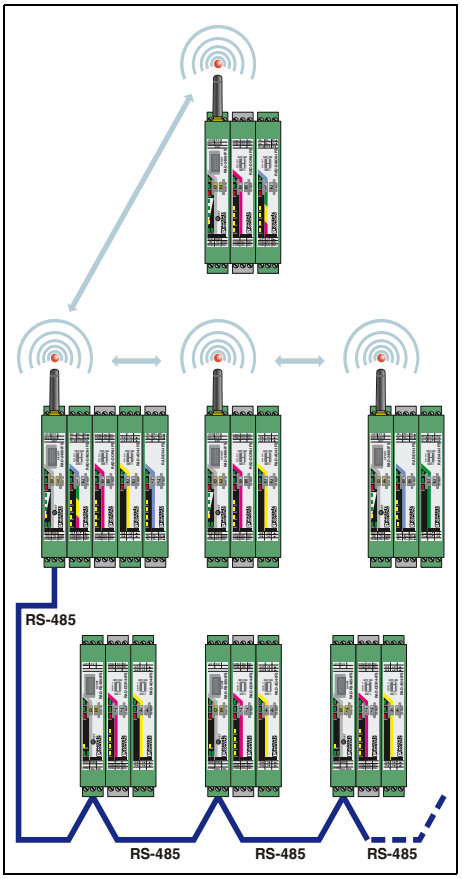
Stand-alone operation as a Modbus slave

The new Radioline RS-485 stations can also be operated on any Modbus/RTU master.

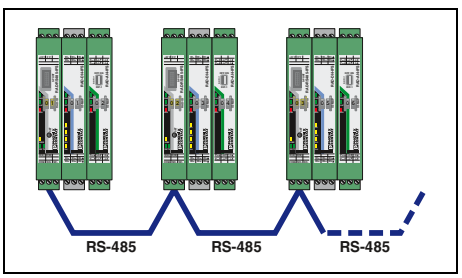
Alternative transmission media

To increase the range, it is of course possible to replace the RS-485 line with alternative transmission media.

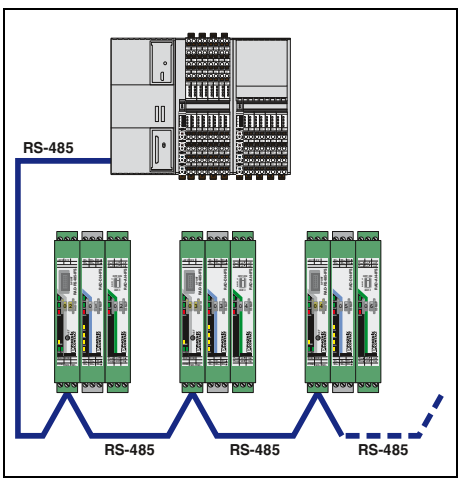
Phoenix Contact offers a range of converters for fiber-optic cables, SHDSL, wireless or Ethernet technology.



I/O to I/O in a combined system



I/O to I/O via RS-485



I/O to serial (Modbus/RTU slave)

Multipoint multiplexer

Your advantages
– Up to 99 bus stations in the network
– Modular extension with up to 32 I/O extension modules supported
– Quick and easy startup without programming
– Can be combined with Radioline wireless modules

RS-485 serial interface

Ex:
Housing width 17.5 mm

Technical data

Serial port		RS-485
Connection method		COMBICON connector screw terminal block
Serial transmission speed		0.3 ... 115.2 kbps (Default setting: 19.2/8/E/1)
Termination resistor (switchable via DIP switches)		390 Ω / 150 Ω / 390 Ω
Digital output		Link relay output
Contact type		PDT
Switching voltage		30 V AC/DC / 60 V DC
Switching current		500 mA (30 V AC/DC)
General data		
Supply voltage		19.2 V DC ... 30.5 V DC
Current consumption		≤ 65 mA (at 24 V DC, at 25 °C, stand-alone)
Degree of protection		IP20
Ambient temperature range		-40 °C ... 70 °C
Permissible humidity (operation)		20 % ... 85 %
Dimensions	W / H / D	17.5 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14
EMC note		Class A product, see page 525
Conformance/Approvals		
ATEX		II 3 G Ex nA nC IIC T4 Gc
IECEx		Ex nA nC IIC T4 Gc
UL, USA/Canada		UL 508 Listed Class I, Div. 2, Groups A, B, C, D T4A Class I, Zone 2, IIC T4

Ordering data

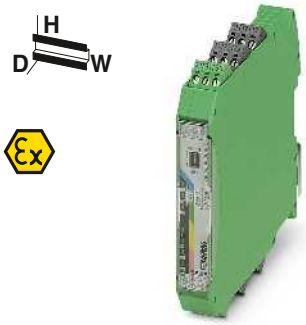
Description	Type	Order No.	Pcs./Pkt.
Multipoint multiplexer	**RAD-RS485-IFS**	2702184	1

Accessories

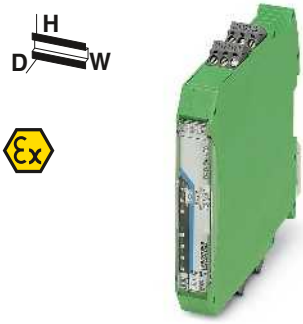
Shield connection terminal block, with snap-on foot, mounting on DIN rail NS 35..., for shield support on busbars Ø 3-8 mm	**SKS 8-SNS35**	3062786	10
Plug-in terminal, for connecting the incoming and outgoing bus line	**TVFKC 1,5/ 3-ST**	1713842	50
USB cable, for diagnostics and extended configuration	**RAD-CABLE-USB**	2903447	1

I/O extension modules

- Easy I/O mapping via thumb wheel
- Digital wide-range inputs (0 ... 250 V AC/DC)
- 0 ... 100 Hz digital pulse inputs
- Relay or transistor outputs
- Easy module replacement even during operation (hot swap)
- Extended temperature range (-40 °C ... +70 °C)



2 digital inputs/outputs and 1 analog input/output



4 digital inputs

Ex:
Housing width 17.5 mm

		Technical data		Technical data
Analog input				
Number of inputs		1		-
Resolution		16 bit		-
Signal range (configurable using the DIP switch)		0 mA ... 20 mA / 4 mA ... 20 mA		-
Accuracy		≤ 0.02 % (at 25 °C)		-
Supply voltage		≥ 12 V DC (For passive sensors (via terminal PWR1, +I1))		-
Digital input				
Number of inputs		2		4
Switching level	1 signal ("H")	10 V AC/DC ... 50 V AC/DC (Low-voltage input) 50 V AC/DC ... 250 V AC/DC (High-voltage input)		10 V AC/DC ... 50 V AC/DC (Low-voltage input) 50 V AC/DC ... 250 V AC/DC (High-voltage input)
Switching level	0 signal ("L")	0 V AC/DC ... 4 V AC/DC (Low-voltage input) 0 V AC/DC ... 20 V AC/DC (High-voltage input)		0 V AC/DC ... 4 V AC/DC (Low-voltage input) 0 V AC/DC ... 20 V AC/DC (High-voltage input)
Input frequency		≤ 2 Hz		≤ 2 Hz
Pulse input				
Number of inputs		-		-
Signal range		-		-
Input frequency		-		-
Pulse length		-		-
Analog output				
Number of outputs		1		-
Signal range		0 mA ... 20 mA 4 mA ... 20 mA	0 V ... 10 V	-
Accuracy		≤ 0.02 % (at 25 °C)	typ. 0.5 %	-
Load R_B		≤ 500 Ω	≥ 10 kΩ	-
Digital output				
Contact type		2 x Relay output		-
Switching voltage		250 V AC 24 V DC		-
Switching current	min./max.	≥ 10 mA / 2 A		-
Switching frequency		2 Hz		-
General data				
Supply voltage		19.2 V DC ... 30.5 V DC (DIN rail connector)		19.2 V DC ... 30.5 V DC (DIN rail connector)
Current consumption		≤ 95 mA (At 24 V DC, at 25°C)		≤ 11 mA (At 24 V DC, at 25°C)
Degree of protection		IP20		IP20
Ambient temperature range		-40 °C ... 70 °C		-40 °C ... 70 °C
Dimensions	W / H / D	17.5 / 99 / 114.5 mm		17.5 / 99 / 114.5 mm
EMC note		Class A product, see page 525		Class A product, see page 525
Conformance/Approvals				
ATEX		II 3 G Ex nA nC IIC T4 Gc		II 3 G Ex nA IIC T4 Gc
IECEx		Ex nA nC IIC T4 Gc		Ex nA IIC T4 Gc
UL, USA/Canada		UL 508 Listed Class I, Div. 2, Groups A, B, C, D T4A Class I, Zone 2, IIC T4		UL 508 Listed Class I, Div. 2, Groups A, B, C, D T4A Class I, Zone 2, IIC T4

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Analog/digital I/O module Digital input module Digital relay output module Digital/pulse input module Digital transistor output module	**RAD-DAIO6-IFS**	2901533	1

Ordering data

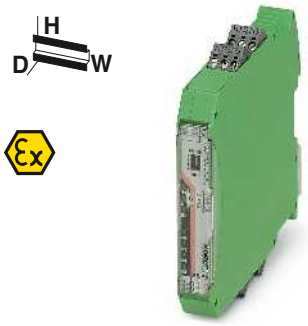
Type	Order No.	Pcs./Pkt.
RAD-DI4-IFS	2901535	1

Accessories

Analog/digital I/O module Digital relay output module Digital input module Digital transistor output module Digital/pulse input module	**RAD-DAIO6-IFS**	2901533	1

Accessories

RAD-DOR4-IFS	2901536	1



4 digital relay outputs

Ex:
Housing width 17.5 mm

Technical data	
-	-
-	-
-	-
-	-
-	-
-	8
-	10 V DC ... 30.5 V DC
-	0 V DC ... 4 V DC
-	≤ 10 Hz (Static mode)
-	2
-	0 V DC ... 30.5 V DC
-	< 100 Hz (Pulse counter mode)
-	≥ 5 ms (Pulse/pause ratio 1:1)
-	-
-	-
-	-
-	-
4 x Relay output	-
250 V AC 24 V DC	-
≥ 10 mA / 5 A (per channel)	-
2 Hz	-
19.2 V DC ... 30.5 V DC (DIN rail connector)	19.2 V DC ... 30.5 V DC (DIN rail connector)
≤ 55 mA (At 24 V DC, at 25°C)	≤ 18 mA (At 24 V DC, at 25°C)
IP20	IP20
-40 °C ... 70 °C	-40 °C ... 70 °C
17.5 / 99 / 114.5 mm	17.5 / 99 / 114.5 mm
Class A product, see page 525	Class A product, see page 525
II 3 G Ex nA nC IIC T4 Gc Ex nA nC IIC T4 Gc UL 508 Listed Class I, Div. 2, Groups A, B, C, D T4A Class I, Zone 2, IIC T4	II 3 G Ex nA IIC T4 Gc Ex nA IIC T4 Gc UL 508 Listed Class I, Div. 2, Groups A, B, C, D T4A Class I, Zone 2, IIC T4

Ordering data

Type	Order No.	Pcs./Pkt.
RAD-DOR4-IFS	2901536	1

Accessories

RAD-DI4-IFS	2901535	1

8 digital inputs and 2 pulse inputs

Ex:
Housing width 17.5 mm

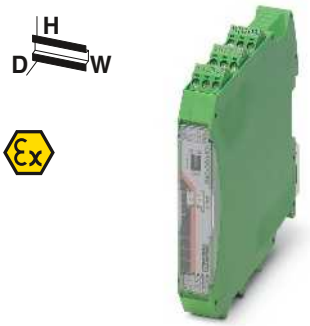
Technical data	
-	-
-	-
-	-
-	-
-	-
-	8
-	10 V DC ... 30.5 V DC
-	0 V DC ... 4 V DC
-	≤ 10 Hz (Static mode)
-	2
-	0 V DC ... 30.5 V DC
-	< 100 Hz (Pulse counter mode)
-	≥ 5 ms (Pulse/pause ratio 1:1)
-	-
-	-
-	-
-	-
4 x Relay output	-
250 V AC 24 V DC	-
≥ 10 mA / 5 A (per channel)	-
2 Hz	-
19.2 V DC ... 30.5 V DC (DIN rail connector)	19.2 V DC ... 30.5 V DC (DIN rail connector)
≤ 55 mA (At 24 V DC, at 25°C)	≤ 18 mA (At 24 V DC, at 25°C)
IP20	IP20
-40 °C ... 70 °C	-40 °C ... 70 °C
17.5 / 99 / 114.5 mm	17.5 / 99 / 114.5 mm
Class A product, see page 525	Class A product, see page 525
II 3 G Ex nA nC IIC T4 Gc Ex nA nC IIC T4 Gc UL 508 Listed Class I, Div. 2, Groups A, B, C, D T4A Class I, Zone 2, IIC T4	II 3 G Ex nA IIC T4 Gc Ex nA IIC T4 Gc UL 508 Listed Class I, Div. 2, Groups A, B, C, D T4A Class I, Zone 2, IIC T4

Ordering data

Type	Order No.	Pcs./Pkt.
RAD-DI8-IFS	2901539	1

Accessories

RAD-DO8-IFS	2902811	1



8 digital transistor outputs

Ex:
Housing width 17.5 mm

Technical data	
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
4 x Relay output	8 x Transistor output, active
250 V AC 24 V DC	30.5 V DC
≥ 10 mA / 5 A (per channel)	- / 200 mA (per channel)
2 Hz	10 Hz
19.2 V DC ... 30.5 V DC (DIN rail connector)	19.2 V DC ... 30.5 V DC (DIN rail connector)
≤ 55 mA (At 24 V DC, at 25°C)	≤ 22 mA (At 24 V DC, at 25°C)
IP20	IP20
-40 °C ... 70 °C	-40 °C ... 70 °C
17.5 / 99 / 114.5 mm	17.5 / 99 / 114.5 mm
Class A product, see page 525	Class A product, see page 525
II 3 G Ex nA nC IIC T4 Gc Ex nA nC IIC T4 Gc UL 508 Listed Class I, Div. 2, Groups A, B, C, D T4A Class I, Zone 2, IIC T4	II 3 G Ex nA IIC T4 Gc Ex nA IIC T4 Gc UL 508 Listed Class I, Div. 2, Groups A, B, C, D T4A Class I, Zone 2, IIC T4

Ordering data

Type	Order No.	Pcs./Pkt.
RAD-DO8-IFS	2902811	1

Accessories

RAD-DI8-IFS	2901539	1

I/O extension modules

- Easy I/O mapping via thumb wheel
- Analog inputs (0/4 ... 20 mA)
- Temperature inputs for Pt 100 sensors
- Analog outputs (0/4 ... 20 mA or 0 ... 10 V)
- Easy module replacement even during operation (hot swap)
- Extended temperature range (-40 °C ... +70 °C)

4 analog current inputs

Ex:
Housing width 17.5 mm

Technical data

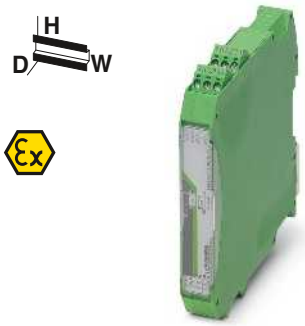
Analog input		
Number of inputs		4
Resolution		16 bit
Signal range (configurable using the DIP switch)		0 mA ... 20 mA / 4 mA ... 20 mA
Accuracy		≤ 0.02 % (at 25 °C)
Supply voltage		≥ 12 V DC (For passive sensors (via terminal PWR1, +I1))
Analog input		
Description of the input		-
Number of inputs		-
Temperature measuring range		-
Analog output		
Number of outputs		-
Signal range		-
Accuracy		-
Load R_B		-
General data		
Supply voltage		19.2 V DC ... 30.5 V DC (DIN rail connector)
Current consumption		≤ 120 mA (At 24 V DC, at 25°C)
Degree of protection		IP20
Ambient temperature range		-40 °C ... 70 °C
Dimensions	W / H / D	17.5 / 99 / 114.5 mm
EMC note		Class A product, see page 525
Conformance/Approvals		
ATEX		II 3 G Ex nA IIC T4 Gc
IECEx		Ex nA IIC T4 Gc
UL, USA/Canada		UL 508 Listed Class I, Div. 2, Groups A, B, C, D T4A Class I, Zone 2, IIC T4

Ordering data

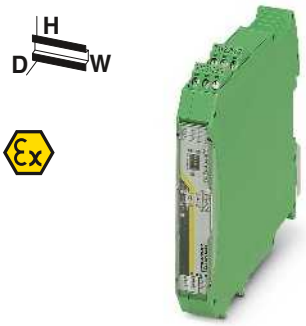
Description	Type	Order No.	Pcs./Pkt.
Analog input module Temperature input module Analog output module	**RAD-AI4-IFS**	2901537	1

Accessories

Analog output module Analog input module Temperature input module	**RAD-AO4-IFS**	2901538	1



4 temperature inputs



4 analog current/voltage outputs

Ex:
Housing width 17.5 mm

Technical data

-	
-	
-	
-	
-	
Pt 100 input	
4	
-50 °C ... 250 °C	
-	
-	
-	
-	
19.2 V DC ... 30.5 V DC (DIN rail connector)	
≤ 38 mA (At 24 V DC, at 25°C)	
IP20	
-40 °C ... 70 °C	
17.5 / 99 / 114.5 mm	
Class A product, see page 525	
II 3 G Ex nA IIC T4 Gc	
Ex nA IIC T4 Gc	
UL 508 Listed	
Class I, Div. 2, Groups A, B, C, D T4A	
Class I, Zone 2, IIC T4	

Ordering data

Type	Order No.	Pcs./Pkt.
RAD-PT100-4-IFS	2904035	1

Accessories

RAD-AO4-IFS	2901538	1

Ex:
Housing width 17.5 mm

Technical data

-	
-	
-	
-	
-	
-	
-	
-	
4	
0 mA ... 20 mA	0 V ... 10 V
4 mA ... 20 mA	
≤ 0.02 % (at 25 °C)	typ. 0.5 %
≤ 500 Ω	≥ 10 kΩ
19.2 V DC ... 30.5 V DC (DIN rail connector)	
≤ 115 mA (At 24 V DC, at 25°C)	
IP20	
-40 °C ... 70 °C	
17.5 / 99 / 114.5 mm	
Class A product, see page 525	
II 3 G Ex nA IIC T4 Gc	
Ex nA IIC T4 Gc	
UL 508 Listed	
Class I, Div. 2, Groups A, B, C, D T4A	
Class I, Zone 2, IIC T4	

Ordering data

Type	Order No.	Pcs./Pkt.
RAD-AO4-IFS	2901538	1

Accessories

RAD-AI4-IFS	2901537	1
RAD-PT100-4-IFS	2904035	1

WirelessHART gateway

The **RAD-WHG/WLAN-XD** is a WirelessHART gateway with integrated 802.11b/g WLAN transceiver. It converts HART data to Modbus/TCP for easy integration into almost any host system.

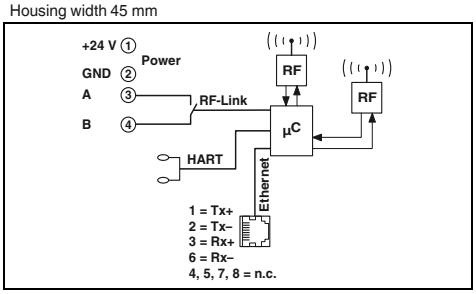
Features:

– Simple programming and diagnostics using an embedded web server or HART programmer
– WirelessHART gateway supports 250 WirelessHART devices
– 802.11b/g client can be used as WirelessHART backhaul connection with 802.11i (WPA2) 128-bit AES encryption
– Fully meshed routing (self-organizing and self-healing network) with WirelessHART
– WirelessHART uses "channel hopping" as a means of tolerating interference

WirelessHART gateway, for worldwide use

Ex:

Housing width 45 mm

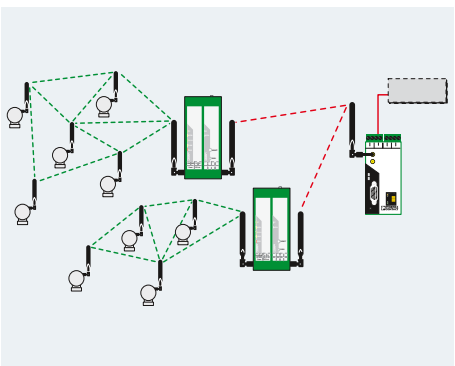


Technical data

Wireless path		
Interface description		WLAN as per IEEE 802.11 b/g
Direction		Bi-directional
Frequency range		2.4 GHz ... 2.472 GHz
Number of channels		13
Connection method		RSMA (female)
Wireless path		
Interface description		WirelessHART
Frequency range		2.4 GHz ... 2.4835 GHz
Transmission power		0 ... 10 dBm
Number of channels		15
Connection method		RSMA (female)
Ethernet interface		
Connection method		RJ45
Transmission speed		10/100 Mbps
General data		
Supply voltage		9 V DC ... 30 V DC
Current consumption	typ. / max.	125 mA (at 24 V DC) / 300 mA (at 24 V DC)
Degree of protection		IP20
Ambient temperature range		-40 °C ... 70 °C
Housing material		Polyamide PA non-reinforced
Dimensions	W / H / D	45 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 14
Conformance/Approvals		
CSA, USA		Class I, Zone 2, Group IIC; AEx nA IIC T4
CSA, Canada		Class I, Div. 2 Groups A,B,C,D Ex nA IIC T4

Ordering data

Description	Type	Order No.	Pcs./Pkt.
WirelessHART gateway			
	RAD-WHG/WLAN-XD	2900178	1



WirelessHART adapter

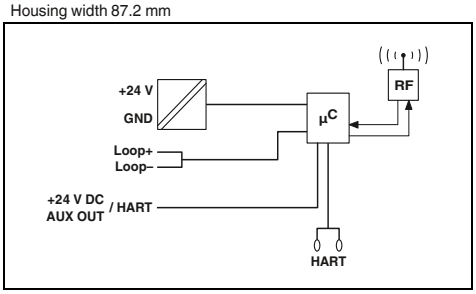
The **RAD-WHA-1/2NPT** is an adapter that allows up to 4 HART devices to be on a WirelessHART network.

Features:

– Allows wired HART devices to transfer data on a WirelessHART network
– Connect up to 4 HART device to one adapter
– Allows connection of one standard 4 ... 20 mA signal for easy integration of non-HART devices into a WirelessHART network
– 1/2-in. NPT fitting allows remote mounting or direct connection to instrument
– Removable antenna for connection of coaxial cable and high gain antenna

WirelessHART adapter, for worldwide use

Ex:
Housing width 87.2 mm



Technical data

Wireless path		
Interface description		WirelessHART
Direction		Bi-directional
Frequency range		2.4 GHz ... 2.4835 GHz
Number of channels		15
Connection method		N (female)
Analog input		
Number of inputs		1
Signal range		4 mA ... 20 mA
General data		
Supply voltage		11 V DC ... 30 V DC
Current consumption	max.	95 mA
Degree of protection		IP65
Ambient temperature range		-40 °C ... 70 °C
Housing material		Aluminum, die-cast, corrosion resistant, powder-coated
Dimensions	W / H / D	87.2 / 161 / 65.3 mm
Connection method		Flying leads, 20 AWG

Ordering data

Description	Type	Order No.	Pcs./Pkt.
WirelessHART adapter	**RAD-WHA-1/2NPT**	**2900100**	1

Bluetooth wireless modules (2.4 GHz)

new

Wireless MUX - the wireless signal cable

The Wireless MUX transmits 16 digital and 2 analog signals bidirectionally. The Wireless MUX is supplied ready to use: Unpack – connect – switch on – and you have a working wireless path.

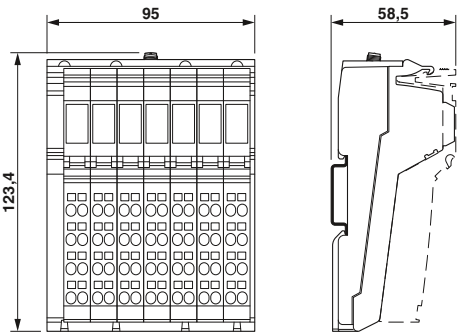
– Range*:
With omnidirectional antenna, 50 m to 100 m in halls, up to 200 m outdoors.

Features:

– Automatic establishment of the connection and signal exchange thanks to fixed device pairing
– No configuration or settings necessary
– Extremely robust and reliable
– Interference-free operation alongside WLAN
– Parallel operation of several Bluetooth systems

Notes:

* The range may be significantly above or below that stated, and depends on the environment, antenna technology, and the product used.



Wireless set, including antennae

Technical data

Wireless interface		
Wireless standard		Based on Bluetooth 4.0
Frequency range		2.402 GHz ... 2.48 GHz (ISM bandwidth)
Antenna connection method		RSMA (female)
Power supply for module electronics		
Supply voltage		24 V DC
Supply voltage range		19.2 V DC ... 30.5 V DC (via power connector)
Digital inputs		
Connection method		1-wire
Number of inputs		16
Digital outputs		
Connection method		1-wire
Number of outputs		16
Analog inputs		
Number of inputs		2
Voltage input signal		0 V ... 10 V
Current input signal		0 mA ... 20 mA
Measured value resolution		12 bits
Analog outputs		
Number of outputs		2
Voltage output signal		0 V ... 10 V
Current output signal		0 mA ... 20 mA
DAC resolution		12 bit
General data		
Dimensions	W / H / D	95 mm / 123.4 mm / 57 mm
Degree of protection		IP20
Ambient temperature (operation)		-25 °C ... 60 °C
EMC note		Class A product, see page 525
Conformance/Approvals		
Conformance		FCC Directive, Part 15.247 ISC Directive RSS 210
UL, USA/Canada		UL 508 Listed

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Wireless MUX set, consisting of two modules, each with 16 digital and 2 analog inputs and outputs			
- With OMNI antennas - Without antennas	**ILB BT ADIO MUX-OMNI**	2884208	1

new

Wireless set

Technical data

Based on Bluetooth 4.0 2.402 GHz ... 2.48 GHz (ISM bandwidth) RSMA (female)
24 V DC 19.2 V DC ... 30.5 V DC (via power connector)
1-wire 16
1-wire 16
2 0 V ... 10 V 0 mA ... 20 mA 12 bits
2 0 V ... 10 V 0 mA ... 20 mA 12 bit
95 mm / 123.4 mm / 57 mm IP20 -25 °C ... 60 °C
FCC Directive, Part 15.247 ISC Directive RSS 210 UL 508 Listed

Ordering data

Type	Order No.	Pcs./Pkt.
ILB BT ADIO MUX	2702875	1

RAD-Line Ethernet with Trusted Wireless

The **RAD-ISM-900-EN-BD...** industrial wireless radio allows a wireless connection of several decentralized controllers to a central location (controller) via an Ethernet or serial connection.

Features:

- Operates in the license-free 902-928 MHz ISM band
- Frequency-hopping spread spectrum technology
- Provides an interface for transfer of data between 900 MHz wireless and Ethernet, RS-232, RS-422 or RS-485 interfaces
- Contains an adjustable 10 mW... 1 W transmitter
- Supports TCP/IP, UDP and IP v4 protocols
- Programmable for point-to-point, point-to-multipoint and multipoint-to-point configurations
- Incorporates security using selectable 128/192/256-bit AES encryption
- **RAD-ISM-900-EN-BD-BUS** features an integrated bus foot to connect I/O modules (addressable via Modbus)
- Individual modules can be configured as master, slave or repeater using integrated web browser interface
- **RAD-ISM-900-EN-BD/B** is a dedicated slave radio with no Ethernet ports

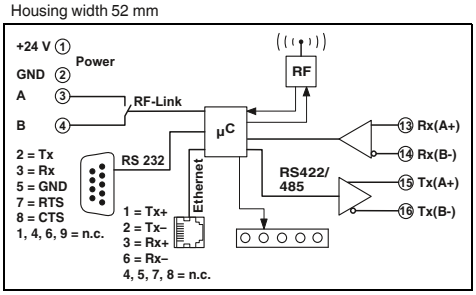
Notes:

The products are offered exclusively for export outside the European Economic Area (EEA).

Wireless transceiver for Ethernet and serial interfaces V.24 (RS-232, RS-422/RS-485)

Ex:

Housing width 52 mm



Technical data

Wireless path			
Direction		Bi-directional	
Frequency range		902 MHz ... 928 MHz	
Transmission power		10 ... 30 dBm	
Serial port		RS-232	RS-485
Connection method		D-SUB-9 socket	COMBICON connector screw terminal block
Serial transmission speed		300 ... 57.6 kbps	
Data format/coding		Asynchronous	
Data flow control/protocols		RTS/CTS	
General data			
Supply voltage		11 V DC ... 30 V DC	
Current consumption		250 mA (at 24 V DC)	
Degree of protection		IP20	
Ambient temperature range		-40 °C ... 65 °C	
Dimensions	W / H / D	52 / 99 / 115 mm	
Screw connection solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Conformance/Approvals			
Conformance		FCC Directive, Part 15.247 ISC Directive RSS 210	
UL, USA/Canada		Class I, Div. 2, Groups A, B, C, D	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Wireless module with optional Ethernet and serial interfaces			
Bus foot for I/O extension modules	**RAD-ISM-900-EN-BD-BUS**	2900017	1
Cannot be extended	**RAD-ISM-900-EN-BD**	2900016	1
without serial ports	**RAD-ISM-900-EN-BD/B**	2901205	1

RAD-Line Ethernet with 400 mW WLAN

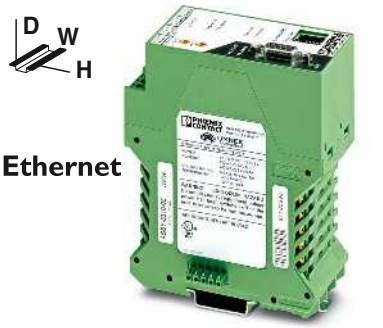
High-power Ethernet industrial wireless radio transceivers that conform to IEEE standard 802.11b/g.

Features:

- Operates in the license-free 2.4 GHz ISM band
- Features a 400 mW industrial radio transceiver
- Selectable 802.11i high security with 128/192/256-bit AES encryption and optional 802.1x authentication
- Supports TCP/IP, UDP and IP v4 protocols
- Individual modules can be configured as point, bridge or client modes using integrated web browser interface
- Bridge mode allows for a network of up to 40 nodes on a single network resulting in a highly reliable network
- Provides an interface for transfer of data between legacy serial devices (RS-232, RS-422, RS-485 interfaces) onto an Ethernet network
- Programmable for point-to-point, point-to-multipoint and multipoint-to-point configurations
- Optional integrated bus foot for connection to RAD-Line extension modules
- Can be used as a Modbus RTU/TCP gateway

Notes:

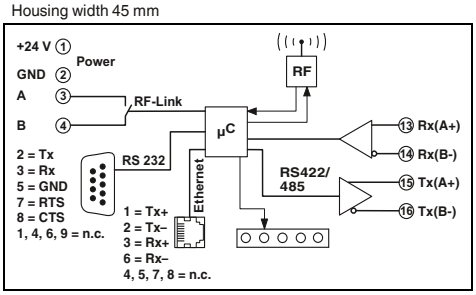
The products are offered exclusively for export outside the European Economic Area (EEA).



WLAN wireless transceiver for Ethernet and serial interfaces (RS-232, RS-422/RS-485), can be extended with I/O extension modules

Ex:

Housing width 45 mm



Technical data

Wireless path			
Direction		Bi-directional	
Frequency range		2.4032 GHz ... 2.4799 GHz	
Transmission power		400 mW	
Serial port		RS-232	RS-485/RS-422
Connection method		D-SUB-9 socket	COMBICON connector screw terminal block
Serial transmission speed		300 ... 57.6 kbps	300 ... 57.6 kbps
Data format/coding		Asynchronous	
Data flow control/protocols		RTS/CTS	
General data			
Supply voltage		12 V DC ... 30 V DC	
Current consumption	typ. / max.	230 mA (24 V DC) / 500 mA (12 V DC)	
Degree of protection		IP20	
Ambient temperature range		-40 °C ... 70 °C	
Dimensions	W / H / D	45 / 99 / 115 mm	
Screw connection solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Conformance/Approvals			
Conformance		FCC Directive, Part 15.247 ISC Directive RSS 210	
UL, USA/Canada		Class I, Div. 2, Groups A, B, C, D	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
WLAN wireless module, high power transceiver with Ethernet and serial interface Bus foot for I/O extension modules	**RAD-80211-XD/HP-BUS**	2900047	1
Cannot be extended	**RAD-80211-XD/HP**	2900046	1

Extension modules

RAD-Line extension modules provide additional inputs and outputs for bi-directional Ethernet wireless systems.

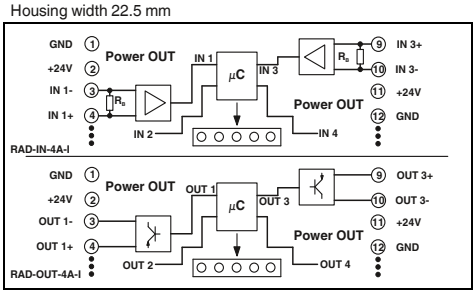
Features:

- Easily installed via an integrated bus foot
- Bus provides power supply voltage
- Data transferred to transceiver module via bus
- Up to 8 modules can be connected to a single transceiver
- A maximum of 33 analog or 66 digital signals can be configured, depending on the selection of modules

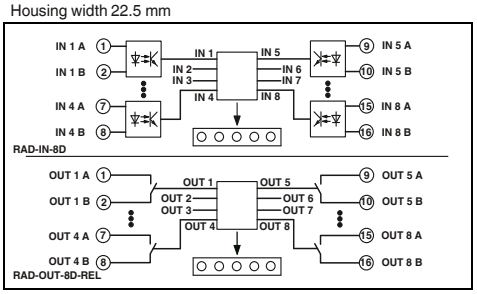
Analog components for 4 inputs or 4 outputs

Digital components for 8 inputs or 8 outputs

Ex:
Housing width 22.5 mm



Ex:
Housing width 22.5 mm



Technical data

Analog input		RAD-IN-4A-I	RAD-OUT-4A-I	RAD-IN-8D	RAD-OUT-8D-REL
Number of inputs		4			
Signal range		4 mA ... 20 mA			
Input resistance		< 170 Ω	-	-	-
Digital input					
Number of inputs				8	
Signal range		-	-	5 V AC/DC ... 30 V AC/DC	-
Switching level	1 signal ("H")	-	-	min. 5 V DC	-
	0 signal ("L")	-	-	max. 1.5 V DC	-
Input frequency				max. 1 Hz	
Pulse length		-	-	-	-
Analog output					
Number of outputs		-	4	-	-
Signal range		-	4 mA ... 20 mA	-	-
Load R_B		-	700 Ω (at U_B = 24 V, R_B = [U_B-10 V] / 20 mA)	-	-
Digital output					
Contact type		-	-	-	8 x Relay output
Switching voltage		-	-	-	30 V AC/DC (EC Declaration of Conformity) 30 V DC (With UL approval) 250 V AC (With UL approval)
Switching current		-	-	-	0.5 A (EC Declaration of Conformity) 2 A (With UL approval)
Clock frequency		-	-	-	-
Frequency output		-	-	-	-
General data					
Supply voltage		9 V DC ... 30 V DC (via bus foot)	9 V DC ... 30 V DC (via bus foot)	9 V DC ... 30 V DC (via bus foot)	9 V DC ... 30 V DC (via bus foot)
Current consumption	Typ./max.	100 mA / 130 mA	100 mA / 130 mA	25 mA / 30 mA	100 mA / 160 mA
Degree of protection		IP20	IP20	IP20	IP20
Ambient temperature range		-20 °C ... 65 °C	-20 °C ... 65 °C	-20 °C ... 65 °C	-20 °C ... 65 °C
Housing material		Polyamide PA non-reinforced	Polyamide PA non-reinforced	Polyamide PA non-reinforced	Polyamide PA non-reinforced
Dimensions	W / H / D	22.5 / 99 / 114.5 mm	22.5 / 99 / 114.5 mm	22.5 / 99 / 114.5 mm	22.5 / 99 / 114.5 mm
Conformance/Approvals					
UL, USA/Canada		Class I, Div. 2, Groups A, B, C, D		Class I, Div. 2, Groups A, B, C, D	

Ordering data

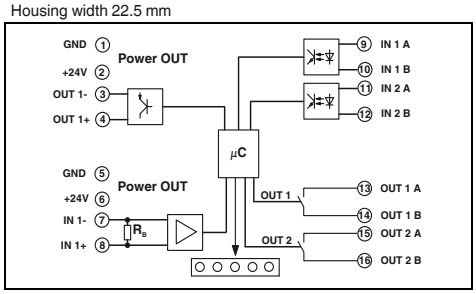
Description		Type	Order No.	Pcs./Pkt.
Extension module	Analog IN	**RAD-IN-4A-I**	2867115	1
Extension module	Analog OUT	**RAD-OUT-4A-I**	2867128	1
Extension module	Digital IN			
Extension module	Digital OUT			
Extension module	Mixed I/O			

Ordering data

Type	Order No.	Pcs./Pkt.
RAD-IN-8D	2867144	1
RAD-OUT-8D-REL	2867157	1

Analog/digital module
for 2 digital inputs/outputs
and 1 analog input/output

Ex:
Housing width 22.5 mm

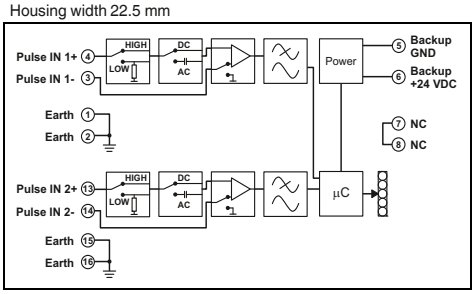


Technical data	
1	
4 mA ... 20 mA	
< 170 Ω	
2	
5 V AC/DC ... 30 V AC/DC	
min. 5 V DC	
max. 1.5 V DC	
-	
1	
4 mA ... 20 mA	
700 Ω (at U_B = 24 V, R_B = [U_B-10 V] / 20 mA)	
2 x Relay output	
30 V AC/DC (EC Declaration of Conformity)	
30 V DC (With UL approval)	
250 V AC (With UL approval)	
0.5 A (EC Declaration of Conformity)	
2 A (With UL approval)	
-	
-	
9 V DC ... 30 V DC (via bus foot)	
70 mA / 110 mA	
IP20	
-20 °C ... 65 °C	
Polyamide PA non-reinforced	
22.5 / 99 / 114.5 mm	
Class I, Div. 2, Groups A, B, C, D	

Ordering data		
Type	**Order No.**	Pcs./Pkt.
RAD-IN+OUT-2D-1A-I	2867322	1

Digital module
for two counter/frequency inputs

Ex:
Housing width 22.5 mm

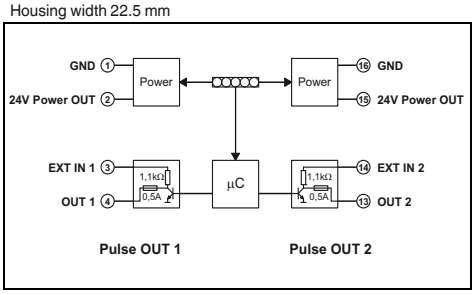


Technical data	
-	
2	
0.1 V AC/DC ... 30 V AC/DC	
Common mode 3.6 V DC / Differential mode 100 mV_{PP}	
-	
0.1 Hz ... 10 kHz (50 % duty cycle)	
High time 50 µs	
-	
-	
-	
-	
-	
-	
-	
9 V DC ... 30 V DC (via bus foot)	
35 mA / 45 mA	
IP20	
-20 °C ... 65 °C	
Polyamide PA non-reinforced	
22.5 / 99 / 114.5 mm	
Class I, Div. 2, Groups A, B, C, D	

Ordering data		
Type	**Order No.**	Pcs./Pkt.
RAD-IN-2D-CNT	2885223	1

Digital module
for two counter/frequency outputs

Ex:
Housing width 22.5 mm



Technical data	
-	
-	
-	
-	
-	
-	
-	
Transistor output, passive	
-	
approx. 27 mA (Terminal 3/14)	
approx. 25 mA (Terminal 4/13)	
High Speed 10 kHz with 50 % duty cycle	
Low speed 10 Hz with 50 % duty cycle	
0.1 Hz ... 10 kHz (50 % duty cycle)	
9 V DC ... 30 V DC (via bus foot)	
90 mA / 115 mA	
IP20	
-20 °C ... 65 °C	
Polyamide PA non-reinforced	
22.5 / 99 / 114.5 mm	
Class I, Div. 2, Groups A, B, C, D	

Ordering data		
Type	**Order No.**	Pcs./Pkt.
RAD-OUT-2D-CNT	2885236	1

2.4 GHz/5 GHz accessories

Omnidirectional antennas

Omnidirectional antennas to increase gain.

– Standard omnidirectional antennas

Gain 2 dBi (2.4 GHz)

Gain 2.5 dBi (2.4 GHz)/5 dBi (5 GHz)

	Technical data	Technical data
General data		
Ambient temperature (operation)	-20 °C ... 65 °C	-40 °C ... 70 °C
Degree of protection	IP65	IP68
Gain	2 dBi	2.5 dBi (2.4 GHz)
	-	5 dBi (5 GHz)
Impedance	50 Ω	50 Ω
Horizontal / vertical apex angle	360 ° / 75 °	360 ° / 30 ° (At 2.4 GHz)
		360 ° / 16 ° (At 5 GHz)
Dimensions W / H	7.8 mm / 82.5 mm	23 mm / 180 mm
Frequency range	2.4 GHz	2.4 GHz ... 2.5 GHz / 5.15 GHz ... 5.83 GHz
Scope of delivery	Incl. mounting material	-

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Omnidirectional antenna						
With connection RSMA (male)	**RAD-ISM-2400-ANT-OMNI-2-1-RSMA**	2701362	1			
With N connection (male)				**ANT-OMNI-2459-02**	2701408	1

2.4 GHz/5 GHz accessories

Omnidirectional antennas

Omnidirectional antennas to increase gain.

– With vandalism protection thanks to increased impact strength

Gain 3 dBi (2.4 GHz)

Dual band,
gain up to 6 dBi (2.4 GHz)/up to 8 dBi (5 GHz)

	Technical data	Technical data
General data		
Ambient temperature (operation)	-40 °C ... 80 °C	-40 °C ... 80 °C
Degree of protection	IP55	IP68
Gain	3 dBi	6 dBi (2.4 GHz, when mounted on metal surface)
	-	8 dBi (5.6 GHz, when mounted on metal surface)
Impedance	50 Ω	50 Ω
Horizontal / vertical apex angle	360 ° / 85 °	360 ° / -
Dimensions W / H	86 mm / 43 mm	92 mm / 51 mm
Frequency range	2.4 GHz	2.4 GHz / 5.15 GHz ... 5.83 GHz

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
OMNI omnidirectional antenna with protection against vandals						
With connection RSMA (male)	**RAD-ISM-2400-ANT-VAN-3-0-RSMA**	2701358	1			
With connection N (female)				**RAD-ISM-2459-ANT-FOOD-6-0-N**	2702898	1
Mounting material for wall mounting	**RAD-ANT-VAN-MKT**	2885870	1			

2.4 GHz/5 GHz accessories

Omnidirectional antennas

Omnidirectional antennas to increase gain.

– High-quality omnidirectional antennas for wall and mast mounting

Gain 6 dBi (2.4 GHz)

Gain 5 dBi (5 GHz)

	Technical data	Technical data
General data		
Ambient temperature (operation)	-40 °C ... 75 °C	-45 °C ... 70 °C
Degree of protection	IP67	IP64
Gain	6 dBi	5 dBi
Impedance	50 Ω	50 Ω
Horizontal / vertical apex angle	360 ° / 30 °	360 ° / 25 °
Dimensions W / H	22 mm / 250 mm	16 mm / 130 mm
Frequency range	2.4 GHz ... 2.5 GHz	5.15 GHz ... 5.875 GHz
Scope of delivery	Incl. mounting material	Incl. mounting material

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Omnidirectional antenna						
With connection N (female)	**RAD-ISM-2400-ANT-OMNI-6-0**	2885919	1	**ANT-OMNI-5900-01**	2701347	1

2.4 GHz/5 GHz accessories

Directional wireless antennas

Directional wireless antennas with high gain for transmission over longer distances.

– For wall or mast mounting

Gain: 9 dBi (2.4 GHz / 5 GHz)

Gain: 19 dBi (2.4 GHz)

	Technical data		Technical data
General data	ANT-DIR-2459-01	ANT-DIR-5900-01	
Ambient temperature (operation)	-40 °C ... 75 °C	-40 °C ... 80 °C	-40 °C ... 70 °C
Degree of protection	IP67	IP67	IP65
Gain	9 dBi	9 dBi	19 dBi
Impedance	50 Ω	50 Ω	50 Ω
Horizontal / vertical apex angle	75 ° / 55 ° (At 2.4 GHz) 55 ° / 55 ° (At 5 GHz)	70 ° / 60 ° (At 5 GHz) -	17 ° / 11 °
Dimensions W / H	80 mm / 101 mm	80 mm / 101 mm	610 mm / 419 mm
Frequency range	2.4 GHz ... 2.5 GHz / 5.15 GHz ... 5.875 GHz	5.15 GHz ... 5.875 GHz	2.4 GHz
Scope of delivery	Incl. mounting material	Incl. mounting material	Incl. mounting material

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Panel directional wireless antenna (without cable)						
With connection N (female), dual band	**ANT-DIR-2459-01**	2701186	1			
With connection N (female), 2 emitters	**ANT-DIR-5900-01**	2701348	1			
Parabolic antenna						
With connection N (female)				**RAD-ISM-2400-ANT-PAR-19-0**	2867885	1

868 MHz/900 MHz accessories

Omnidirectional antennas
– For wall or mast mounting

Gain: 4 dBi (868 MHz)

Gain: 2 dBi (868/900 MHz)

	Technical data	Technical data
General data		
Ambient temperature (operation)	-40 °C ... 75 °C	-40 °C ... 70 °C
Degree of protection	IP67	IP66
Gain	4 dBi	2.15 dBi
Impedance	50 Ω	50 Ω
Connection method	N (female)	Type N (female)
Horizontal / vertical apex angle	360 ° / 30 °	360 ° / 50 °
Dimensions W / H	20 mm / 620 mm	36 mm / 84 mm
Frequency range	868 MHz ... 870 MHz	868 MHz ... 960 MHz
Scope of delivery	Incl. mounting material	-

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Omnidirectional antenna	**ANT-OMNI-868-01**	2702136	1	**RAD-900-ANT-OMNI-2-N**	2904802	1

868 MHz/900 MHz accessories

Directional wireless antennas
– For wall or mast mounting

Gain: 3.5 dBi (868 MHz)
Circular polarized

Yagi directional antenna,
up to 12 dBi gain (868/900 MHz)

	Technical data	Technical data	
General data		...-YAGI-6.5-N	...-YAGI-10-N
Ambient temperature (operation)	-40 °C ... 75 °C	-40 °C ... 80 °C	-40 °C ... 80 °C
Degree of protection	IP67	IP65	IP65
Gain	3.5 dBi	8.5 dBi	12.15 dBi
Impedance	50 Ω	50 Ω	50 Ω
Connection method	N (female)	N (female) with cable (0.6 m)	N (female) with cable (0.6 m)
Horizontal / vertical apex angle	135 ° / 90 °	100 ° / 62 °	56 ° / 46 °
Dimensions W / H	80 mm / 101 mm	60.5 mm / 172 mm	60.5 mm / 172 mm
Frequency range	865 MHz ... 870 MHz	868 MHz ... 960 MHz	868 MHz ... 960 MHz
Scope of delivery	Incl. mounting material	Incl. mounting material	Incl. mounting material

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Panel directional wireless antenna (without cable)	**ANT-DIR-868-01**	2702137	1			
Directional wireless antenna				**RAD-ISM-900-ANT-YAGI-6.5-N**	2867814	1
				RAD-ISM-900-ANT-YAGI-10-N	5606614	1

Antenna cable

– Various cables for connection of different antennas
– Frequency range: 900 MHz ... 5 GHz

Antenna adapter cable, N (male) -> RSMA (male)

Antenna extension cable

	Technical data	Technical data
General data		
Ambient temperature range	-40 °C ... 85 °C	-40 °C ... 105 °C
Impedance	50 Ω	50 Ω

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Antenna adapter cable						
0.5 m long	**RAD-PIG-RSMA/N-0.5**	2903263	1			
1 m long	**RAD-PIG-RSMA/N-1**	2903264	1			
2 m long	**RAD-PIG-RSMA/N-2**	2903265	1			
3 m long	**RAD-PIG-RSMA/N-3**	2903266	1			
5 m long	**RAD-PIG-RSMA/N-5**	2702140	1			
Antenna extension cable						
3 m long, N connection at both ends (male)				**RAD-CAB-EF393- 3M**	2867649	1
5 m long, N connection at both ends (male)				**RAD-CAB-EF393- 5M**	2867652	1
10 m long, N connection at both ends (male)				**RAD-CAB-EF393-10M**	2867665	1
15 m long, N connection at both ends (male)				**RAD-CAB-EF393-15M**	2885634	1

Accessories
Adapter/extension cables

– Extension or adaptation of wireless module for antenna
– Frequency range: 900 MHz ... 5 GHz

Panel feed-through

	Technical data	Technical data
General data		
Ambient temperature range	-40 °C ... 105 °C	-40 °C ... 70 °C
Impedance	50 Ω	50 Ω

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Antenna cable						
50 cm long, N (male) -> N (male)	**FL LCX PIG-EF142-N-N**	2700677	1			
Antenna adapter cable						
50 cm long, N (female) -> RSMA (male)				**RAD-PIG-EF316-N-RSMA**	2701402	1

Accessories

Surge protection

– For installing the antenna outside buildings from a cable length of 3 m

Antenna surge protection

Surge protective device for coaxial lines

	Technical data	Technical data
General data		
Ambient temperature range	-40 °C ... 90 °C	-40 °C ... 90 °C
Degree of protection	-	IP68
Attenuation	typ. 0.05 dB (≤ 0.15 dB)	0.1 dB (≤ 6 GHz)
Frequency range	2.4 GHz ... 5.9 GHz	0 Hz ... 6 GHz

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
COAXTRAB, protective adapter for antenna connections with Lambda/4 technology, 2.4 to 5.9 GHz						
Socket-socket	**CN-LAMBDA/4-5.9-BB**	2838490	1			
Male/female	**CN-LAMBDA/4-5.9-SB**	2800023	1			
COAXTRAB, protective adapter for coaxial cable systems, DC to 6 GHz						
Socket-socket				**CN-UB-70DC-6-BB**	2803166	1
Plug/socket				**CN-UB-70DC-6-SB**	2803153	1

Adapter

– For installing the antenna inside buildings

Sealing tape

– Provides additional weather protection for adapters, splitters, cable connections, etc.
– Self-vulcanizing

Adapter

Sealing tape

	Technical data	Technical data
General data		
Ambient temperature range	-65 °C ... 165 °C	-40 °C ... 90 °C
Degree of protection	IP20	-
Impedance	50 Ω	-
Features	-	Self-vulcanizing
Width	-	19 mm
Length	-	3 m
Thickness	-	0.75 mm

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Adapter						
N (female) -> N (female)	**RAD-ADP-N/F-N/F**	2867843	1			
Weather protection tape						
				RAD-TAPE-SV-19-3	2903182	1

Accessories

Antenna barrier

– For the safe use of standard antennas in the ex area

The antenna barrier limits the ignition energy at the antenna connection in an intrinsically safe way according to protection type Ex i. Standard antennas can therefore be used up to Ex zone 0.

for installation in Ex Zone 1

for installation in Ex Zone 2

	Technical data	Technical data
General data		
Ambient temperature range	-40 °C ... 75 °C	-40 °C ... 75 °C
Degree of protection	IP66	IP65
Frequency range	25 MHz ... 6000 MHz	700 MHz ... 6000 MHz
Conformance/Approvals		
ATEX	Ex II 2(1)G, Ex d mb [ia] IIC	Ex I (M1) [Ex ia Ma] I Ex II (1) G [Ex ia Ga] IIC Ex II (1) D [Ex ia Da] IIIC Ex II 3 (1) G Ex nA [ia Ga] IIC T6 Gc X Please follow the special installation instructions in the documentation!
IECEx	-	[Ex ia Ma] I [Ex ia Ga] IIC [Ex ia Da] IIIC Ex nA [ia Ga] IIC T6 Gc X

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Antenna barrier 76 cm long, N (female) -> RSMA (male) N (female) -> N (female)	**RAD-PIG-RSMA-N-EX/ATEX**	2904788	1	**BAR-ANT-N-N-EX**	2702198	1

Accessories

Antenna splitter

– For splitting HF signals between two antennas
– For connecting two directional antennas for repeater applications
– Use the FL LCX PIG-EF142-N-N antenna cable to connect two directional antennas

Antenna splitter

	Technical data
General data	
Ambient temperature range	-40 °C ... 100 °C
Degree of protection	IP65, when installed
Frequency range	0 Hz ... 11 GHz

	Ordering data		
Description	Type	Order No.	Pcs./Pkt.
Antenna splitter	**RAD-SPL-2-N/N**	2702293	1
Antenna cable 50 cm long, N (male) -> N (male)	**FL LCX PIG-EF142-N-N**	2700677	1

Leaky wave cable and accessories

new

The leaky wave cable is a cable that acts as an antenna, which emits continuously along its length. It ensures a continuous wireless connection when using track-guided systems, even in angled or difficult to reach spaces.

Leaky wave cable

new

Planing tool and cable tie

Technical data

General data		
Ambient temperature (operation)	-40 °C ... 85 °C	-
Cable, attenuation	14.7 dB/100 m, longitudinal attenuation (2.4 GHz)	-
Connection method	open end	-

Ordering data

Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Leaky wave cables						
- 2.4 GHz frequency band	**FL LCX CABLE 24 E**	2702553	1			
- 5 GHz frequency band	**FL LCX CABLE 5 E**	2702860	1			
Connectors for leaky wave cable	**FL LCX CON-N-F E**	2702518	1			
Termination resistor						
- for leaky wave cable, N (male)	**FL LCX 50-OHM**	2884978	1			
- For device, RSMA (male)	**FL LCX 50-OHM-RSMA**	2702702	1			
Alignment tool for leaky wave cable				**FL LCX TOOL E**	2702519	1
Cable tie for leaky wave cable				**FL LCX CLAMP E**	2702520	100

Control box sets

Control box set for the FL WLAN 5100 access point for use directly in industrial environments or in protected outdoor areas.

Features:

– IP66 control box
– Mounting suitable for industrial use
– Bore holes, screw connections already included
– Various sets, suitable for the most common applications

Technical data

General data		
Dimensions	W / H / D	174 mm / 254 mm / 137 mm

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Control cabinet set, IP66, including DIN rail, plugs, and screw connections			
	FL RUGGED BOX	2701204	1
- With 3 omnidirectional antennas and antenna cables	**FL RUGGED BOX OMNI-1**	2701430	1
- With 3 omnidirectional antennas, antenna cables, and 100 ... 240 V AC power supply	**FL RUGGED BOX OMNI-2**	2701439	1
- With one directional antenna, antenna cables, and 100 ... 240 V AC power supply	**FL RUGGED BOX DIR-1**	2701440	1

Accessories

Set for mast mounting of the FL RUGGED BOX housing, including screw clamps for masts up to 89 mm in diameter	**FL RUGGED BOX POLE SET**	2701205	1

900 MHz accessories

Omnidirectional antennas

– Mobile or stationary applications
– Point-to-multipoint configurations
– Small antennas are suitable for applications with a shorter range
– Large antennas are suitable for applications requiring longer range

2.15 dBi/7 dBi gain

5 dBi/8 dBi gain

Technical data			Technical data	
General data	...-OMNI-0-6 / ...-OMNI-2-2-...	...-OMNI-5	...-OMNI-FG-3-N	...-OMNI-FG-6-N
Ambient temperature (operation)	-40 °C ... 75 °C	-40 °C ... 80 °C	-40 °C ... 80 °C	-40 °C ... 80 °C
Degree of protection	IP65	IP65	IP65	IP65
Gain	2.15 dBi	7 dBi	5.15 dBi	8 dBi
Impedance	50 Ω	50 Ω	50 Ω	50 Ω
Horizontal / vertical apex angle	360 ° / N/A	360 ° / 30 °	360 ° / 28 °	360 ° / 15 °
Dimensions W / H	0.3 cm / 8.9 cm	0.3 cm / 60.9 cm	2.38 in. / 44.25 in.	6.05 cm / 180.34 cm
Frequency range	900 MHz	900 MHz	902 MHz ... 928 MHz	900 MHz
Scope of delivery	Incl. mounting material	Incl. mounting material	Incl. mounting material	Incl. mounting material

Ordering data				Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Omnidirectional antenna						
With connection MCX (male)	**RAD-ISM-900-ANT-OMNI-0-6**	2867160	1			
With connection RSMA (male)	**RAD-900-ANT-OMNI-2-2-RSMA**	2904801	1			
With connection N (female)	**RAD-ISM-900-ANT-OMNI-5**	2867199	1	**RAD-ISM-900-ANT-OMNI-FG-3-N**	2867791	1
With connection N (female)				**RAD-ISM-900-ANT-OMNI-FG-6-N**	2885579	1

900 MHz accessories

Directional wireless antennas (YAGI)

– Stationary applications
– Point-to-point configurations for line of sight

5 dBi gain,
with 0.6 m connecting cable

8.5 dBi/12 dBi gain,
with 0.6 m connecting cable

Technical data		Technical data	
General data		...-YAGI-6.5-N	...-YAGI-10-N
Ambient temperature (operation)	-40 °C ... 80 °C	-40 °C ... 80 °C	-40 °C ... 80 °C
Degree of protection	IP65	IP65	IP65
Gain	5 dBi	8.5 dBi	12.15 dBi
Impedance	50 Ω	50 Ω	50 Ω
Connection method	N (female) with cable (0.6 m)	N (female) with cable (0.6 m)	N (female) with cable (0.6 m)
Horizontal / vertical apex angle	168 ° / 78 °	100 ° / 62 °	56 ° / 46 °
Dimensions W / H	6 cm / 17 cm	60.5 mm / 172 mm	60.5 mm / 172 mm
Frequency range	900 MHz	868 MHz ... 960 MHz	868 MHz ... 960 MHz
Scope of delivery	Incl. mounting material	Incl. mounting material	Incl. mounting material

Ordering data				Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Directional wireless antenna						
	RAD-ISM-900-ANT-YAGI-3-N	2867801	1	**RAD-ISM-900-ANT-YAGI-6.5-N**	2867814	1
				RAD-ISM-900-ANT-YAGI-10-N	5606614	1

Antenna cable

– Various cables for connection of different antennas
– Frequency range: 900 MHz ... 5 GHz

Antenna adapter cable, N (male) -> RSMA (male)

Technical data	
General data	
Ambient temperature range	-40 °C ... 85 °C
Impedance	50 Ω

Ordering data			
Description	Type	Order No.	Pcs./Pkt.
Antenna adapter cable			
0.5 m long	**RAD-PIG-RSMA/N-0.5**	2903263	1
1 m long	**RAD-PIG-RSMA/N-1**	2903264	1
2 m long	**RAD-PIG-RSMA/N-2**	2903265	1
3 m long	**RAD-PIG-RSMA/N-3**	2903266	1
5 m long	**RAD-PIG-RSMA/N-5**	2702140	1

Antenna cable

– Various cables for connection of different antennas
– Frequency range: 900 MHz ... 5 GHz

Technical data		Technical data	
General data			
Ambient temperature range	-40 °C ... 75 °C	-40 °C ... 75 °C	
Attenuation	0.89 dB/m	0.6 dB @ 900 MHz	
Impedance	50 Ω	50 Ω	
Conformance/Approvals			
UL, USA/Canada	-	Class I, Div. 1, 2, Groups A, B, C, D Class II, Div. 1, 2, Groups F, G	

Ordering data				Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Antenna adapter cable						
1.2 m long, MCX (male) -> N (female)	**RAD-CON-MCX-N-SB**	2867717	1			
1.2 m long, 90° MCX (male) -> N (female)	**RAD-CON-MCX90-N-SS**	2885207	1			
1.2 m long, SMA (male) -> N (female)	**RAD-CON-SMA-N-SS**	2867403	1			
30 cm long, MCX (male) -> MCX (male)	**RAD-CON-MCX-MCX-SS**	2867607	1			
Antenna adapter cable for Ex-zone 1						
90 cm long, MCX (male) -> RPSMA (male)				**RAD-CON-MCX-RPSMA-EX**	2885621	1

Extension cable

– Various cables to extend distance between the radio and antenna

Antenna extension cable, N (male)

Technical data

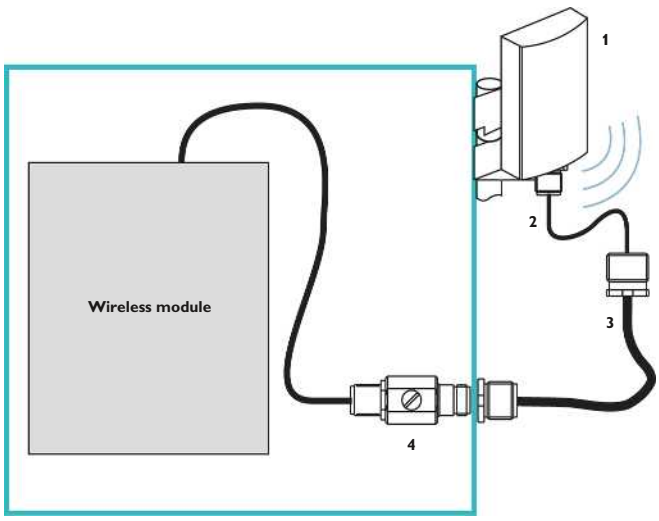
General data	
Ambient temperature range	-40 °C ... 85 °C
Impedance	50 Ω

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Antenna extension cable, N connection at both ends (male)			
3 m long, attenuation (at 900 MHz) 0.96 dB	**RAD-CAB-PFP240-10**	5606124	1
6 m long, attenuation (at 900 MHz) 0.98 dB	**RAD-CAB-PFP400-20**	5606125	1
7.5 m long, attenuation (at 900 MHz) 1 dB	**RAD-CAB-PFP500-25**	5606126	1
12 m long, attenuation (at 900 MHz) 0.25 dB/m	**RAD-CAB-RG213-40**	2867377	1
15 m long, attenuation (at 900 MHz) 0.25 dB/m	**RAD-CAB-RG213-50**	2867225	1
18 m long, attenuation (at 900 MHz) 0.13 dB/m	**RAD-CAB-PFP400-60**	2867380	1
24 m long, attenuation (at 900 MHz) 0.13 dB/m	**RAD-CAB-PFP400-80**	2867393	1
30 m long, attenuation (at 900 MHz) 0.13 dB/m	**RAD-CAB-PFP400-100**	2867238	1
45 m long, attenuation (at 900 MHz) 0.08 dB/m	**RAD-CAB-PFP600-150**	2885184	1

Control cabinet/switch box

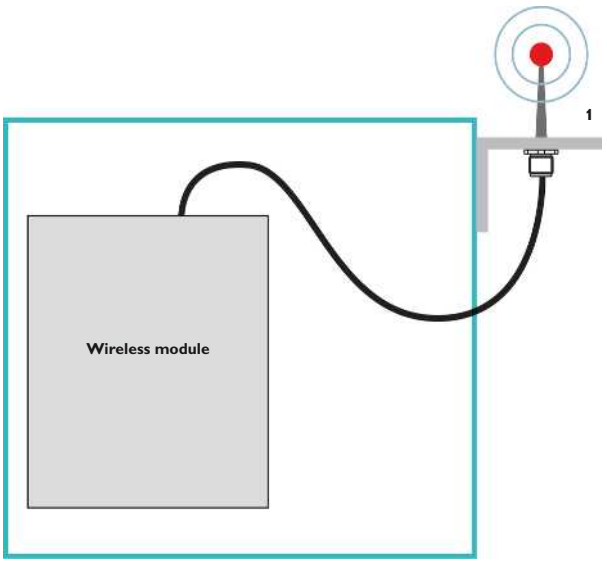
– For antennas with extension cable, with surge protection



1 Antenna
2 Antenna adapter cable (pigtail)
3 Antenna extension cable
4 Surge protection

Control cabinet/switch box

– For antennas without extension cable, without surge protection



Lighting and signaling

The LED lights, signal lights, and signal towers from Phoenix Contact are highly efficient, durable, and maintenance-free. They therefore represent the perfect solution for optimum application lighting and clear status signaling.

LED enclosure lights

Optimum illumination of the control cabinet ensures fast troubleshooting and wiring errors can be avoided. The LED enclosure lights in the PLD (Phoenix Contact Lighting Devices) product range provide optimum illumination inside your control cabinets right down to the bottom. Thanks to tool-free mounting, the lights can be mounted in no time at all.

LED machine lights

The LED machine lights from the PLD (Phoenix Contact Lighting Devices) product range illuminate your machines efficiently, homogeneously, and without glare. Select your machine lights from the comprehensive range: tailored to your application in terms of size, length, degree of protection, and beam angle.

LED tower lighting

The LED lights illuminate towers and shafts reliably and efficiently.

LED signal lights

With the robust LED signal lights, you can design reliable and energy-efficient signaling systems for maritime use, e.g., for locks, bridges or ports.

LED signal towers

Thanks to the considerable signal diversity of the modular signal towers in the PSD (Phoenix Contact Signaling Devices) product range, you can implement unambiguous signaling of your machine and system states. This reduces downtimes and avoids unnecessary costs.

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Product overview

Enclosure lights

Class 400 LED enclosure lights
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Plug-in power supply for class 400 LED enclosure lights
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Class 600 LED enclosure lights
- With motion detector
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Class 600 LED enclosure lights
- With motion detector and socket
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Machine lights

Class 100 LED machine lights
Width 23 mm, degree of protection IP67
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Class 200 LED machine lights
Ø 40 mm, degree of protection IP67
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Class 200 LED machine lights
Ø 70 mm, degree of protection IP67
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Class 200 LED machine lights
Length 284 mm, degree of protection IP69
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Tower lights

LED tower lighting
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Signal lights

LED signal lights
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Signal towers

Optical signal elements
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Audible signal elements
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Voice output element
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Connection and mounting elements
- For surface and tube mounting
Page 504

Class 400 LED enclosure lights

These LED lights are intended for use inside a control cabinet and provide optimum and efficient illumination right down to the bottom of the cabinet.

Thanks to the various lengths and swivelable light emission window, the lights can be adapted to different control cabinet widths and heights as well as to the depth of the control cabinet plate.

Your advantages

- Tool-free mounting, thanks to clip fastening
- Series connection reduces cabling effort for control cabinets arranged in series
- Optimum lighting of the control cabinet, thanks to integrated prismatics and capacity to swivel
- LED service life of 50,000 h (L70 value) prevents bulb replacement

Length 250 mm / 375 mm / 375 mm

Technical data

	PLD...250	PLD...375	PLD...500
Power supply for module electronics			
Supply voltage		24 V DC	
Power consumption	1.5 W	3 W	5 W
Light properties			
Source of light type		LED	
Service life, lighting appliance		50,000 h (L70)	
Number of LEDs	5	12	20
Color temperature		5000 K	
Color rendering index		75	
Net luminous flux	140 lm	340 lm	560 lm
General data			
Connection method		M8 connector (snap-in)	
Weight	120 g	170 g	220 g
Protection class		III	
Degree of protection		IP20	
Width		23 mm	
Height		38 mm	
Length	250 mm	375 mm	500 mm
Mounting position		any	
Ambient temperature (operation)		-25 °C ... 60 °C	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
LED enclosure light			
- Length: 250 mm	**PLD E 400 W 250**	2702221	1
- Length: 375 mm	**PLD E 400 W 375**	2702222	1
- Length: 500 mm	**PLD E 400 W 500**	2702223	1

Accessories

Mounting set, with magnets	**PLD E 400-ME MM**	2702312	1
Mounting set, with screws and washers	**PLD E 400-ME SM**	2702313	1
Mounting set (replacement part), with clip retainers	**PLD E 400-ME CM**	2702314	1
Sensor/actuator cable, 3 m, open cable end with ferrules	**SAC-3P- 3,0-PUR/M 8SIFS AE**	1417698	1
Sensor/actuator cable, 0.6 m	**SAC-3P-M 8MS/ 0,6-PUR/M 8SIFS**	1417699	1
Sensor/actuator cable, 1 m	**SAC-3P-M 8MS/ 1,0-PUR/M 8SIFS**	1417700	1
Sensor/actuator cable, 3 m	**SAC-3P-M 8MS/ 3,0-PUR/M 8SIFS**	1417701	1
Door position switch, 3 m cable with open cable end, 0.6 m cable with M8 socket	**PLD E 400-DS-3,0/FS/0,6**	2702336	1
Door position switch, 1 m cable with M8 connector, 0.6 m cable with M8 socket	**PLD E 400-DS-MS/1,0-FS/0,6**	2702337	1
Plug-in power supply 12 W, with adapter for EU, GB, US, AU	**PLD E 400-PS/1AC/24DC/12W**	2702435	1
Plug-in power supply 30 W, with adapter for EU, GB, US, AU	**PLD E 400-PS/1AC/24DC/30W**	2702436	1

Class 600 LED enclosure lights

These LED lights are intended for use inside a control cabinet and provide optimum and efficient illumination right down to the bottom of the cabinet.

Thanks to the integrated motion detector and integrated socket, you can save cabling material and cabling time.

Your advantages

- Tool-free mounting, thanks to the patented snap-in hook system
- Worldwide use, thanks to AC wide range input
- Integrated motion detector saves on MRP and installation costs for door position switches
- Socket enables the operation of external devices even when power is disconnected to the control cabinet
- Series connection reduces cabling effort for control cabinets arranged in series
- Optimum lighting of the control cabinet, thanks to integrated optics
- LED service life of 50,000 h (L70 value) prevents bulb replacement

Length: 265 mm

Technical data

Power supply for module electronics	
Supply voltage range	85 V AC ... 265 V AC (50/60 Hz)
Power consumption	9.8 W
Light properties	
Source of light type	LED
Service life, lighting appliance	50,000 h (L70)
Number of LEDs	23
Color temperature	4000 K
Color rendering index	85
Net luminous flux	685 lm
General data	
Connection method	Installation coupler
Weight	650 g
Protection class	I
Degree of protection	IP20
Width	91 mm
Height	44 mm
Length	265 mm
Mounting position	any
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs./Pkt.
LED enclosure light, with motion detector			
- Length: 265 mm	**PLD E 608 W 265**	2702224	1
LED enclosure light, with motion detector and socket			
- Length: 315 mm, with type F socket (CEE 7/4)			
- Length: 315 mm, with type E socket (CEE 7/5)			
- Length: 315 mm, with type B socket (NEMA 5-15)			

Accessories

Mounting set, with magnets	**PLD E 608-ME MM**	2702315	1
Mounting set, with screws and washers	**PLD E 608-ME SM**	2702316	1
Mounting set (replacement part), mounting carriage with snap-in hooks	**PLD E 608-ME SFM**	2702317	1
Connector, for series connection, black, 3-pos.	**PLD E 608-CO-MS**	2702308	5
Socket, for power supply and series connection, black, 3-pos.	**PLD E 608-CO-FS**	2702309	5
T-distributor, with 2 sockets and one connector for series connection, black, 3-pos.	**PLD E 608-CO-MS/FS/FR**	2702310	5
Cable, for connecting to the supply voltage, 3 m long	**PLD E 608-CA-3,0/FS AM**	2702302	1
Cable for series connection, 0.6 m long	**PLD E 608-CA-MS/0,6/FS AM**	2702303	1
Cable for series connection, 1 m long	**PLD E 608-CA-MS/1,0/FS AM**	2702304	1
Cable for series connection, 4 m long	**PLD E 608-CA-MS/4,0/FS AM**	2702305	1
Cable, for connecting to the supply voltage, 3 m long, with UL approval	**PLD E 608-CA-3,0/FS/UL**	2702306	1
Cable for series connection, 0.6 m long, with UL approval	**PLD E 608-CA-MS/0,6/FS/UL**	2702307	1

**Length: 315 mm,
type F socket (CEE 7/4)**

**Length: 315 mm,
type E socket (CEE 7/5)**

**Length: 315 mm,
type B socket (NAMA 5-15)**

Technical data		
85 V AC ... 265 V AC (50/60 Hz)	85 V AC ... 265 V AC (50/60 Hz)	100 V AC ... 125 V AC (50/60 Hz)
9.8 W	9.8 W	9.8 W
LED	LED	LED
50,000 h (L70)	50,000 h (L70)	50,000 h (L70)
23	23	23
4000 K	4000 K	4000 K
85	85	85
685 lm	685 lm	685 lm
Installation coupler	Installation coupler	Installation coupler
770 g	770 g	770 g
I	I	I
IP20	IP20	IP20
91 mm	91 mm	91 mm
44 mm	44 mm	44 mm
315.4 mm	315.4 mm	315.4 mm
any	any	any
-25 °C ... 60 °C	-25 °C ... 60 °C	-25 °C ... 60 °C

Ordering data								
Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
PLD E 608 W 315/F	2702226	1	**PLD E 608 W 315/E**	2702228	1	**PLD E 608 W 315/B**	2702227	1
Accessories			**Accessories**			**Accessories**		
PLD E 608-ME MM	2702315	1	**PLD E 608-ME MM**	2702315	1	**PLD E 608-ME MM**	2702315	1
PLD E 608-ME SM	2702316	1	**PLD E 608-ME SM**	2702316	1	**PLD E 608-ME SM**	2702316	1
PLD E 608-ME SFM	2702317	1	**PLD E 608-ME SFM**	2702317	1	**PLD E 608-ME SFM**	2702317	1
PLD E 608-CO-MS	2702308	5	**PLD E 608-CO-MS**	2702308	5	**PLD E 608-CO-MS**	2702308	5
PLD E 608-CO-FS	2702309	5	**PLD E 608-CO-FS**	2702309	5	**PLD E 608-CO-FS**	2702309	5
PLD E 608-CO-MS/FS/FR	2702310	5	**PLD E 608-CO-MS/FS/FR**	2702310	5	**PLD E 608-CO-MS/FS/FR**	2702310	5
PLD E 608-CA-3,0/FS AM	2702302	1	**PLD E 608-CA-3,0/FS AM**	2702302	1	**PLD E 608-CA-3,0/FS AM**	2702302	1
PLD E 608-CA-MS/0,6/FS AM	2702303	1	**PLD E 608-CA-MS/0,6/FS AM**	2702303	1	**PLD E 608-CA-MS/0,6/FS AM**	2702303	1
PLD E 608-CA-MS/1,0/FS AM	2702304	1	**PLD E 608-CA-MS/1,0/FS AM**	2702304	1	**PLD E 608-CA-MS/1,0/FS AM**	2702304	1
PLD E 608-CA-MS/4,0/FS AM	2702305	1	**PLD E 608-CA-MS/4,0/FS AM**	2702305	1	**PLD E 608-CA-MS/4,0/FS AM**	2702305	1
						PLD E 608-CA-3,0/FS/UL	2702306	1
						PLD E 608-CA-MS/0,6/FS/UL	2702307	1

Class 100 LED machine lights

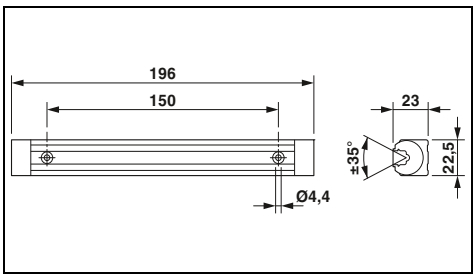
These LED lights are designed for use inside machinery. They provide surface illumination of the interior of the machine.

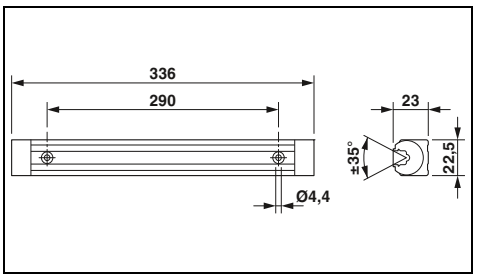
Your advantages

- Narrow design enables mounting even in confined spaces
- Ready to connect by means of punched-on 3 m supply line
- Focused illumination, thanks to swivel action
- IP67 protection enables use even in wet environments
- ETL approval permits use on the North American market
- Particularly economical thanks to energy-efficient LED technology and an LED service life of at least 50,000 h

Length 196 mm

Length 336 mm





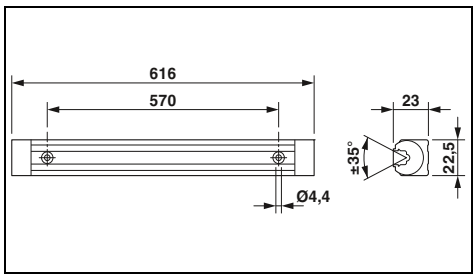
	Technical data	Technical data
Power supply for module electronics		
Supply voltage	24 V DC	24 V DC
Supply voltage range	22 V DC ... 29 V DC	22 V DC ... 29 V DC
Current consumption	typ. 0.15 A (at 24 V DC)	typ. 0.3 A (at 24 V DC)
Power consumption	approx. 3.5 W (at 24 V DC)	approx. 7 W (at 24 V DC)
Light properties		
Source of light type	LED	LED
Service life, lighting appliance	50,000 h (L70)	50,000 h (L70)
Number of LEDs	6	12
Light color	Daylight white	Daylight white
Color temperature	5800 K ±10 %	5800 K ±10 %
Color rendering index	75	75
Illumination	max. 206 lx (50 cm distance)	max. 391 lx (50 cm distance)
Average illumination	89 lx (Distance of 50 cm over 1 m^2 area)	169 lx (Distance of 50 cm over 1 m^2 area)
Emission angle	95 ° (C0-C180) / 105 ° (C90-C270)	95 ° (C0-C180) / 105 ° (C90-C270)
Energy efficiency class	A+	A+
General data		
Connection method	Open cable end	Open cable end
Weight	0.2 kg	0.4 kg
Degree of protection	IP67	IP67
Mounting position	any	any
Ambient temperature (operation)	0 °C ... 40 °C	0 °C ... 40 °C

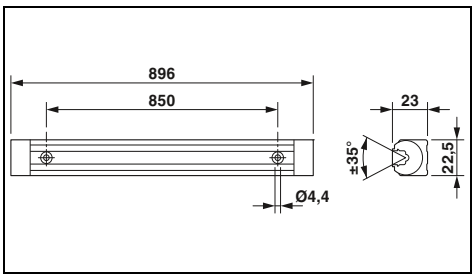
	Ordering data			Ordering data		
Description	**Type**	**Order No.**	Pcs./Pkt.	**Type**	**Order No.**	Pcs./Pkt.
LED machine light						
	PLD M 160 W-95/105 196	2702475	1	**PLD M 160 W-95/105 336**	2702476	1

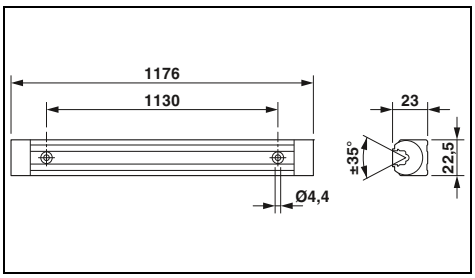
Length 616 mm

Length 896 mm

Length 1176 mm







Technical data

	24 V DC
	22 V DC ... 29 V DC
	typ. 0.58 A (at 24 V DC)
	approx. 14 W (at 24 V DC)
	LED
	50,000 h (L70)
	24
	Daylight white
	5800 K ±10 %
	75
	max. 691 lx (50 cm distance)
	336 lx (Distance of 50 cm over 1 m² area)
	95 ° (C0-C180) / 105 ° (C90-C270)
	A+
	Open cable end
	0.7 kg
	IP67
	any
	0 °C ... 40 °C

Ordering data

Type	Order No.	Pcs./Pkt.
PLD M 160 W-95/105 616	2702477	1

Technical data

	24 V DC
	22 V DC ... 29 V DC
	typ. 0.875 A (at 24 V DC)
	approx. 21 W (at 24 V DC)
	LED
	50,000 h (L70)
	36
	Daylight white
	5800 K ±10 %
	75
	max. 833 lx (50 cm distance)
	449 lx (Distance of 50 cm over 1 m² area)
	95 ° (C0-C180) / 105 ° (C90-C270)
	A+
	Open cable end
	0.8 kg
	IP67
	any
	0 °C ... 40 °C

Ordering data

Type	Order No.	Pcs./Pkt.
PLD M 160 W-95/105 896	2702478	1

Technical data

	24 V DC
	22 V DC ... 29 V DC
	typ. 1.17 A (at 24 V DC)
	approx. 28 W (at 24 V DC)
	LED
	50,000 h (L70)
	48
	Daylight white
	5800 K ±10 %
	75
	max. 908 lx (50 cm distance)
	535 lx (Distance of 50 cm over 1 m² area)
	95 ° (C0-C180) / 105 ° (C90-C270)
	A+
	Open cable end
	1 kg
	IP67
	any
	0 °C ... 40 °C

Ordering data

Type	Order No.	Pcs./Pkt.
PLD M 160 W-95/105 1176	2702479	1

Class 200 LED machine lights

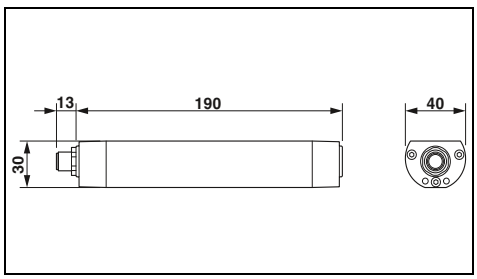
These LED lights are designed for use inside machinery.

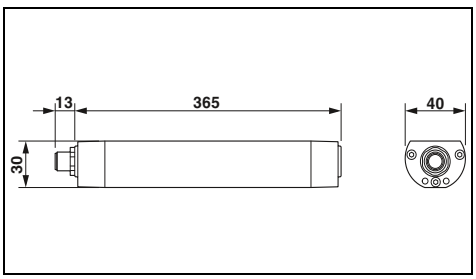
Your advantages

- Space saving, thanks to the small diameter
- Plug-in supply line enables free choice of the cable length as well as quick and easy installation
- Focused illumination, thanks to swivel action
- IP67 protection and resistance to cooling agents and lubricants enables use in machine tools
- Can be used at high temperatures and can be subjected to strong vibrations and shocks
- Safety glass enables use even in environments with potential mechanical strain
- Particularly economical thanks to energy-efficient LED technology and an LED service life of at least 60,000 h

Ø 40 mm
Length 190 mm

Ø 40 mm
Length 365 mm





	Technical data	Technical data
Power supply for module electronics		
Supply voltage	24 V DC	24 V DC
Supply voltage range	20 V DC ... 28 V DC	20 V DC ... 28 V DC
Current consumption	typ. 0.21 A (at 24 V DC)	typ. 0.44 A (at 24 V DC)
Power consumption	approx. 5 W (at 24 V DC)	approx. 10.5 W (at 24 V DC)
Light properties		
Source of light type	LED	LED
Service life, lighting appliance	60000 h (L70)	60000 h (L70)
Number of LEDs	12	27
Light color	Neutral white	Neutral white
Color temperature	5000 K	5000 K
Color rendering index	80	80
Illumination	max. 216 lx (Distance of 1 m)	max. 477 lx (Distance of 1 m)
Average illumination	156 lx (Distance of 1 m over 1 m^2 area)	348 lx (Distance of 1 m over 1 m^2 area)
Emission angle	85 ° (C0-C180) / 95 ° (C90-C270)	85 ° (C0-C180) / 95 ° (C90-C270)
Energy efficiency class	A+	A+
General data		
Connection method	M12 connector, (A-coded)	M12 connector, (A-coded)
Weight	0.3 kg	0.55 kg
Degree of protection	IP67	IP67
Note on dimensions	Length without M12 panel-mount connector	Length without M12 panel-mount connector
Mounting position	any	any
Ambient temperature (operation)	0 °C ... 50 °C	0 °C ... 50 °C

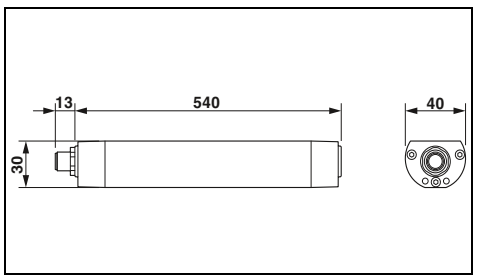
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
LED machine light	**PLD M 260 W-85/95 190/D40**	2702480	1	**PLD M 260 W-85/95 365/D40**	2702481	1
LED machine light						

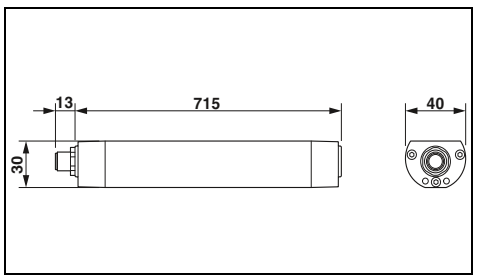
	Accessories			Accessories		
Mounting holder	**PLD M-ME MC/D40**	2702492	1	**PLD M-ME MC/D40**	2702492	1
Mounting brackets	**PLD M-ME MB/D40**	2702527	1	**PLD M-ME MB/D40**	2702527	1

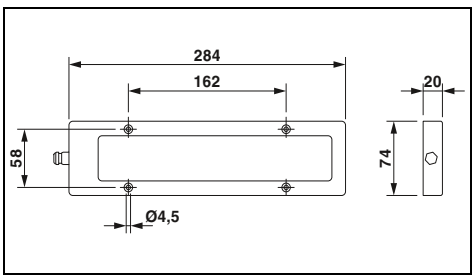
Ø 40 mm
Length 540 mm

Ø 40 mm
Length 715 mm

IP67/IPX9 degree of protection







Technical data

Supply voltage	24 V DC
Supply voltage range	20 V DC ... 28 V DC
Current consumption	typ. 0.67 A (at 24 V DC)
Power consumption	approx. 16 W (at 24 V DC)
Light source	LED
Service life	60000 h (L70)
Number of LEDs	42
Color	Neutral white
Color temperature	5000 K
Color rendering	80
Luminous intensity	max. 732 lx (Distance of 1 m)
Luminous intensity	541 lx (Distance of 1 m over 1 m² area)
Beam angle	85 ° (C0-C180) / 95 ° (C90-C270)
Energy efficiency class	A+
Connection method	M12 connector, (A-coded)
Weight	0.8 kg
Degree of protection	IP67
Mounting	Length without M12 panel-mount connector
Mounting position	any
Ambient temperature (operation)	0 °C ... 50 °C

Ordering data

Type	Order No.	Pcs./Pkt.
PLD M 260 W-85/95 540/D40	2702482	1

Accessories

PLD M-ME MC/D40	2702492	1
PLD M-ME MB/D40	2702527	1

Technical data

Supply voltage	24 V DC
Supply voltage range	20 V DC ... 28 V DC
Current consumption	typ. 0.9 A (at 24 V DC)
Power consumption	approx. 21.5 W (at 24 V DC)
Light source	LED
Service life	60000 h (L70)
Number of LEDs	57
Color	Neutral white
Color temperature	5000 K
Color rendering	80
Luminous intensity	max. 957 lx (Distance of 1 m)
Luminous intensity	718 lx (Distance of 1 m over 1 m² area)
Beam angle	85 ° (C0-C180) / 95 ° (C90-C270)
Energy efficiency class	A+
Connection method	M12 connector, (A-coded)
Weight	1.1 kg
Degree of protection	IP67
Mounting	Length without M12 panel-mount connector
Mounting position	any
Ambient temperature (operation)	0 °C ... 50 °C

Ordering data

Type	Order No.	Pcs./Pkt.
PLD M 260 W-85/95 715/D40	2702483	1

Accessories

PLD M-ME MC/D40	2702492	1
PLD M-ME MB/D40	2702527	1

Technical data

Supply voltage	24 V DC
Supply voltage range	22 V DC ... 26 V DC
Current consumption	typ. 0.54 A (at 24 V DC)
Power consumption	approx. 13 W (at 24 V DC)
Light source	LED
Service life	50,000 h (L70)
Number of LEDs	6
Color	Daylight white
Color temperature	6500 K ±10 %
Color rendering	65
Luminous intensity	max. 869 lx (Distance of 1 m)
Luminous intensity	347 lx (Distance of 1 m over 1 m² area)
Beam angle	40 °
Energy efficiency class	A+
Connection method	Open cable end
Weight	1 kg
Degree of protection	IP67/IPX9
Mounting	-
Mounting position	any
Ambient temperature (operation)	0 °C ... 40 °C

Ordering data

Type	Order No.	Pcs./Pkt.
PLD M 280 W-40 284	2702491	1

Accessories

Class 200 LED machine lights

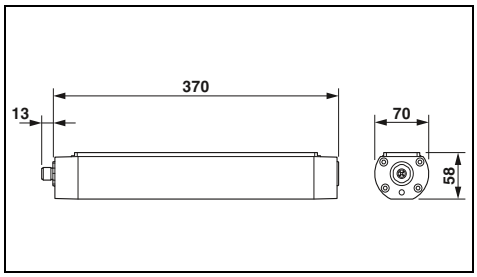
These LED lights are designed for use inside machinery.

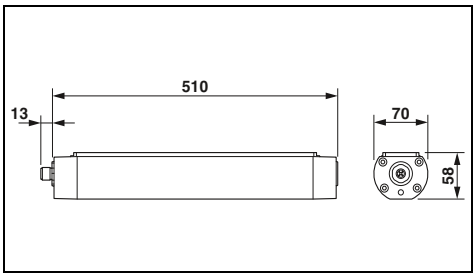
Your advantages

- Easy mechanical replacement of traditional tube lights (retrofit), thanks to 70 mm diameter
- Plug-in supply line enables free choice of the cable length as well as quick and easy installation
- Focused illumination, thanks to swivel action
- IP67 protection and resistance to cooling agents and lubricants enables use in machine tools
- Can be used at high temperatures and can be subjected to strong vibrations and shocks
- Safety glass enables use even in environments with potential mechanical strain

Ø 70 mm
Length 370 mm

Ø 70 mm
Length 510 mm





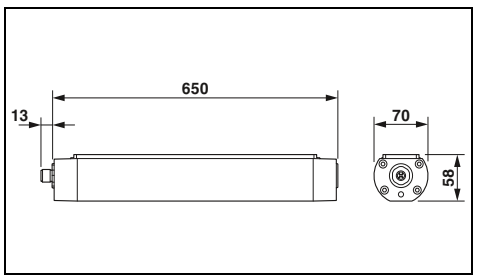
	Technical data	Technical data
Power supply for module electronics		
Supply voltage	24 V DC	24 V DC
Supply voltage range	18 V DC ... 30 V DC	18 V DC ... 30 V DC
Current consumption	typ. 0.5 A (at 24 V DC)	typ. 0.75 A (at 24 V DC)
Power consumption	approx. 12 W (at 24 V DC)	approx. 18 W (at 24 V DC)
Light properties		
Source of light type	LED	LED
Service life, lighting appliance	60000 h (L70)	60000 h (L70)
Number of LEDs	24	36
Light color	Neutral white	Neutral white
Color temperature	5000 K ±8 %	5000 K ±8 %
Color rendering index	85	85
Illumination	max. 443 lx (Distance of 1 m)	max. 662 lx (Distance of 1 m)
Average illumination	340 lx (Distance of 1 m over 1 m^2 area)	506 lx (Distance of 1 m over 1 m^2 area)
Emission angle	75 ° (C0-C180) / 95 ° (C90-C270)	75 ° (C0-C180) / 95 ° (C90-C270)
Energy efficiency class	A+	A+
General data		
Connection method	M12 connector, (A-coded)	M12 connector, (A-coded)
Weight	1.2 kg	1.7 kg
Degree of protection	IP67	IP67
Note on dimensions	Length without M12 panel-mount connector	Length without M12 panel-mount connector
Mounting position	any	any
Ambient temperature (operation)	0 °C ... 45 °C	0 °C ... 45 °C

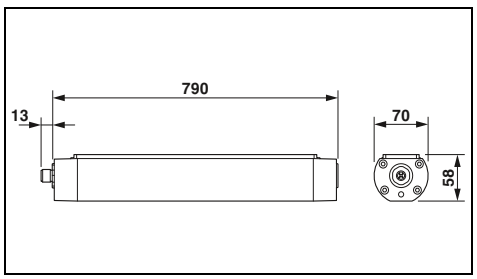
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
LED machine light						
	PLD M 260 W-75/95 370/D70	2702484	1	**PLD M 260 W-75/95 510/D70**	2702485	1
	Accessories			**Accessories**		
Mounting holder	**PLD M-ME MC/D70**	2702493	1	**PLD M-ME MC/D70**	2702493	1
Mounting brackets	**PLD M-ME MB/D70**	2702494	1	**PLD M-ME MB/D70**	2702494	1

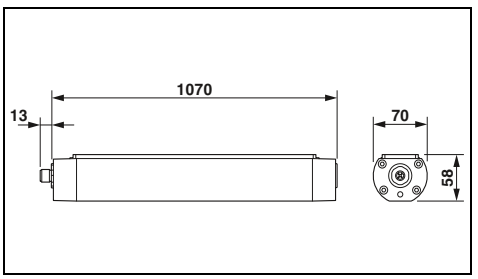
Ø 70 mm
Length 650 mm

Ø 70 mm
Length 790 mm

Ø 70 mm
Length 1070 mm







Technical data

24 V DC	
18 V DC ... 30 V DC	
typ. 1 A (at 24 V DC)	
approx. 24 W (at 24 V DC)	
LED	
60000 h (L70)	
48	
Neutral white	
5000 K ±8 %	
85	
max. 856 lx (Distance of 1 m)	
657 lx (Distance of 1 m over 1 m² area)	
75 ° (C0-C180) / 95 ° (C90-C270)	
A+	
M12 connector, (A-coded)	
2.1 kg	
IP67	
Length without M12 panel-mount connector	
any	
0 °C ... 45 °C	

Ordering data

Type	Order No.	Pcs./Pkt.
PLD M 260 W-75/95 650/D70	2702486	1

Accessories

PLD M-ME MC/D70	2702493	1
PLD M-ME MB/D70	2702494	1

Technical data

24 V DC	
18 V DC ... 30 V DC	
typ. 1.25 A (at 24 V DC)	
approx. 30 W (at 24 V DC)	
LED	
60000 h (L70)	
60	
Neutral white	
5000 K ±8 %	
85	
max. 1056 lx (Distance of 1 m)	
814 lx (Distance of 1 m over 1 m² area)	
75 ° (C0-C180) / 95 ° (C90-C270)	
A+	
M12 connector, (A-coded)	
2.6 kg	
IP67	
Length without M12 panel-mount connector	
any	
0 °C ... 45 °C	

Ordering data

Type	Order No.	Pcs./Pkt.
PLD M 260 W-75/95 790/D70	2702488	1

Accessories

PLD M-ME MC/D70	2702493	1
PLD M-ME MB/D70	2702494	1

Technical data

24 V DC	
18 V DC ... 30 V DC	
typ. 1.75 A (at 24 V DC)	
approx. 42 W (at 24 V DC)	
LED	
60000 h (L70)	
84	
Neutral white	
5000 K ±8 %	
85	
max. 1391 lx (Distance of 1 m)	
1089 lx (Distance of 1 m over 1 m² area)	
75 ° (C0-C180) / 95 ° (C90-C270)	
A+	
M12 connector, (A-coded)	
3.8 kg	
IP67	
Length without M12 panel-mount connector	
any	
0 °C ... 45 °C	

Ordering data

Type	Order No.	Pcs./Pkt.
PLD M 260 W-75/95 1070/D70	2702489	1

Accessories

PLD M-ME MC/D70	2702493	1
PLD M-ME MB/D70	2702494	1

LED tower lighting

The LED lights illuminate towers and shafts reliably and efficiently. The light is designed for continuous operation for work spaces or ladders.

Your advantages:
– Time-saving installation thanks to pre-assembled cabling
– No electrician required thanks to plug-in connection technology
– Long service life of the lights for maintenance-free lighting

Wide optical distribution

Technical data

Power supply for module electronics	
Supply voltage range	100 V AC ... 250 V AC (50/60 Hz)
Current consumption	typ. 42 mA (for 230 V AC)
Power consumption	approx. 10 W (for 230 V AC)
Light properties	
Source of light type	LED
Service life, lighting appliance	50,000 h (L70)
Number of LEDs	24
Light color	Neutral white
Color temperature	5000 K
Color rendering index	70
Luminous flux	1100 lm (Gross)
General data	
Connection method	QUICKON fast connection
Weight	687 g
Degree of protection	IP67
Width	91.7 mm
Height	76.2 mm
Length	307 mm
Note on dimensions	Specfications with connectors
Mounting position	any
Ambient temperature (operation)	-40 °C ... 70 °C

Ordering data

Description	Type	Order No.	Pcs./Pkt.
LED lighting	**PLD T/1AC/AS/1CON**	2402991	1
LED lighting - Suitable for series connection			

Accessories

Mounting set, with two brackets	**PLD T/1AC/MNT**	2402993	1

Wide optical distribution, suitable for series connection

Technical data	
100 V AC ... 250 V AC (50/60 Hz)	
typ. 42 mA (for 230 V AC)	
approx. 10 W (for 230 V AC)	
LED	
50,000 h (L70)	
24	
Neutral white	
5000 K	
70	
1100 lm (Gross)	
QUICKON fast connection	
802 g	
IP67	
91.7 mm	
76.2 mm	
362 mm	
Specfications with connectors	
any	
-40 °C ... 70 °C	

Ordering data

Type	Order No.	Pcs./Pkt.
PLD T/1AC/AS/2CON	2402992	1

Accessories

PLD T/1AC/MNT	2402993	1

Directional light

Technical data	
100 V AC ... 250 V AC (50/60 Hz)	
typ. 42 mA (for 230 V AC)	
approx. 10 W (for 230 V AC)	
LED	
50,000 h (L70)	
6	
Neutral white	
5000 K	
70	
1100 lm (Gross)	
QUICKON fast connection	
702 g	
IP67	
91.7 mm	
76.2 mm	
307 mm	
Specfications with connectors	
any	
-40 °C ... 70 °C	

Ordering data

Type	Order No.	Pcs./Pkt.
PLD T/1AC/UD/1CON	2403121	1

Accessories

PLD T/1AC/MNT	2402993	1

Directional light, suitable for series connection

Technical data	
100 V AC ... 250 V AC (50/60 Hz)	
typ. 42 mA (for 230 V AC)	
approx. 10 W (for 230 V AC)	
LED	
50,000 h (L70)	
6	
Neutral white	
5000 K	
70	
1100 lm (Gross)	
QUICKON fast connection	
819 g	
IP67	
91.7 mm	
76.2 mm	
362 mm	
Specfications with connectors	
any	
-40 °C ... 70 °C	

Ordering data

Type	Order No.	Pcs./Pkt.
PLD T/1AC/UD/2CON	2403122	1

Accessories

PLD T/1AC/MNT	2402993	1

LED signal lights

The LED signal lights for maritime use can be used for the reliable and energy-efficient operation of light-signal systems, such as locks.

Status and diagnostics functions provide a detailed database for smart maintenance and ensure the traceability of the system operating behavior.

Your advantages:

– Fast diagnostics and long-term data backup through integration into your network with standard protocols
– Robust aluminum housing and salt-water-resistant connectors for harsh outdoor use
– Save costs with durable and efficient LED technology
– High availability, thanks to the use of safety-related autonomous monitoring functions

Light color: white

Technical data

Power supply for module electronics	
Supply voltage	24 V DC
Current consumption	1.6 A (white LEDs)
Power consumption	39 W (white LEDs)
Light properties	
Source of light type	LED
Service life, lighting appliance	100000 h
Number of LEDs	30 (according to IALA recommendation E200-1 and CIE 1931)
Light color	Neutral white
Color temperature	5000 K ±1000K
Luminous intensity	up to 1720 Cd
Emission angle	48 °
Can be dimmed	Yes, in 256 steps
General data	
Connection method	M17 circular connector
Weight	3.86 kg
Degree of protection	IP65/IP67
Width	272 mm
Height	291 mm
Depth	68 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs./Pkt.
LED signal light - Light color: red - Light color: yellow	**CSD-SL 300 WH**	2701785	1

Light color: green

Light color: blue

Light color: red/yellow

Technical data

24 V DC	
0.2 A (green LEDs)	
39 W (green LEDs)	
LED	
100000 h	
30 (according to IALA recommendation E200-1 and CIE 1931)	
green	
490...510 nm	
up to 1720 Cd	
48 °	
Yes, in 256 steps	
M17 circular connector	
3.86 kg	
IP65/IP67	
272 mm	
291 mm	
68 mm	
-25 °C ... 55 °C	

Ordering data

Type	Order No.	Pcs./Pkt.
CSD-SL 300 GN	2701786	1

Technical data

24 V DC	
0.2 A (blue LEDs)	
39 W (blue LEDs)	
LED	
100000 h	
30 (according to IALA recommendation E200-1 and CIE 1931)	
blue	
467 nm	
up to 1720 Cd	
48 °	
Yes, in 256 steps	
M17 circular connector	
3.86 kg	
IP65/IP67	
272 mm	
291 mm	
68 mm	
-25 °C ... 55 °C	

Ordering data

Type	Order No.	Pcs./Pkt.
CSD-SL 300 BU	2402723	1

Technical data

	CSD-SL 300 RD	CSD-SL 300 YE
24 V DC		
0.24 A (red LEDs)		0.27 A (yellow LEDs)
30 W (red LEDs)		39 W (yellow LEDs)
LED		
100000 h		
30 (according to IALA recommendation E200-1 and CIE 1931)		
red		yellow
620...645 nm		588...592 nm
up to 1548 Cd		up to 1720 Cd
48 °		
Yes, in 256 steps		
M17 circular connector		
3.86 kg		
IP65/IP67		
272 mm		
291 mm		
68 mm		
-25 °C ... 55 °C		

Ordering data

Type	Order No.	Pcs./Pkt.
CSD-SL 300 RD	2701788	1
CSD-SL 300 YE	2701787	1

Erecting a tower

A signal tower can be erected or extended without using any tools in a matter of seconds by simply placing the individual signal elements on top of each other and turning the bayonet locking system.

This automatically establishes an electrical connection between the elements. The control lines are then connected to screw or spring-cage terminal blocks in the connection element (bottom element).

Optical signal elements

The optical elements are available in a choice of five colors with various different signal types.

Audible signal elements

Signaling can also be supported by an audible element.

Mounting elements

The signal tower portfolio is completed by a wide range of mounting elements, which ensure optimum mounting of the signal towers according to the conditions.

Assemble your signal towers individually as follows:

① Select the appropriate mounting method for your application: base or tube mounting.

② If applicable, select the mounting bracket or junction box.

③ If applicable, select the foot and the required tube length: 110 mm ... 1000 mm.

④ Select the appropriate connection element for the mounting type: screw or spring-cage connection.

⑤ Select the required optical signal elements and if applicable, an audible signal element.

Optical signal element – multicolor

With the multicolor element, up to seven colors can be displayed with just one optical element. You can therefore save costs when it comes to storing and controlling signal towers.

The seven colors (red, yellow, green, blue, white, violet, and turquoise) are selected via a maximum of three control lines.

Features:

– Supply voltage: 24 V DC
– 7 colors can be selected
– The colors red, yellow, and green can be selected via just two control lines
– Minimum LED service life of 50,000 h

LED permanent light element, multicolor

Technical data

PSD electrical data	
Input voltage	24 V DC
Maximum inrush current	max. 500 mA
Current consumption	120 mA
General data	
Material	Polycarbonate PC
Weight	63 g
Height	65.5 mm
Diameter	70 mm
Degree of protection	IP65, when installed or with cover
Ambient temperature (operation)	-20 °C ... 50 °C
Mounting position	any

Ordering data

Description	Type	Order No.	Pcs./Pkt.
LED permanent light element, multicolor The colors white, red, yellow, green, blue, violet or turquoise can be selected via control signal combination	**PSD-S OE LED MC**	2702090	1

Accessories

End cover, black (replacement part)	**PSD-S AS END COVER**	2700148	1
Marking field for towers with tube mounting, complete with assembly material	**PSD-S AS LABEL BOARD**	2700147	1

Optical signal elements

The optical signal elements enable clear optical indication of the machine or system state.

Features:

– 5 signal types to choose from
– Can be freely combined
– High light and color intensity
– Minimum LED service life of 50,000 h
– All elements for 24 V DC
– Random flashing beacon ensures display cannot be ignored

LED permanent light element

LED blinking light element

Technical data

	...GN / ...CL / ...BU	...RD / ...YE
PSD electrical data		
Input voltage	24 V AC/DC	
Maximum inrush current	max. 500 mA	
Current consumption	25 mA	30 mA
General data		
Material	Polycarbonate PC	
Weight	58 g	
Height	65.5 mm	
Diameter	70 mm	
Degree of protection	IP65, when installed or with cover	
Ambient temperature (operation)	-30 °C ... 50 °C	
Mounting position	any	

Technical data

	...GN / ...CL / ...BU	...RD / ...YE
PSD electrical data		
Input voltage	24 V AC/DC	
Maximum inrush current	max. 500 mA	
Current consumption	25 mA	30 mA
General data		
Material	Polycarbonate PC	
Weight	59 g	
Height	65.5 mm	
Diameter	70 mm	
Degree of protection	IP65, when installed or with cover	
Ambient temperature (operation)	-20 °C ... 50 °C	
Mounting position	any	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Optical signal elements			
Color: Green	**PSD-S OE LED GN**	2700119	1
Color: white	**PSD-S OE LED CL**	2700127	1
Color: blue	**PSD-S OE LED BU**	2700131	1
Color: red	**PSD-S OE LED RD**	2700107	1
Color: yellow	**PSD-S OE LED YE**	2700122	1

Ordering data

Type	Order No.	Pcs./Pkt.
PSD-S OE LED BL GN	2700121	1
PSD-S OE LED BL CL	2700128	1
PSD-S OE LED BL BU	2700132	1
PSD-S OE LED BL RD	2700114	1
PSD-S OE LED BL YE	2700123	1

Accessories

End cover, black (replacement part)	**PSD-S AS END COVER**	2700148	1
Marking field for towers with tube mounting, complete with assembly material	**PSD-S AS LABEL BOARD**	2700147	1

Accessories

PSD-S AS END COVER	2700148	1
PSD-S AS LABEL BOARD	2700147	1

LED random flashing light element

LED flashing light element

LED rotating light element

Technical data

...CL / ...BU	...RD / ...YE
24 V DC	
max. 500 mA	
250 mA	350 mA
Polycarbonate PC	
78 g	
65.5 mm	
70 mm	
IP65, when installed or with cover	
-20 °C ... 50 °C	
any	

Ordering data

Type	Order No.	Pcs./Pkt.
PSD-S OE LED RFL CL	2700130	1
PSD-S OE LED RFL BU	2700135	1
PSD-S OE LED RFL RD	2700118	1
PSD-S OE LED RFL YE	2700126	1

Accessories

PSD-S AS END COVER	2700148	1
PSD-S AS LABEL BOARD	2700147	1

Technical data

24 V DC
max. 200 mA
35 mA
Polycarbonate PC
72 g
65.5 mm
70 mm
IP65, when installed or with cover
-20 °C ... 50 °C
any

Ordering data

Type	Order No.	Pcs./Pkt.
PSD-S OE LED FL CL	2700129	1
PSD-S OE LED FL BU	2700134	1
PSD-S OE LED FL RD	2700115	1
PSD-S OE LED FL YE	2700124	1

Accessories

PSD-S AS END COVER	2700148	1
PSD-S AS LABEL BOARD	2700147	1

Technical data

24 V AC/DC
max. 500 mA
≤ 40 mA
Polycarbonate PC
65 g
65.5 mm
70 mm
IP65, when installed or with cover
-20 °C ... 50 °C
any

Ordering data

Type	Order No.	Pcs./Pkt.
PSD-S OE LED RL RD	2700116	1
PSD-S OE LED RL YE	2700125	1

Accessories

PSD-S AS END COVER	2700148	1
PSD-S AS LABEL BOARD	2700147	1

Audible signal elements

The audible signal elements enable clear audible indication of the machine or system state.

Features:

– Buzzer and siren elements
– Minimum volume of 80 dB(A)
– Adjustable volume
– Multi-tone siren signaling depending on the situation
– Multilingual signaling thanks to voice output

Buzzer element, continuous/pulse tone

Siren element, alternating

Technical data

PSD electrical data	
Input voltage	-
Nominal input voltage range	12 V AC/DC ... 30 V AC/DC
Maximum inrush current	max. 200 mA
Current consumption	25 mA
Signaling	
Type of acoustic signal	Continuous/pulse tone
Signal frequency	approx. 1 Hz
Tone frequency	approx. 1.75 kHz
Volume	85 dB(A)
General data	
Material	Polycarbonate PC
Weight	73 g
Height	72 mm
Diameter	70 mm
Degree of protection	IP65, when installed
Ambient temperature (operation)	-30 °C ... 50 °C
Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Mounting position	any

Technical data

PSD electrical data	
Input voltage	24 V DC
Nominal input voltage range	-
Maximum inrush current	max. 500 mA
Current consumption	100 mA
Signaling	
Type of acoustic signal	Continuous tone, alternating
Signal frequency	-
Tone frequency	approx. 3.3 kHz ±9 %
Volume	105 dB(A)
General data	
Material	Polycarbonate PC
Weight	106 g
Height	79 mm
Diameter	70 mm
Degree of protection	IP40, when installed
Ambient temperature (operation)	-30 °C ... 50 °C
Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Mounting position	any

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Buzzer element, continuous/pulse tone	**PSD-S AE BM2-1 85DB**	2700136	1
Siren element - Alternating - Pulse tone, automatic volume control - 8 tones, tone selection via DIP switches - 7 tones, tone selection via 3 signal cables			
Voice output element, up to 15 sound sequences, maximum play time of 60 minutes			

Ordering data

Type	Order No.	Pcs./Pkt.
PSD-S AE SC1-2 105DB	2700139	1

Siren element, pulse tone

Siren element, tones can be selected

Voice output element

Technical data

24 V DC	
-	
max. 500 mA	
150 mA	
Pulse tone, automatic volume control	
approx. 1 Hz	
approx. 2.5 kHz	
-	
Polycarbonate PC	
122 g	
110 mm	
71.5 mm	
IP65, when installed	
-20 °C ... 50 °C	
Conformance with EMC Directive 2014/30/EU	
any	

Ordering data

Type	Order No.	Pcs./Pkt.
PSD-S AE SP1-3 100DB/2	2700137	1

Technical data

PSD-S AE SM8-5 100DB/1	PSD-S AE SM7-4 100DB/3
24 V AC/DC	24 V DC
-	
max. 500 mA	
80 mA	
8 tones, adjustable volume	7 tones, remotely controlled
approx. 1 Hz (Pulse tone)	
approx. 1.6 kHz	
max. 100 dB(A) (for continuous and pulse tone of 3.4 kHz)	
Polycarbonate PC	
81 g	80 g
72 mm	
70 mm	
IP65, when installed	
-30 °C ... 50 °C	-20 °C ... 50 °C
Conformance with EMC Directive 2014/30/EU	
any	

Ordering data

Type	Order No.	Pcs./Pkt.
PSD-S AE SM8-5 100DB/1	2700138	1
PSD-S AE SM7-4 100DB/3	2700141	1

Technical data

24 V DC	
-	
max. 3 A (for approximately 2 ms)	
< 50 mA (in standby mode)	
Voice, max. 15 texts	
-	
-	
approx. 88 dB(A)	
Polycarbonate PC	
184 g	
110 mm	
71.5 mm	
IP65, when installed	
-20 °C ... 50 °C	
Conformance with EMC Directive 2014/30/EU	
any	

Ordering data

Type	Order No.	Pcs./Pkt.
PSD-S AE V15/1	2700140	1

Connection elements

The cables for controlling the optical and/or audible elements are connected to the connection element. They can either be mounted directly on a surface or on a tube.

For surface mounting

For tube mounting

	Technical data	Technical data
PSD electrical data		
Nominal input voltage range	12 V AC/DC ... 240 V AC/DC	12 V AC/DC ... 240 V AC/DC
General data		
Material	PA-GF	PA-GF
Weight	83 g	84 g
Height	27 mm	27 mm
Diameter	69 mm	69 mm
Degree of protection	IP65, when installed	IP65, when installed
Ambient temperature (operation)	-30 °C ... 50 °C	-30 °C ... 50 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Connection element						
- With screw connection terminal blocks	**PSD-S CE-SM SCREW**	2700093	1	**PSD-S CE-TM SCREW**	2700095	1
- With spring-cage terminal blocks	**PSD-S CE-SM SPRING**	2700091	1	**PSD-S CE-TM SPRING**	2700092	1
	Accessories			**Accessories**		
Cable gland, M16 x 1.5 mm, black	**PSD-S AS CABLE GLAND M16X1,5**	2700145	1			

Mounting elements for base mounting

For base mounting, the mounting foot of the connection element can be mounted on a junction box or a mounting bracket as an option.

Your options:
- With visible cable routing
- With concealed cable routing
- Two-sided mounting for up to 10 signal elements

Junction box and bracket

Bracket with concealed cable routing

	Technical data		Technical data	
	PSD-S ME OB	PSD-S ME BR-SM	PSD-S ME BR-SM/1S	PSD-S ME BR-SM/2S
General data				
Material	PA-GF	PA A3 x 2G5	PA A3 x 2G5	PA A3 x 2G5
Weight	73 g	40 g	78 g	71 g
Ambient temperature (operation)	-30 °C ... 60 °C	-30 °C ... 50 °C	-30 °C ... 60 °C	-30 °C ... 60 °C
Mounting type	Base mounting	Base mounting	Base mounting	Base mounting

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Junction box with lateral cable entry						
- For base mounting	**PSD-S ME OB**	2700153	1			
Mounting bracket						
- With visible cable routing	**PSD-S ME BR-SM**	2700144	1			
Mounting bracket with concealed cable routing						
- For single-sided base mounting				**PSD-S ME BR-SM/1S**	2700160	1
- For two-sided base mounting				**PSD-S ME BR-SM/2S**	2700161	1

Mounting feet and tubes

For tube mounting, the connection element is mounted directly on a tube.

The options are as follows:

– Adapter for single hole mounting
– Foot with integrated tube
– Plastic foot for short tubes
– Metal foot for long tubes
– Foldaway base for vertical alignment with angled surfaces

Adapter and mounting foot with tube

Mounting feet and tubes

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Adapter for single hole mounting	**PSD-S ME A-SH M18**	2700150	1			
Foot with integrated tube - 110 mm long	**PSD-S ME BT 110**	2700156	1			
Foot for tube, Ø 25 mm						
- Plastic				**PSD-S ME B-P**	2700163	1
- Metal				**PSD-S ME B-M**	2700164	1
Tube, Ø 25 mm						
- 250 mm long				**PSD-S ME T-M 250**	2700157	1
- 400 mm long				**PSD-S ME T-M 400**	2700158	1
- 1000 mm long				**PSD-S ME T-M 1000**	2700154	1
Foldaway base - 7.5° pitch				**PSD-S ME FB**	2700151	1
Tube, for direct mounting on the foldaway base - 45 mm long				**PSD-S ME T-P 45**	2700152	1

Mounting elements for tube mounting

For tube mounting, the mounting foot can be mounted on a junction box or a mounting bracket as an option.

Your options:

– With visible cable routing
– With concealed cable routing
– Magnetic base for tool-free mounting on metal surfaces

Junction boxes

Brackets

	Technical data		Technical data	
	PSD-S ME OB	PSD-S ME OB/MB	PSD-S ME BR-BM/HCR	PSD-S ME BR-BM
General data				
Material	PA-GF	PA-GF	ABS-PC	PA A3 x 2G5
Weight	73 g	299 g	80 g	60 g
Ambient temperature (operation)	-30 °C ... 60 °C	-30 °C ... 60 °C	-30 °C ... 60 °C	-30 °C ... 50 °C
Mounting type	Base mounting	Base mounting	Base mounting, concealed cable routing	Base mounting

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Junction box with lateral cable entry						
- For base mounting	**PSD-S ME OB**	2700153	1			
- With magnetic base	**PSD-S ME OB/MB**	2700155	1			
Mounting bracket						
- With concealed cable routing				**PSD-S ME BR-BM/HCR**	2700149	1
- With visible cable routing				**PSD-S ME BR-BM**	2700143	1

24V
0V
PWR
ST
GW PL ETH/ UNI-BUS
CH1 CH2
CH3 CH4
CH5 CH6
CH7 CH8
GW PL HART8-BUS
PHOENIX CONTACT

Process infrastructure

Process infrastructure connects the control level to the field level via modern fieldbuses, I/O modules, and wireless communication systems.

Modern process technology, including WirelessHART, FOUNDATION Fieldbus, PROFIBUS PA, and I/O solutions for potentially explosive areas can be used in numerous different industries, including mining, water/waste water, and oil and gas. Phoenix Contact offers flexible solutions for all applications and customer requirements.

– Process infrastructure is suitable for all applications and environments
– Failure times are reduced thanks to high integrity and hot swapping
– Multifunctional remote I/Os enable greater flexibility
– Remote access to error diagnostics means that ex areas do not have to be entered
– Approvals for all applications

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Process fieldbus

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Inline Ex i – intrinsically safe I/Os for the ex area

Intrinsically safe power supply terminal
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Surge protection for MCR technology

• See Catalog 4 –
PLUGTRAB PT-IQ –
Surge protection for Ex i circuits

Your web code: #0292

• See Catalog 4 –
TERMITRAB complete –
terminal blocks (intrinsically safe) with multi-stage surge protection

Your web code: #0292

• See Catalog 4 –
SURGETRAB – field devices directly at the sensor head (intrinsically safe)

Your web code: #0292

Measurement and control technology

• See Catalog 5 –
Ex i signal conditioners with functional safety

Your web code: #0293

• See Catalog 5 –
Ex i 2-wire field devices

Your web code: #0294

The FB… line was designed specifically to meet the tough requirements of the process environment. This includes various approvals for installation in Zone 2 or Division 2 hazardous locations.

The FB… line of modular fieldbus components offers connectivity from the process controller to the field devices. Together with redundant bulk power, surge protection, and cabling cordsets, a complete connection architecture is provided.

The line includes device couplers for use with both FOUNDATION Fieldbus and PROFIBUS PA. These couplers provide short-circuit protection to ensure that a fault on a branch line does not disrupt the entire segment. They also offer energy limited outputs, intrinsic safety and electrical isolation.

Based on the T-bus connection system, the field components are hot-swappable and allow easy system expansion. Single-loop-integrity can be acheived by connection of a single module to a single instrument. With the limited width on the rail, the size and weight of the associated field enclosure is minimized.

Also available are redundant and simplex power supplies. Each electrically isolated supply provides power while allowing digital communications to one segment.

All components include built-in status LEDs. Integrated terminators in the power supplies, together with a connector-mounted version in the field, reduce the opportunity for segment termination error.

Field junction boxes

- Designed specifically for field device coupler systems
- Bus bar and shield clamps
- Entries for trunk in, trunk out and breather connections
- Each enclosure is equipped with M20 ports and can be configured as desired
- Cable glands, plugs and breather ordered separately

10" x 10"

14" x 12"

Ex:

Ex:

		Technical data	Technical data
General data			
Housing material		Stainless steel	Stainless steel
Dimensions	W / H / D	254 mm / 254 mm / 127 mm	355.6 mm / 304.8 mm / 127 mm
Weight		4640 g	6540 g
Degree of protection		IP66	IP66
Ambient temperature (operation)		-40 °C ... 70 °C	-40 °C ... 70 °C
Conformance/Approvals			
ATEX		DEMKO 16ATEX1704X II 3 G D Ex nA [ic] IIC T4 Gc, Ex nA nC [ic] IIC T4 Gc Ex ic IIC T4 Gc, FISCO ic branch lines Ex tc IIIC T135 Dc IP66	DEMKO 16ATEX1704X II 3 G D Ex nA [ic] IIC T4 Gc, Ex nA nC [ic] IIC T4 Gc Ex ic IIC T4 Gc, FISCO ic branch lines Ex tc IIIC T135 Dc IP66
IECEx		IECEx UL 16.0079X Ex nA [ic] IIC T4 Gc, Ex nA nC [ic] IIC T4 Gc Ex ic IIC T4 Gc, FISCO ic branch lines Ex tc IIIC T135 Dc IP66	IECEx UL 16.0079X Ex nA [ic] IIC T4 Gc, Ex nA nC [ic] IIC T4 Gc Ex ic IIC T4 Gc, FISCO ic branch lines Ex tc IIIC T135 Dc IP66
UL, USA/Canada		Class I, Zone 2, AEx nA [ic] IIC T4 Gc, AEx nA nC[ic] IIC T4 Gc Entity/FISCO branch lines Class I, Div. 2, Groups A, B, C, D, T4 Class I, Zone 22, AEx tc IIIC T135 Dc IP66	Class I, Zone 2, AEx nA [ic] IIC T4 Gc, AEx nA nC[ic] IIC T4 Gc Entity/FISCO branch lines Class I, Div. 2, Groups A, B, C, D, T4 Class I, Zone 22, AEx tc IIIC T135 Dc IP66

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Enclosure, stainless steel, with ten ports for use in hazardous locations, includes six-branch line block device coupler (FB-6SP)						
- includes three terminal blocks for trunk cable connection (+, -, S)	**FB1-S1-6SP-T-0-10-00-0-0**	2316420	1			
- includes PLUGTRAB surge base (PT 4+F-BE) for trunk cable connection (+, -, S)	**FB1-S1-6SP-S-0-10-00-0-0**	2316446	1			
Enclosure, stainless steel, with 16 ports for use in hazardous locations, includes 12-branch line block device coupler (FB-12SP)						
- includes three terminal blocks for trunk cable connection (+, -, S)				**FB2-S1-12SP-T-0-16-00-0-0**	2316417	1
- includes PLUGTRAB surge base (PT 4+F-BE) for trunk cable connection (+, -, S)				**FB2-S1-12SP-S-0-16-00-0-0**	2316433	1

	Accessories			Accessories		
Cable gland, M20, includes nut	**FB-M-KV-M20-EX**	2900197	1	**FB-M-KV-M20-EX**	2900197	1
Stopping plug, M20, includes nut	**FB-M-BS-M20-EX**	2900209	10	**FB-M-BS-M20-EX**	2900209	10
Breather plug, M20, includes nut	**FB-M-BD-M20-EX**	2901859	1	**FB-M-BD-M20-EX**	2901859	1

Device couplers for the field

The fieldbus device couplers are suitable for FOUNDATION Fieldbus and PROFIBUS PA. They provide an interface between the fieldbus trunk line and field devices. The compact width on the DIN rail reduces the required dimensions and weight of the field housing.

FB-ET/E
– Connects to the trunk and provides voltage limiting
– Includes a pre-installed external terminator, ensuring termination is always available.
– Diagnostic LEDs include DC OK, low voltage warning, and communication on the segment.

FB-2SP/E and FB-ISO
– Hot-swappable and scalable
– Single-sided connector configuration simplifies wiring in field housing
– Diagnostic LEDs indicate DC OK and errors at the branch line connection

For FB-ISO device only
– Comprehensive channel-to-channel electrical isolation
– Provides an intrinsically safe, FISCO connection

FB-2SP/24DC
– Isolator with terminal blocks for two branch line connections to each device coupler
– Short-circuit protection to the fieldbus trunk with an additional voltage-limitation circuit
– Allows the connection of branch lines and end devices in an Ex nA ic hazardous location

Device coupler with TBUS for trunk line connection and termination

Ex:

Technical data

Supply		
Supply voltage range		10.5 V DC ... 32 V DC (input on trunk line side)
Typical current consumption		-
Max. current consumption		2 mA (with terminator)
Fieldbus interface		
Rated voltage		-
Termination resistor		100 Ω, external removable plug included
Surge protection		Active if voltage exceeds 39 V (typ.) or 41 V (max.)
General data		
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Dimensions	W / H / D	17.5 mm / 99.1 mm / 70.4 mm
Degree of protection		IP20
Ambient temperature (operation)		-40 °C ... 85 °C
Max. permissible relative humidity (operation)		< 95 % (non-condensing)
Conformance/Approvals		
Conformance		CE-compliant, additionally EN 61326
NE		NAMUR NE 21
ATEX		Sira 14ATEX4017X; II 3G; Ex nA IIC T4 Gc; Ex ic IIC T4, FISCO ic
IECEx		IECEx SIR 14.0010X; Ex nA IIC T4 Gc; Ex ic IIC T4 Gc, FISCO ic
CSA, USA/Canada		Class I, Div. 2, Groups A, B, C, D; Ex nA IIC T4 Gc; Ex nL IIC T4, FNICO; Ex ic IIC T4 Gc, FISCO ic Class I, Zone 2; AEx nA IIC T4 Gc; AEx nL IIC T4, FNICO; AEx ic IIC T4 Gc, FISCO ic
FOUNDATION Fieldbus		FF-846
EMC note		Class A product, see page 525

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Device coupler, for FOUNDATION Fieldbus and PROFIBUS PA			
	FB-ET/E	2316050	1
Isolator, for FOUNDATION Fieldbus			

Accessories

Partition plate			
DIN rail connector			

Device coupler with TBUS for 2 branch lines

Ex: SIRA

Technical data

	10.5 V DC ... 32 V DC (via FB-ET/E)
	-
	3.5 mA (No-load)
	≤ 32 V (each branch line)
	-
	-
	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
	17.5 mm / 89.7 mm / 70.4 mm
	IP20
	-40 °C ... 85 °C (depending on set rated current)
	< 95 % (non-condensing)
	-
	NAMUR NE 21
	Sira 14ATEX4018X; II 3(3)G Ex nA [ic] IIC T4 Gc; Ex nA [ic] IIC T4 Gc, FISCO ic branch lines
	IECEx SIR 14.0011X; Ex nA [ic] IIC T4 Gc; Ex nA [ic] IIC T4 Gc, FISCO ic branch lines
	Class I, Div. 2, Groups A,B,C,D Ex nL IIC T4 FNICO, Ex ic IIC T4 FISCO ic Ex nA [nL] IIC T4, Ex nA [ic] IIC T4 Ex nA [nL] IIC T4 FNICO branch lines, Ex nA [ic] IIC T4 FISCO ic branch lines Class I, Zone 2 AEx nL IIC T4 FNICO, AEx ic IIC T4 FISCO ic AEx nA [nL] IIC T4, AEx nA [ic] IIC T4
	FF-846
	Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FB-2SP/E	2316052	1

Accessories

Device coupler with TBUS for 1 electrically isolated branch line connection

Ex: IECEx SIRA

Technical data

	17 V DC ... 32 V DC (input on trunk line side)
	10 mA
	-
	≥ 10 V (each branch line)
	-
	-
	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
	17.5 mm / 89.7 mm / 70.4 mm
	IP20
	-40 °C ... 60 °C
	< 95 % (non-condensing)
	CE-compliant, additionally EN 61326
	NAMUR NE 21
	II 3(3) G Ex nA [nL Gc] IIC T4 Gc, FNICO power supply (branch line) II 3(1) GD Ex nA [ia Ga Da] IIC T4 Gc, FISCO power supply (branch line)
	Ex nA [nL Gc] IIC T4 Gc, FNICO power supply (branch line) Ex nA [ia Ga Da] IIC T4 Gc, FISCO power supply (branch line)
	Ex nA [ia] IIC T4
	-
	Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FB-ISO	2316064	1

Accessories

FB-MODULAR-PP	2316061	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	2707437	50

Isolator for Zone 2 installation using the intrinsically safe [ic] protection method

Technical data

	9 V DC ... 30 V DC
	-
	-
	≤ 32 V (each branch line)
	-
	-
	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
	17.5 mm / 89.7 mm / 70.4 mm
	IP20
	-40 °C ... 85 °C
	-
	-
	NAMUR NE 21
	Sira 13ATEX4016; II 3(3)G Ex nA [ic] IIC T4 Gc
	IECEx SIR 13.0001X; Ex nA [ic] IIC T4 Gc
	Class I, Div. 2, Groups A, B, C, D; Ex nA[ic] IIC T4 Gc Class I, Zone 2; AEx nA[ic] IIC T4 Gc
	FF-846
	Class A product, see page 525

Ordering data

Type	Order No.	Pcs./Pkt.
FB-2SP/24DC	2316352	1

Accessories

FB-MODULAR-PP	2316061	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	2707437	50

Device couplers for field devices

new

- Couple field devices and provide short-circuit current limiting
- Provide non-sparking and FISCO ic branch line connections
- Single-sided connection configuration simplifies wiring in field housing
- Diagnostic LEDs indicate DC OK and errors at the branch line connection
- Fulfills the requirements of EN 60079-0:2012, EN 60079-11:2012, EN 60079-15:2005 and EN 60079-15:2010.

for installation in Ex Zone 1

for installation in Ex Zone 2

Ex:

		Technical data		Technical data	
		FB-8SP ISO	FB-12SP ISO	FB-6SP	FB-12SP
Supply					
Supply voltage range		16 V DC ... 32 V DC (input on trunk line side)		10.5 V DC ... 32 V DC (input on trunk line side)	
Typical current consumption		-		4.8 mA	6.5 mA
Max. current consumption		35 mA (trunk, no load) 350 mA (maximum trunk current)	50 mA (trunk, no load) 550 mA (maximum trunk current)	-	
Fieldbus interface					
Rated voltage		≤ 14 V (each branch line)		≤ 32 V (each branch line)	
Rated current		35 mA (per branch line)		38 mA	
Termination resistor		Integrated termination, activated with bridge located in correct terminals		100 Ω, external removable plug included	
General data					
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12	
Dimensions	W / H / D	280 mm / 142.3 mm / 55.25 mm		148.2 mm / 112.5 mm / 83.5 mm	254.1 mm / 112.5 mm / 83.5 mm
Degree of protection		IP20, IP30 over trunk connections		IP20	
Ambient temperature (operation)		-40 °C ... 80 °C		-50 °C ... 90 °C	
Max. permissible relative humidity (operation)		< 95 % (non-condensing)		< 95 % (non-condensing)	
Conformance/Approvals					
NE		NE21		NE21	
ATEX		DEMKO 16ATEX 1689X II 2(1) G Ex eb ib mb [ia Ga] IIC T4 Gb II (1D) [Ex ia Da] IIIC FISCO power supply (branch line)		Sira 13ATEX4247X; Ex II 3(3)G Ex nA [ic] IIC T4 Gc, Entity/FISCO ic branch lines Ex nA [nL] IIC T4 Gc; Ex II 3G Ex ic IIC T4 Gc, FISCO ic	
IECEx		IECEx UL 16.0114X Ex eb ib mb [ia Ga] IIC T4 Gb [Ex ia Da] IIIC FISCO power supply (branch line)		IECEx SIR 13.0089X; Ex nA [ic] IIC T4 Gc, Entity/FISCO ic branch lines; Ex nA [nL] IIC T4 Gc; Ex ic IIC T4 Gc, FISCO ic	
CSA, USA/Canada				Class I, Div. 2, Groups A, B, C, D; Ex nA [nL] IIC T4; Class I, Zone 2, AEx nA [nC] IIC T4	
FOUNDATION Fieldbus		FF-846		FF-846	

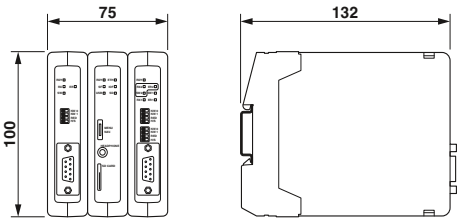
	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Fieldbus barrier, for FOUNDATION Fieldbus and PROFIBUS PA						
- 8 branch lines	**FB-8SP ISO**	2316311	1			
- 12 branch lines	**FB-12SP ISO**	2316312	1			
Device coupler, for FOUNDATION Fieldbus and PROFIBUS PA						
- 6 branch lines				**FB-6SP**	2316307	1
- 12 branch lines				**FB-12SP**	2316310	1

PROFIBUS DP to PROFIBUS PA coupler

The PROFIBUS DP to PA coupler link provides both a powerful and reliable interface to interconnect PROFIBUS DP into the process fieldbus network PROFIBUS PA.

- Integrated PA terminator
- 500 mA PA current
- Expandable to 9 PA modules
- Transparent data transfer
- Integrated webserver for configuration and diagnostics
- Integrated oscilloscope functionality

6 A power supply is recommended for applications where 2.5 A backplane current is exceeded.



Technical data

Supply		
Supply voltage range		10.8 V DC ... 26.4 V DC
Ethernet interface		
Description		10/100 Mbps Ethernet
Connection method		RJ45
General data		
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Dimensions	W / H / D	75 mm / 100 mm / 132 mm
Degree of protection		IP20
Ambient temperature (operation)		-20 °C ... 60 °C
Conformance/Approvals		
UL, USA/Canada		UL 508 Listed

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Coupler, with oscilloscope feature for PROFIBUS PA	**FB-HSB-DP/PA**	2316370	1
Coupler, with oscilloscope feature for PROFIBUS PA and PROFIBUS DP	**FB-HSB-DP-SC/PA**	2316381	1
Head station, with a PROFIBUS DP repeater, provides network diagnostics and an oscilloscope feature	**FB-HSB-DP-SC**	2316382	1

Accessories

Repeater, for PROFIBUS DP	**FB-DP-RPTR**	2316373	1
Repeater, for PROFIBUS DP, with oszilloscope	**FB-DP-RPTR/SC**	2316374	1
PROFIBUS PA interface module, with oscilloscope	**FB-PA/SC**	2316375	1
6 A power supply	**FB-HSP-PLUG/24DC/6A**	2316383	1
Head station, for monitoring up to four PROFIBUS networks	**FB-HSC**	2316371	1
Head station, for basic system functionality, no monitoring of PROFIBUS networks	**FB-HSA**	2316372	1

Each DIN rail-mounted fieldbus power supply provides high-integrity power for one H1 segment. Built-in output impedance allows digital communication and DC power to co-exist on a pair of wires.
– Electrically isolated
– Integrated termination resistor

FB-PS... modular redundant power supply
– Modular base, one per segment, eliminates unused capacity
– Swappable bases for increased plant integrity
– Compact width optimizes critical enclosure space
– Redundant power modules, with common conditioning in the base, provides greatest system performance and reliability
– Auto Current Balance technology enhances product life by closely sharing power between modules
– High efficiency including MOSFET outputs

4-channel redundant power supplies
– No additional monitoring of remote signaling required, as it is already integrated in the redundant configuration
– Compatible with major control systems from Yokogawa and Invensys
– Double the service life, thanks to even load distribution by means of ACB (auto current balancing) technology
– Local diagnostics via LEDs on the device as well as remote diagnostics via remote indication contact

Input data	
Nominal input voltage range	
Nominal current range	
Output data	
Output voltage range	
Output current	
Can be connected in parallel/series	
Max. power dissipation	
Signaling	
Signaling DC OK	
Signaling alarm	
Redundancy indication OK	
General data	
Dimensions	W / H / D
Degree of protection	
Ambient temperature (operation)	
Ambient temperature (storage/transport)	
Max. permissible relative humidity (operation)	
Conformance/Approvals	
ATEX	
IECEx	
CSA, USA/Canada	
NE	
EN	
Fieldbus Foundation	

Description
Power supply, modular redundant
- Plug, 28 V DC, 500 mA - Base
Redundant fieldbus power supply base
- Connection: D-SUB 25 socket connector - Connection: Invensys® D-SUB 25 cable - Connection: 2 Yokogawa AKB336 20pin cables
PCB connector, 5.0 mm pitch, color: black
PCB connector, 3.5 mm pitch, color: green
End cap

Power supply plug

Power supply base

Redundant fieldbus power supply base

Technical data

18.5 V DC ... 30.5 V DC		
700 mA ... 1.1 A	-	-
28 V DC ... 30 V DC (on the trunk)	-	-
500 mA	-	-
Yes / No	- / -	- / -
4 W (typical)	-	-
Green LED	-	-
Yellow LED	-	-
Green LED	-	-
17.5 / 117.6 / 115 mm	36 / 202.5 / 61.5 mm	180 / 77 / 180 mm
IP20	IP20 (when D-FB-PS is installed)	IP20
-40 °C ... 70 °C	-40 °C ... 70 °C	-40 °C ... 70 °C
-40 °C ... 85 °C	-40 °C ... 85 °C	-40 °C ... 85 °C
95 % (non-condensing)	95 % (non-condensing)	95 % (non-condensing)
Sira 11ATEX4216X; II 3 G Ex nA nC IIC T4 Gc	Sira 11ATEX4216X; II 3 G Ex nA nC IIC T4 Gc	Sira 11ATEX4216X; II 3 G Ex nA nC IIC T4 Gc
IECEx SIR 11.0097X; Ex nA nC IIC T4 Gc	IECEx SIR 11.0097X; Ex nA nC IIC T4 Gc	IECEx SIR 11.0097X; Ex nA nC IIC T4 Gc
Class I, Div. 2, Groups A, B, C, D; Ex nA nC IIC T4	Class I, Div. 2, Groups A, B, C, D; Ex nA nC IIC T4	Class I, Div. 2, Groups A, B, C, D; Ex nA nC IIC T4
Class I, Zone 2, AEx nA nC IIC T4	Class I, Zone 2, AEx nA nC IIC T4	Class I, Zone 2, AEx nA nC IIC T4
NAMUR NE 21	NAMUR NE 21	NAMUR NE 21
EN 61326	EN 61326	EN 61326
FF-831	FF-831	FF-831

Ordering data

Type	Order No.	Pcs./Pkt.
FB-PS-PLUG-24DC/28DC/0.5/EX	2316132	1

Ordering data

Type	Order No.	Pcs./Pkt.
FB-PS-BASE/EX	2316145	1

Ordering data

Type	Order No.	Pcs./Pkt.
FB-PS-MB-25DSUB/EX	2316146	1
FB-PS-MB-I/EX	2316149	1
FB-PS-MB-Y/EX	2316148	1

Accessories

Accessories

ZEC 1,5/ 4-LPV-5,0 C2,4 BK	1793260	50
ZEC 1,0/ 6-LPV-3,5 C1	1915699	50
D-FB-PS	2316226	10

Accessories

Field diagnostic modules for FOUNDATION Fieldbus

- Reads physical layer diagnostics in the field
- Segment voltage, noise and signal can be monitored
- Easy control system integration with DD and EDDL
- Adjustable alarm condition thresholds allow for precision monitoring and trending
- Diagnostics data for up to 24 field devices
- Two module types for easy integration across all system platforms

With terminal block for FF power supply and/or block coupler applications

Ex:

For modular device couplers mounted on TBUS

Ex:

		Technical data	Technical data
Supply			
Supply voltage range		9 V DC ... 32 V DC	9 V DC ... 32 V DC
Typical current consumption		27 mA	27 mA
Max. current consumption		29 mA	29 mA
Fieldbus interface			
Rated voltage		-	≤ 32 V
Rated current		-	29 mA
General data			
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12	- / - / -
Dimensions	W / H / D	17.7 mm / 93.9 mm / 70.4 mm	17.7 mm / 85 mm / 70.4 mm
Degree of protection		IP20	IP20
Ambient temperature (operation)		-40 °C ... 85 °C	-40 °C ... 85 °C
Max. permissible relative humidity (operation)		95 % (non-condensing)	95 % (non-condensing)
Conformance/Approvals			
FOUNDATION Fieldbus		FF-830	FF-830
EMC note		Class A product, see page 525	Class A product, see page 525

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs./Pkt.	Type	Order No.	Pcs./Pkt.
Field diagnostic module, for FOUNDATION Fieldbus						
	FB-DIAG/FF/LI	2316284	1	**FB-DIAG/FF/NC**	2316297	1

Surge protection for fieldbus systems

new

- One-piece or plug-in surge protection
- Tailored to the special requirements of intrinsically safe circuits
- Integrated mechanical status indicator

3-wire with common reference potential, intrinsically safe

Type 3 device protection (L, N, PE)

Description	Type	Order No.	Pcs./Pkt.
TERMITRAB complete, with screw connection technology			
- Nominal voltage U_N = 12 V DC, one-piece	**TTC-6-3-HF-F-M-EX-12DC-UT-I**	2906822	1
- Nominal voltage U_N = 24 V DC, one-piece	**TTC-6-3-HF-F-M-EX-24DC-UT-I**	2906823	1
- Nominal voltage U_N = 12 V DC, plug-in	**TTC-6P-3-HF-F-M-EX-12DC-UT-I**	2906826	1
- Nominal voltage U_N = 24 V DC, plug-in	**TTC-6P-3-HF-F-M-EX-24DC-UT-I**	2906828	1
MAINS-PLUGTRAB, consisting of a plug and base element			

Ordering data

Type	Order No.	Pcs./Pkt.
PLT-SEC-T3-24-FM	2905223	1

Ordering data

Accessories

- End bracket, ground and shield clamps (CLIPLINE)
- Terminal block bases that can be lined up next to each other in order to set up any number of positions
- Marking material

Clamps and terminal blocks

Marking materials

Description	Color	Type	Order No.	Pcs./Pkt.
End bracket, to snap on NS 35, 9.5 mm wide, can be labeled with ZB 6, ZB 8/27, KLM...	gray	**CLIPFIX 35**	3022218	50
		E/ME TBUS NS35 GY	2713780	50
Terminal block	gray	**UT 2,5**	3044076	50
Cover, width: 2.2 mm	gray	**D-UT 2,5/10**	3047028	50
Shrink sleeve, for conductor diameters 3.2 - 9.5 mm, 1 roll = 500 marker, à 30 mm long	white	**WMS 9,5 (30X16)R**	0800377	1
UniCard, for terminal blocks with a high marker groove, 32-section, 4 individual labels per strip, for a terminal block width of 16 mm	white	**UC-TM 16**	0819217	10
UniCard, for terminal blocks with a flat marker groove, 32-section, 4 individual labels per strip, for a terminal block width of 16 mm	white	**UC-TMF 16**	0819262	10

Ordering data

Ordering data

Modbus gateways for PROFIBUS DP/PA and FOUNDATION Fieldbus

Use the Modbus gateways to connect Modbus/RTU devices to the FOUNDATION Fieldbus, PROFIBUS DP and PROFIBUS PA process fieldbuses.

Features:

– Up to four Modbus/RTU devices supported with just one gateway
– Space savings with just 6 mm required per channel
– Easy installation and startup via software such as Siemens PDM or Pepperl+Fuchs PACTware DTM 1.2

Ex:

Technical data

		GW PL FF/MODBUS	GW PL DP/MODBUS
Supply			
Supply voltage range		18 V DC ... 30 V DC	
Max. current consumption		34 mA	60 mA
Serial port			
Data rate		31.25 kbps	9.6 kbps (min.)
Number of connections		1	2
Connection method		COMBICON	D-SUB 9, COMBICON
Serial port			
Designation		Modbus/RTU	
Data rate		115.2 kbps (max.)	
Number of connections		2	
Connection method		COMBICON	
General data			
Ambient temperature (operation)		-40 °C ... 85 °C	
Degree of protection		IP20	
Dimensions	W / H / D	22.5 mm / 114.5 mm / 99 mm	
Conformance/Approvals			
ATEX		PRESAFE 16ATEX7686X, II 3G, Ex nA IIC T4 Gc	
IECEx		IECEx PRE 16.0001X, Ex nA IIC T4 Gc	
UL, USA/Canada		Class I, Div. 2, Groups A, B, C, D Class I, Zone 2, AEx nA IIC T4, Ex nA IIC T4 GcX	
EMC note		Class A product, see page 525	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Protocol converter			
- Modbus/RTU to FOUNDATION Fieldbus	**GW PL FF/MODBUS**	2316363	1
- Modbus/RTU to PROFIBUS PA	**GW PL PA/MODBUS**	2316364	1
- Modbus/RTU to PROFIBUS DP	**GW PL DP/MODBUS**	2316365	1

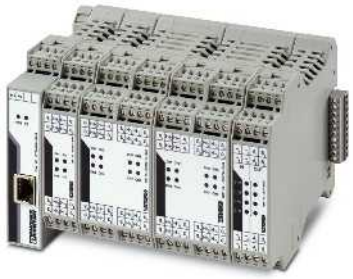
Ethernet HART multiplexer

Transmit critical HART process data over Ethernet networks with the multiplexer. In addition to th high Ethernet speed, benefit from the additional transmission of secondary process data.

The universal version also supports PROFINET in addition to Modbus/TCP and HART IP.

Features:

- Modular system enables scalable station configuration with up to five extension modules
- Connection of up to 40 HART devices per station
- In Modbus/TCP operation, the digital extension module enables additional digital I/Os to be acquired
- Monitoring and targeted response to active and passive process data with the aid of the digital inputs and outputs
- Parameterization via integrated web server
- Use of familiar software tools, thanks to HART IP protocol



Ex:

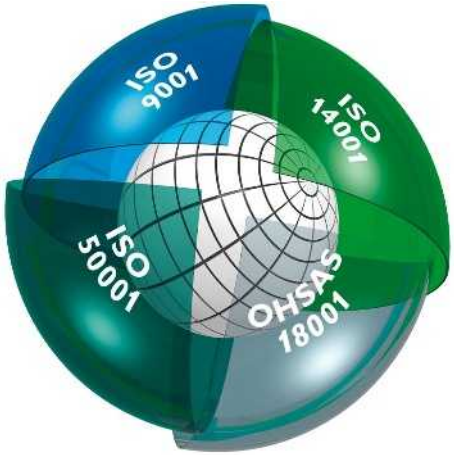
Technical data

		GW PL ETH/UNI-BUS	GW PL ETH/BASIC-BUS
Supply			
Supply voltage range		19.2 V DC ... 30 V DC	
Nominal current consumption		46 mA (at 24 V DC)	45 mA (at 24 V DC)
Max. current consumption		63 mA (at 24 V DC)	62 mA (at 24 V DC)
Ethernet interface			
Interface		Ethernet 10/100Base T	
Connection method		RJ45 socket, auto negotiation and auto crossing	
Supported protocols		Modbus/TCP, HART IP, PROFINET	TCP/IP, HART IP, Modbus/TCP
General data			
Ambient temperature (operation)		-40 °C ... 70 °C	
Degree of protection		IP20	
Electromagnetic compatibility		Conformance with EMC Directive 2004/108/EC	
Dimensions	W / H / D	22.5 mm / 114.5 mm / 99 mm	
Conformance/Approvals			
ATEX		II 3 G Ex nA IIC T4 Gc DEMKO 16ATEX1749X	
IECEx		IECEx ULD 16.0033X Ex nA IIC T4 Gc	
UL, USA/Canada		Class I, Div. 2, Groups A, B, C, D	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet head station, for modular gateway, supports five expansion modules			
- with Modbus/TCP, HART IP, PROFINET	**GW PL ETH/UNI-BUS**	2702233	1
- with Modbus/TCP, HART IP	**GW PL ETH/BASIC-BUS**	2702321	1
Extension module			
- HART, passive, 4x AI or AO	**GW PL HART4-BUS**	2702234	1
- HART, passive, 8x AI or AO	**GW PL HART8-BUS**	2702235	1
- HART, active, 8x AI	**GW PL HART8+AI-BUS**	2702236	1
- Modbus/TCP, active, 4x DI and 4x DO	**GW PL DIO4-BUS**	2702237	1

Quality in quantity



Integrated management system

The objective of the Phoenix Contact integrated management system is to integrate all requirements pertaining to products, processes, and the organization.

Statutory and regulatory requirements, as well as those of international standards and our customers, are met and, in some cases, even exceeded in all phases of the product lifecycle.

The Phoenix Contact management system is monitored by internationally recognized independent bodies each year to ensure that quality, environmental protection, energy efficiency, and occupational safety have been integrated in conformance with the relevant requirements. Certification in accordance with international standards ISO 9001, ISO 14001, ISO 50001, and BS OHSAS 18001 is the result of our corporate philosophy of meeting the needs of our customers, staff, and environment as best as possible. They serve as the basis for innovative products with the familiar high Phoenix quality standard, actively practiced environmental protection through efficient production and products that conserve resources, and responsibility in the field of occupational health and safety. It goes without saying that we integrate all further requirements of standards, international approvals or special customer requirements into our company processes.

The result of this system is a building block for the success of the Phoenix Contact Group as well as its products and services.

CE marking

CE marking was introduced as an important instrument for the free movement of goods within the European single market. By applying the mark to a product, the manufacturer confirms its compliance with all EU directives applicable to this product. The EU directives describe the product characteristics with regard to device safety and the avoidance of risks. These are legally binding regulations of the European Union (EU), which means that the fulfillment of these requirements is a **legal prerequisite for the marketing of these products within the EU**.

Where applicable, our products currently fall within the scope of the following directives:

– 2014/35/EU
  Electrical equipment designed for use within certain voltage limits (Low Voltage Directive)
– 2014/30/EU
  Electromagnetic compatibility (EMC Directive)
– 2014/32/EU
  Measuring instruments
– 2006/42/EC
  Safety of machinery (Machinery Directive)
– 2014/34/EU
  Equipment and protective systems intended for use in potentially explosive atmospheres (ATEX Directive)
– 1999/5/EC
  Radio Equipment and Telecommunications Terminal Equipment Directive (R&TTE)
– 2014/53/EU
  Radio equipment (RED)
– 2011/65/EU
  RoHS Directive

The standards used as the basis for the aforementioned directives have been at the heart of our development standard for some time as a way of ensuring compliance with European directives. The numbers of the directives indicate their version at the time of publication. In the event of changes to directives and/or standards, our products will undergo conformity assessment again in good time and a new declaration of conformity will be issued promptly. The current declarations for each product can also be found in our download area.

Among the aforementioned European directives, the EMC Directive plays a particularly important role. It uses a legally binding directive as the basis for defining electromagnetic compatibility as a fundamental device property. European legislation therefore places great emphasis on the electromagnetic compatibility of devices and systems as a basic prerequisite for the error-free operation of machines and systems. As an international leader in the field of surge protection, Phoenix Contact has extensive expertise in EMC. This expertise and the experience gained over many years in the development and application of industrial interface and communication technology have resulted in an extremely high standard of quality for our products when it comes to electromagnetic compatibility. Our sister company, Phoenix Testlab, was founded in order to share this expertise with other companies. Phoenix Testlab GmbH is an independent, accredited service company, which carries out EMC testing in compliance with the European standards. At Phoenix Testlab, devices are also tested with regard to their electrical safety, mechanical influences, and their behavior in relation to environmental influences. Phoenix Testlab is also a notified body according to EMC Directive 2014/30/EU, R&TTE Directive 1999/5/EC for radio equipment and telecommunications terminal equipment, and Radio Equipment Directive (RED) 2014/53/EU. As a certification body (TCB, FCB, and RCB), Phoenix Testlab is also able to approve these products for the markets in the USA, Canada, and Japan.

Standards and regulations

All relevant standards and regulations are used as the basis for the development and maintenance of our products.

International standards are subject to continuous changes as a result of harmonization and new developments. In line with this process, the current version of all standards that are relevant to our products is documented in the product area on our website at **phoenixcontact.net/products**.

Online product information service on the world wide web

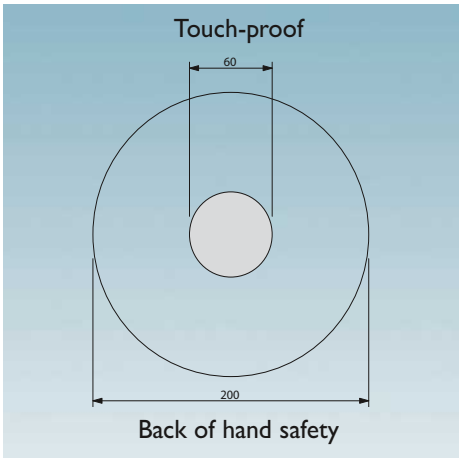
Phoenix Contact is continuously extending its product range.

Within the scope of our product monitoring obligation, all products are subject to an improvement process.

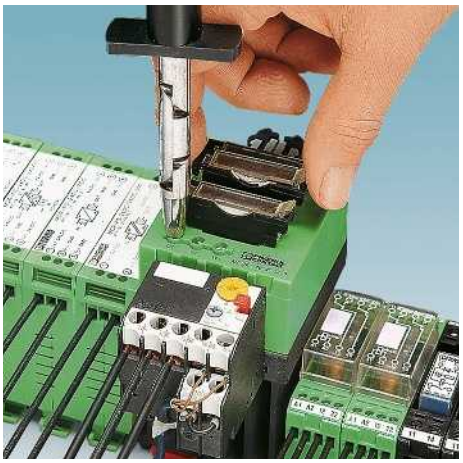
The Internet is an ideal platform to quickly communicate new product developments and improvements to the market.

You can quickly access the relevant Phoenix Contact website for your region via phoenixcontact.com. There you will always find an up-to-date overview of products, solutions, and services from Phoenix Contact. This includes technical documents such as data sheets and user manuals, current driver and demo software, and a direct link to the relevant contact person.

Touch proofness



Example: pressure actuation



Finger safety

Back of hand safety

The accident prevention regulations BGV A 2 issued by the German employer's liability insurance association for precision mechanics and electrical engineering apply to the operators of electrical systems and are aimed at the prevention of electrical accidents by means of special safety requirements.

These regulations contain specifications regarding the safety distances for work, operation, and occasional handling in the proximity of "live parts" in low-voltage systems up to 1000 V ~ or 1500 V –.

– Work with live parts is only permitted once they have been de-energized. Operational activities are only permitted in the vicinity of live parts if these parts are de-energized or are protected against direct contact (§ 6). The following safety measures apply when working in the vicinity of live parts:
– Provision of the de-energized state for the duration of the work
– Ensure shock protection is in place in the form of covers or barriers during the work
– Assurance that proximity limits will not be violated (§ 7)

The term "occasional handling" has been introduced for the operation of elements such as pushbuttons, rocker arms or rotary buttons in the proximity of live parts.

In VDE 0105-1, this is covered by "operation with partial protection against direct contact".

Detailed specifications for "occasional handling" can be found in DIN VDE 0106-100. This specifies to what degree live parts in the proximity of operating elements are to be protected against contact. The basis for this is the definition of a "protection area for occasional handling"; this is the area into which the user must reach in order to handle the machine.

The most important thing is that an area formed by an even envelope curve 30 mm in radius must surround the live parts. This area must be **touch-proof**, i.e., the live parts of the electrical device must not be within reach of the VDE test finger according to IEC 60529/DIN VDE 0470-1 (test finger).

Back of hand safety is specified for the "rest of the area" up to 100 mm around the operating element. **Back of hand safety** means that when a force of 50 N is applied to a ball with a diameter of 50 mm, this does not come into contact with the live parts of the equipment. No special measures for ensuring contact safety are stipulated outside this area.

Note: Systems and equipment that are operated with SELV up to 25 V ~ or 60 V – are considered to be protected against "direct contact".

According to § 5, Subsection 4 of the BGV A 2 regulations, there is no need to test the condition of the system prior to initial startup if the company has confirmation from the manufacturer or installer that the electrical systems and equipment conform to BGV A 2. The confirmation required relates to systems and equipment that have been installed and are ready for operation and can only be issued by the installer or installation company. The manufacturer of the electrical equipment can only issue a confirmation that products have been produced in accordance with the relevant electrotechnical DIN VDE regulations stipulated in BGV A 2. The installer must bear this in mind when selecting the equipment to be used.

In the field of connection technology, Phoenix Contact offers a wide range of products which are touch-proof or can be protected against contact by means of covers. Depending on the conditions, all of this must be taken into account when selecting the individual types of terminal blocks and accessories.

Quality features of insulating housings

Thermoplastics

The majority of our insulating housing is made from thermoplastic materials. Roughly speaking, these can be divided into amorphous and semi-crystalline substances. Thermoplastics are processed using the efficient and environmentally-friendly injection molding process. They have good recycling properties and can be re-used. We use many materials that are modified in different ways to meet the demanding requirements that electrical and electronic modules, devices, and systems have to meet with regard to their mechanical, thermal, and electrical properties.

Behavior of plastics under the influence of temperature (operating temperatures, mechanical influences)

All plastics undergo a process referred to as thermal aging when they are subjected to heat over long periods. This process causes changes in the mechanical and electrical properties of the material. External influences, e.g., radiation, additional mechanical, chemical or electrical stresses, amplify this effect. Special tests on samples can yield characteristic data which provides a good means of drawing comparisons between different plastics. However, applying these characteristics to an evaluation of molded plastic parts is only possible to a limited extent, and can only give the designer a rough guide when it comes to selecting a plastic material. This catalog uses the following assessment criteria: the **RTI value** according to UL746B/ANSI 746 B (elec. based on electric strength) and the **Ti value** according to IEC 60216-1 (based on a 50% reduction in tensile strength after 20,000 hours).

IEC 60947-7-1/EN 60947-7-1 specifies a permissible temperature increase of 45 K for terminal blocks under nominal load. Phoenix Contact terminal blocks fulfill this requirement.

The properties of plastics are not only affected by the influence of heat as described above; they also undergo changes as a result of cold influences. When subjected to cold as well as low levels of humidity, plastics become increasingly brittle with the result that they are no longer capable of withstanding the same mechanical loads. As the table on the right shows, the plastics concerned can be used down to a temperature of -40°C, but only without a mechanical load. As far as the products presented in the catalog are concerned, it is the ambient temperature specified in each case that is to be regarded as definitive for operation. Regardless of the plastics used, this may be subject to further restrictions (e.g., limited to -20°C) as a result of the components used or other restrictive parameters.

At very low temperatures, this means that any form of mechanical load on the plastic components must be avoided (e.g., mounting of products on/removal of products from the DIN rail, actuation of terminal points, locking/ejection of relays from bases, prizing out of jumpers, bending of cables and lines, etc.), as there is always an associated risk of damage. Unless otherwise indicated, it is recommended that you carry out the specified mounting/operational tasks in a temperature range from -10°C to +40°C.

Inflammability characteristics of plastics (UL 94)

The inflammability tests for plastics have been defined by the Underwriters Laboratory (USA) in regulation UL 94. This applies to all areas of application, particularly in electrical engineering. A horizontal or vertical test is carried out at the test laboratory to determine the inflammability of the plastic material with a naked flame. In order of increasing flame-retardant behavior, the evaluation classes are HB, V2, V1, V0, and 5V. Test results are recorded on "yellow cards" and are published annually in the **Recognized Component Directory.**

Thermoplastics: non-reinforced polyamide, PA

We use the modern, semi-crystalline polyamide insulation material, which has now become an essential component in electrical engineering and electronics. It has long occupied a leading position and is authorized for use by the relevant approval authorities such as the CSA, NEMKO, KEMA, PTB, SEV, UL, VDE, etc.

Polyamide has excellent electrical, mechanical, chemical, and other properties even at high operating temperatures. Brief peak temperatures of up to approximately 200°C are permitted as a result of heat aging stabilization. Depending on the type (PA 4.6, 6.6, 6.10, etc.), its melting point is in the region of 215°C to 295°C.

Polyamide absorbs moisture from its surroundings, on average 2.8%. This is not the embedded water of crystallization, however, but rather chemically bound H_2O groups in the molecular structure. This makes the plastic flexible and resistant to breakage, even at temperatures as low as -40°C. PA belongs to flammability rating V2 to V0 according to UL 94.

Thermoplastics: Polyester, PBT

We use the semi-crystalline thermoplastic polyester in non-reinforced and fiberglass-reinforced variants for special applications which require increased dimensional and form stability.

Apart from the high operating temperature, the material is characterized by excellent mechanical strength and hardness. Polyester does not absorb moisture from its surroundings. Therefore, PBT is particularly suitable for strips, for example, that are soldered onto PCBs and are subsequently required to pass a burn-in test where they are subjected to the influence of heat. PBT belongs to flammability rating V2 to V0 according to UL 94.

Thermoplastics: polycarbonate, PC

Polycarbonate combines many advantages such as rigidity, impact strength, transparency, dimensional stability, good insulation properties, and resistance to heat.

The amorphous material only absorbs moisture to a very limited degree, and is used for items such as large, rigid electronic component housings.

In its transparent form, polycarbonate is particularly suitable for use as a material for cover profiles or marking materials.

PC has good resistance properties against mineral acids, saturated aliphatic hydrocarbons, gasoline, greases, and oils.

This material is not very resistant to solvents, benzene, alkalis, acetone, and ammonia. Strain cracks may result from contact with certain chemicals.

PC belongs to flammability rating V2 to V0 according to UL 94.

Thermoplastics: polycarbonate fiber-reinforced, PC-F

Compared to non-reinforced materials, fiber reinforced polycarbonates feature greater rigidity, impact strength, and operating temperature. In other respects, their properties are largely identical to those of non-reinforced polycarbonate.

Thermoplastics: ABS

We use the thermoplastic molding compound ABS for products which must have good impact and notched impact properties in addition to high mechanical stability and rigidity. The products are resistant to chemicals and stress cracking due to their special surface quality and hardness.

The characteristic thermal properties provide good dimensional stability at both low and high temperatures. Products made from ABS can be coated with metallic surfaces, e.g., nickel.

The flammability rating of the molding compound used is HB to V0 according to UL 94.

Properties	Unit/level	Polyamide PA	Polyester PBT	Polycarbonate PC	Polycarbonate PC-F	ABS
Operating temperature RTI */**	°C	≤ 105	≤ 105	≤ 125	≤ 120	≤ 80
Minimum temperature (without mechanical load)	°C	-40	-40	-40	-40	-40
Electric strength IEC 60243-1/DIN VDE 0303-21	kV/cm	600	400	> 300		850
Resistance to creepage IEC 60112/DIN VDE 0303-1	CTI...M	550	225	175		200
	CTI...	600	225	175	175	600
Tropical and termite resistance		Good	Good	Good		
Specific contact resistance IEC 60093/VDE 0303 Part 30; IEC 60167/VDE 0303 Part 31	Ω cm	10^{12}	10^{16}	> 10^{16}	> 10^{14}	10^{14}
Surface resistance IEC 60093/VDE 0303 Part 30; IEC 60167/VDE 0303 Part 31	Ω	10^{10}	10^{13}	> 10^{14}		10^{13}
Flammability rating according to UL 94		V2-V0	V0	V2-V0	V0	HB-V0

* According to UL 746 B/ANSI 746 B (elec.) ** Minimum value

Dimensions

Dimensions: Width/**H**eight/**D**epth

The dimensions "**W**idth/**H**eight/**D**epth" are defined as follows for all DIN-rail-mountable products:

– **W**idth: measurement taken along the DIN rail
– **H**eight: measurement taken across the DIN rail
– **D**epth: measurement taken starting from the mounting plate and including the DIN rail NS 35/7,5 (EN 60715)

The width, height, and depth never change, even if the products shown in this catalog happen to be photographed from two different perspectives (horizontal or vertical).

To make things easier for you, one of the two symbols shown above has been included next to each product photo.

EMC: Class A product:

In accordance with statutory regulations, our products are indicated with this footnote if they are intended for use in industrial environments. This means that the permitted limit values for residential applications may be exceeded in the event of conducted and emitted disturbance variables. In such cases, the operator may have to take additional safety measures in order to ensure electromagnetic compatibility in residential applications.

Note:

Subject to changes that serve the purpose of technical progress.

Connection cross section

The rated cross section of terminal blocks must be specified by the manufacturer according to IEC 60947-7-1. The rated cross section is the maximum conductor cross section that can be connected in single, multi or fine-strand versions subject to specific thermal, mechanical, and electrical requirements.

The manufacturer must also specify the **rated connection capacity**, i.e., the area of connectable conductors as well as the number of conductors which can be connected simultaneously and the necessary preparation of the conductor ends. The conductors can be **solid (single or multi-strand)** or flexible **(fine-strand)**.

These values can be found in the product-specific technical data.

The rated connection capacity of Phoenix Contact terminal blocks usually exceeds standard requirements, which specify that it must only be possible to connect one conductor with one of the two next smallest cross sections, excluding the rated cross section (standardized for the cross section range from 0.2 to 35 mm²).

In addition, conductors with a rated cross section can usually be wired with ferrules with plastic sleeve.

Phoenix Contact terminal blocks are designed to allow copper conductors to be connected to them untreated. "Special treatment" or the use of ferrules – both permitted according to IEC 60947-7-1 – are not required. If ferrules are nevertheless used to protect stranded conductors against splicing, the connection capacity of the stranded conductor is generally reduced by one level.

Structure and dimensions of connecting cables

Cross section	Single-stranded		Multi-stranded		Fine-stranded		American Wire Gauge [AWG]							
	Diameter max. dimension	Number of wires	Diameter max. dimension	Number of wires (minimum number)	Diameter max. dimension	Number of wires (guide value)	Gauge no.	Solid wires			Stranded wires			
[mm²]							AWG	[Ø mm]	[circ. mils]	[mm²]	[Ø mm]	[circ. mils]	[mm²]	
0.2	0.5	1	–	–	–	–	24	0.51	404	0.21	–	–	–	
0.5	0.9	1	1.1	7	1.1	16	20	0.81	1022	0.52	0.97	1111	0.56	
0.75	1.0	1	1.2	7	1.3	24	18	1.02	1620	0.82	1.16	1600	0.82	
1	1.2	1	1.4	7	1.5	32	(17)	1.15	2050	1.04	–	–	–	
–	–	–	–	–	–	–	16	1.29	2580	1.31	1.50	2580	1.32	
1.5	1.5	1	1.7	7	1.8	30	(15)	1.45	3260	1.65	–	–	–	
–	–	–	–	–	–	–	14	1.63	4110	2.08	1.85	4100	2.09	
2.5	1.9	1	2.2	7	2.3	50	(13)	1.83	5180	2.63	–	–	–	
–	–	–	–	–	–	–	12	2.05	6530	3.31	2.41	6500	3.32	
4	2.4	1	2.7	7	2.9	56	(11)	2.30	8230	4.17	–	–	–	
–	–	–	–	–	–	–	10	2.59	10380	5.26	2.95	10530	5.37	
6	2.9	1	3.3	7	3.9	84	(9)	2.91	13100	6.63	–	–	–	
–	–	–	–	–	–	–	8	3.26	16510	8.37	3.73	16625	8.48	

Tightening torque of terminal block screws

IEC 60947-1/EN 60947-1, modified, Table 4 specifies tightening torques for screw connections based on the screw size for electrical and mechanical type tests.

Extract from IEC 60947-1/EN 60947-1, Table 4

The torque according to IEC and the recommended torque for Phoenix Contact terminal blocks are specified

Thread	Head screw with slot	
	Torque	Recommended tightening torque
	[Nm]	[Nm]
M2.5 (M2.6)	0.4	0.4 - 0.5
M3	0.5	0.5 - 0.6
M3.5	0.8	0.8 - 1.0
M4	1.2	1.2 - 1.5

Current carrying capacity

Standard IEC 60947-7-1/EN 60947-7-1/ DIN VDE 0611-1 specifies the test currents for the individual conductor cross sections listed in the adjacent table. The corresponding currents are listed with the connection data for the individual terminal blocks. The type tests of terminal blocks are based on this data.

Test currents according to IEC 60947-7-1/EN 60947-7-1, Table 5

Rated cross section	[mm²]	0.2	0.5	0.75	1.0	1.5	2.5	4	6	10	16
Test current	[A]	4	6	9	13.5	17.5	24	32	41	57	76

Certification bodies and safety marks

Certification bodies and approvals		Country code
CB scheme	IECEE CB Scheme (in combination with certifying body)	Interna-tional
CCA	CENELEC Certification Agreement (CCA inspection report) (in combination with certifying body)	EU
	Canadian Standards Association (CSA)	CA
	Canadian Standards Association (CSA) - CSA approval for the USA -	US
	Canadian Standards Association (CSA) Combined logo - CSA approval for Canada and the USA -	CA US
	Underwriters Laboratories Inc. (UL)	US
	Underwriters Laboratories Inc. (UL) - UL approval for Canada -	CA
	Underwriters Laboratories Inc. (UL) Combined logo - UL approval for the USA and Canada -	US CA
	INSIEME PER LA QUALITA'E LA SICUREZZA	IT
EAC	Eurasian Conformity	BY KZ RU
KEMA KEUR	DEKRA Certification B.V.	NL
ÖVE	Österreichischer Verband für Elektrotechnik	AT
SEV	electrosuisse SEV Verband für Elektro-, Energie- und Informationstechnik	CH
VDE	Verband Deutscher Elektrotechniker e.V. (VDE) – Approval of drawings – Reports with production monitoring	DE
DGUV TEST	Berufsgenossenschaft (BG) GS Tested safety	DE
Intertek	Intertek ETL Listed - Approval for the USA -	US
Intertek	Intertek ETL Listed - Approval for Canada -	CA
Intertek	Intertek ETL Listed - Approval for the USA and Canada -	US CA
TÜV	TÜV Rheinland Industrie Service GmbH	DE
CCC	China Compulsory Certification	CN
KC	Korea Communications Commission	KR

Explosion protection		Country code
IEC IECEx	International Electrotechnical Commission	Interna-tional
Ex	ATEX Directive	EU
DEKRA	DEKRA Certification B.V.	NL
PTB	Physikalisch-Technische Bundesanstalt	DE
kiwa	KIWA Nederland B.V.	NL
VTT	VTT Expert Services Oy	FI
IBExU	IBExU Institut für Sicherheitstechnik GmbH	DE
UC	TÜV Rheinland do Brasil	BR
TÜV NORD	Technischer Überwachungsverein Nord	DE
DEKRA	DEKRA EXAM GmbH	DE
	Canadian Standards Association (CSA)	CA
	Canadian Standards Association (CSA) - CSA approval for the USA -	US
	Canadian Standards Association (CSA) Combined logo - CSA approval for Canada and the USA -	CA US
	Underwriters Laboratories Inc. (UL)	US
	Underwriters Laboratories Inc. (UL) - UL approval for Canada -	CA
	Underwriters Laboratories Inc. (UL) Combined logo - UL approval for the USA and Canada -	US CA
FM APPROVED	FM Approvals	US
EAC Ex	Eurasian Conformity for Ex-products	BY KZ RU

Marine classification societies		Country code
DNV GL	DNV GL - MARITIME	DE
BUREAU VERITAS	Bureau Veritas	FR
GL	Germanischer Lloyd AG	DE
Lloyd's Register	Lloyd's Register of Shipping	GB
ClassNK	Nippon Kaiji Kyokai	JP
DNV	Det Norske Veritas	NO
	Polski Rejestr Statków	PL
	Russian Maritime Register of Shipping	RU
KR KOREAN REGISTER	Korean Register of Shipping	KR
ABS	American Bureau of Shipping	US

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