



# Intelligent monitoring system

ImpulseCheck – Clear insight into your system

# Keeping the pulse of your system – Monitoring for your surge protection

ImpulseCheck is the world's first intelligent assistance system for surge protection in the field of mains protection. The module allows you to measure the state of health (SoH) of every single protective device via cloud connection and provides new digital services.

## COMPLETE line

The new standard for the control cabinet. More information on pages 14 to 15.

## Sensors

Suitable for mounting on cables with various cross sections

### Did you know...

that surge voltages can overload electrical installations and the protective devices intended to protect them? With ImpulseCheck, you always have an insight into the state of your system and surge protection, before failures occur.



## Remote indication contact

Query the status indicator for surge protection

## Power supply

24 V DC supply to the ImpulseCheck module

## Status indicators

- Supply voltage
- PROFICLOUD connection
- Configuration mode
- State of health (SoH) of each channel

## Multifunctional button

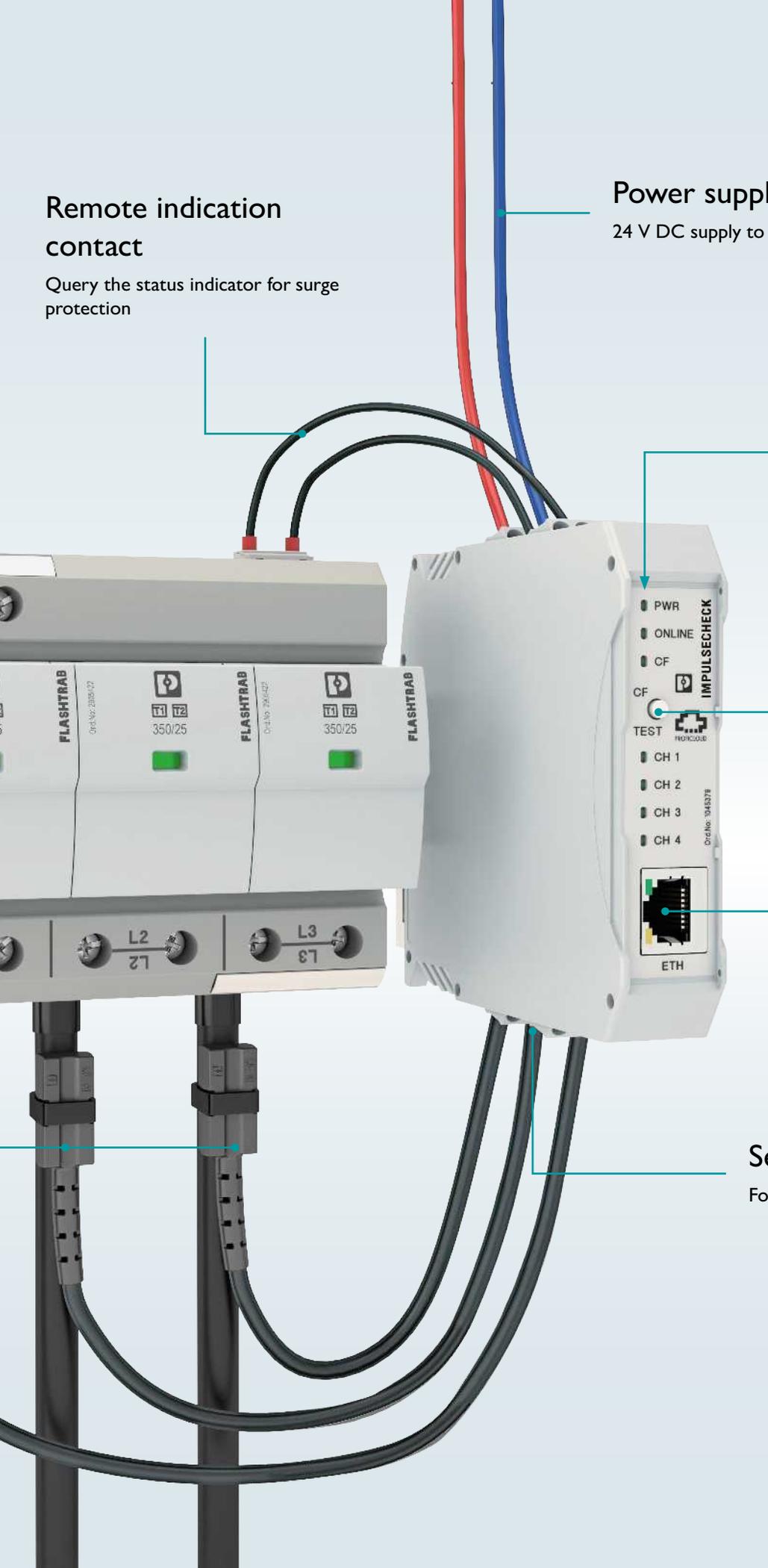
Connection test, configuration, and reset

## Ethernet connection

For connecting to PROFICLOUD

## Sensor connections

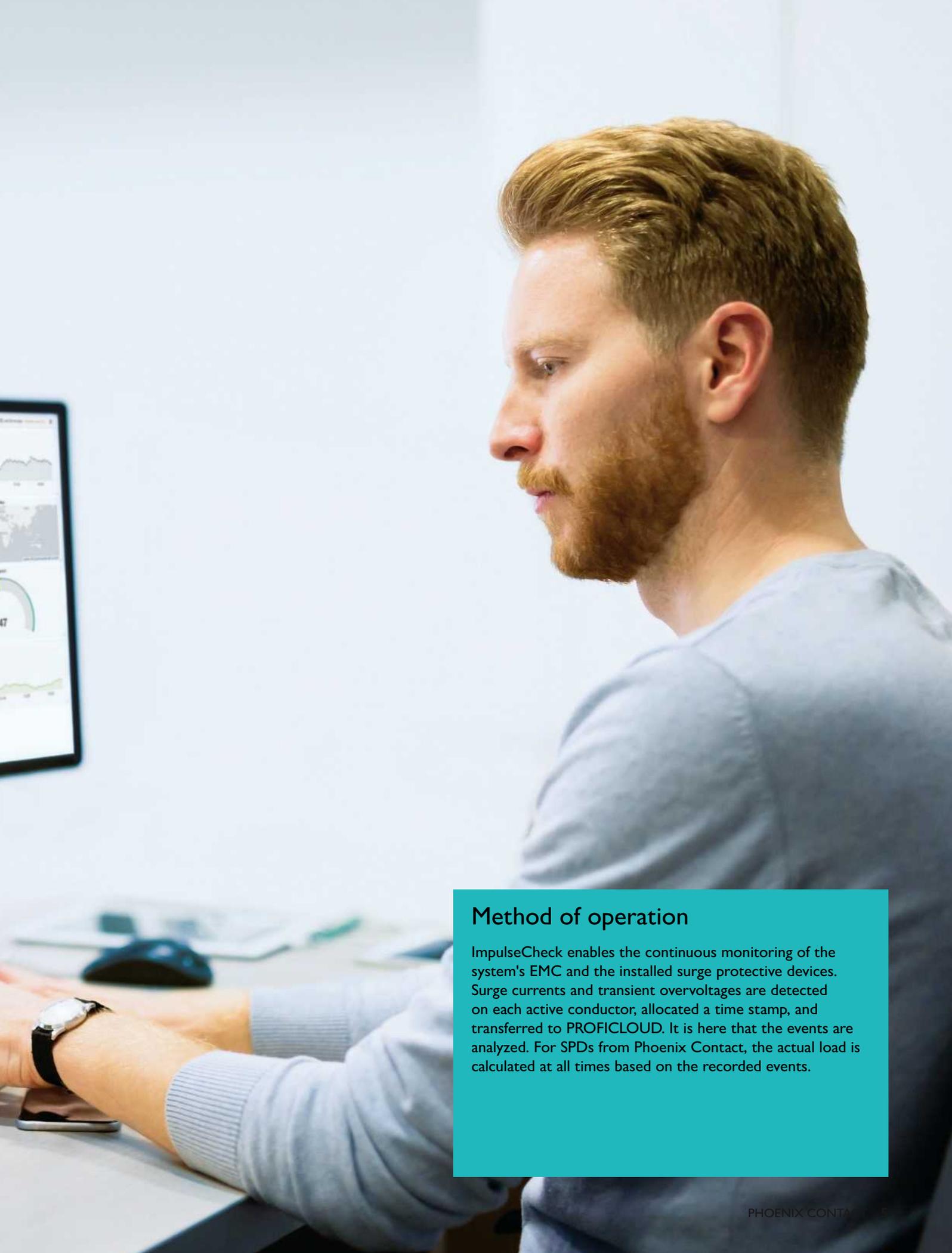
For up to four sensors



# Keeping the pulse of your system

Benefit from predictive maintenance: thanks to real-time measurement of surge currents and transient overvoltages, you can continuously monitor the condition of the system and the surge protection. This makes the remaining service life expectancy (state of health – SoH) of the protective devices transparent, so that maintenance services become more predictable.





## Method of operation

ImpulseCheck enables the continuous monitoring of the system's EMC and the installed surge protective devices. Surge currents and transient overvoltages are detected on each active conductor, allocated a time stamp, and transferred to PROFICLOUD. It is here that the events are analyzed. For SPDs from Phoenix Contact, the actual load is calculated at all times based on the recorded events.

# Status reports at the push of a button

Depending on the system type, the IEC 62305-3 standard requires that surge protective devices are tested at specific intervals. Thanks to real-time monitoring, you know the SPD's state and can generate status reports at any time at the push of a button – even between the predetermined test intervals. Thus you are perfectly informed, whenever you want.

## Information always at your fingertips

It is not possible to determine whether an overload caused by surge currents or transient overvoltages has occurred on a SPD since it was installed by simply carrying out a visual inspection. Using ImpulseCheck, these events are recorded for Phoenix Contact SPDs and analyzed so that the SoH for each individual mode of protection can be calculated.



Last status report retrieved on: 27.10.2016  
Result: SPD in fully functional condition without restrictions according to test and maintenance criteria according to IEC 62305-3.

$U_c$ : 350 V AC  
 $I_{imp}$ : 25 kA  
 $U_p$ : 1,5 kV

Current SPD status: Functional, replacement recommended (yellow)  
L1-N: Fully functional (green)  
L2-N: Fully functional (green)  
L3-N: Functional, replacement recommended (yellow)  
N-PE: Fully functional (green)

Detected surge currents/voltage impulses/bursts:  
12% Low-energy voltage impulses/bursts  
63% Surge currents  $I < 5$  kA  
24% Surge currents  $5kA \leq I < 10$  kA  
01% Surge currents  $I > 10$  kA

Estimated remaining service life expectancy (State of Health):

L1-N: 00%  
L2-N: 50%  
L3-N: 23%  
N-PE: 00%  
80%

Result: SPD in functional condition according to test and maintenance criteria according to IEC 62305-3, replacement recommended.

Status report  
Efficiency of surge protection devices

03.11.2017  
Phoenix Contact GmbH & Co. KG  
Marktplatz 8  
D-42699 Solingen  
Germany  
Tel: +49 (0)212 4503-0  
Fax: +49 (0)212 4503-250  
E-Mail: phoenix@phoenixcontact.com  
www.phoenixcontact.com

without  
IEC 62305-3

## Using digital added values and services

The cloud-based analysis of measured values enables completely new automated processes. Combine the values of the overvoltage events in the cloud, e.g. with local weather data or location information. Use this information for your logistics or export the data for your own evaluation.





## Exploring new paths

The REST-API interface enables you to read all data and process it further from the ImpulseAnalytics application. This opens up a whole host of new possibilities: from the automated ordering of replacement plugs for damaged surge protective devices to digital business models for maintenance and servicing.

# Networked surge protection

As a safety-related component, surge protection is an integral element of industrial systems and commercial installations. It is very important to have information about its status and performance capabilities. ImpulseCheck acquires this information and enables it to be utilized in the Internet of Things.

0 0 1 0 1

0 0 0 1 1

0 0 0 1 1 1 0 1 0 0 1



## Function

The assistance system for surge protection enables the continuous monitoring of the system's EMC and the installed surge protective devices (SPDs).



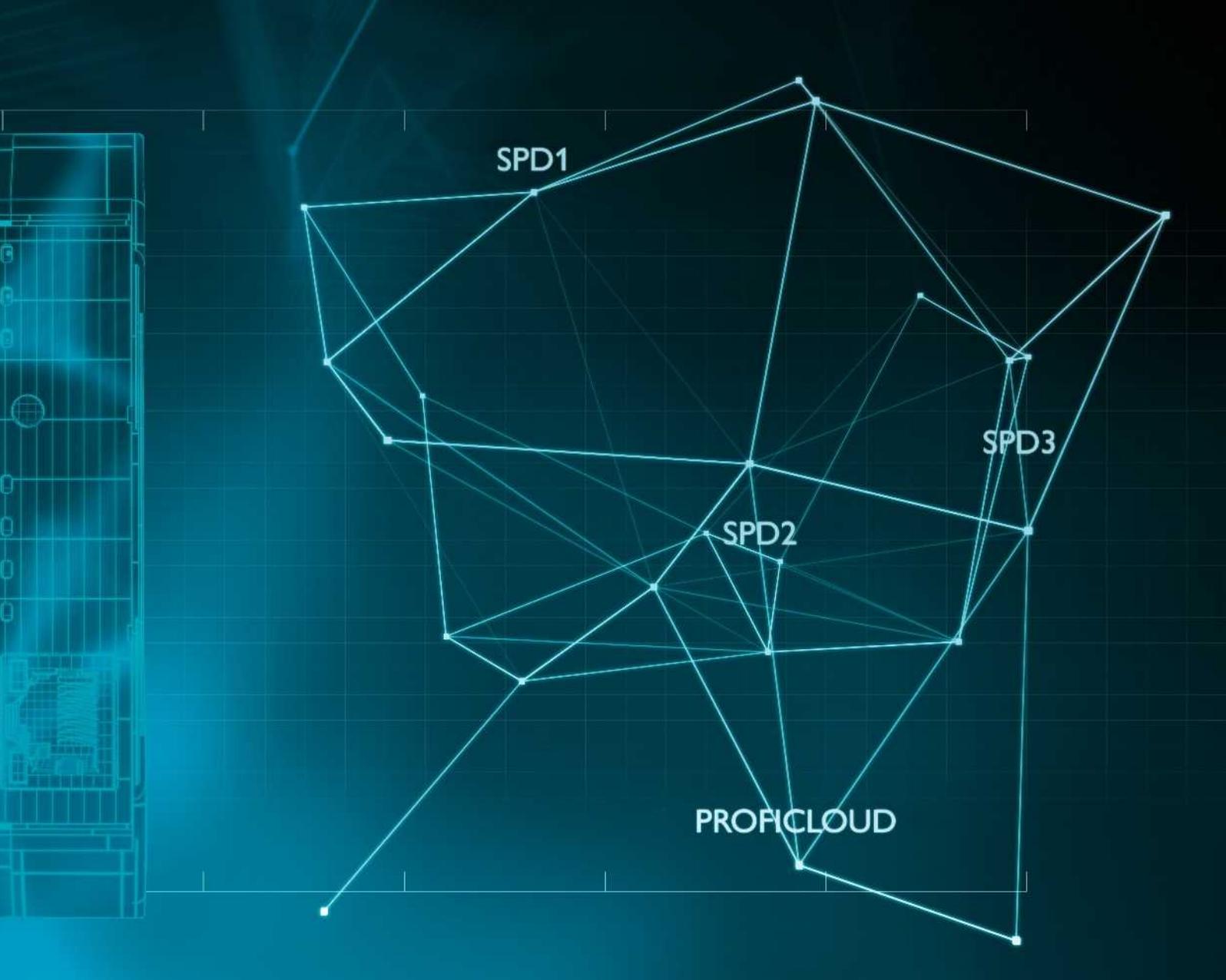
## Connection

ImpulseCheck monitors up to four sensors that are connected to the active conductors of a SPD. The measured values are transferred to PROFICLOUD.



## Configuration

All network settings relevant for communication with PROFICLOUD are made via a web server that is activated manually on the device.



### PROFICLOUD

The surge protective device and ImpulseCheck are configured in PROFICLOUD. Important for the SoH: the installation date.



### Security

TLS 1.2 (Transport Layer Security) encryption and authentication is used for all data transmission between ImpulseCheck and PROFICLOUD.



### Availability

Access protection, modern encryption technologies, plus redundant servers and automatic backups ensure the highest level of availability.

# ImpulseAnalytics – The application in PROFICLOUD

The ImpulseCheck module, the necessary sensors, and the ImpulseAnalytics application in PROFICLOUD together form the first assistance system for surge protection. Through its interaction with a powerful surge protection concept, this system provides optimum protection and maximum availability for your system.



# The ImpulseAnalytics application

## Method of operation

While the hardware records the measured data with a very high temporal resolution, the data is evaluated in the application.

### Information from the system

High-energy surge currents and transient overvoltages are detected reliably. High-energy and high-frequency events that can cause damage to surge protective devices or electrical installations are identified. The state of the installation and the protective devices becomes clear. You can take action before these events result in a system failure.

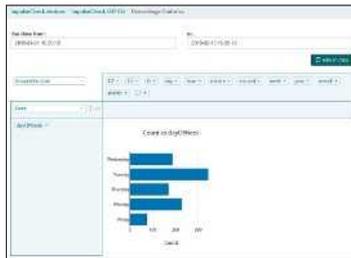
The screenshot shows the 'ImpulseCheck G37 EG' interface. At the top, it displays device information: 'Endurance Test G37 EG', 'PHOENIX CONTACT GmbH & Co. KG', 'Flachmannstrasse 8', 'D-33095 Bielefeld', 'G37 EG Profitek 1', and 'Max Mustermann'. Below this, it lists the 'Arrester: FLT-SEC-T1+T2-3S-350/25-FM'. A table shows the status of four sensors (1-4) with columns for Status, Sensor channel, Protection path, Plug type, Installation date, and transient overvoltage count. Sensor 1 is green (fully functional), sensor 2 is green, sensor 3 is yellow (functional, replacement recommended), and sensor 4 is red (disconnected, replacement required). Below the table, there are sections for 'Surge Current List' and 'Transient Overvoltage List'. The 'Transient Overvoltage List' shows three entries with columns for Timestamp, Information (Amplitude, Charge, Spec. Energy), and Actions. A search bar and navigation controls are also visible.

Information regarding the installed surge protection

State of health (SoH):  
 Green = Fully functional  
 Yellow = Functional, replacement recommended  
 Red = Disconnected, replacement required

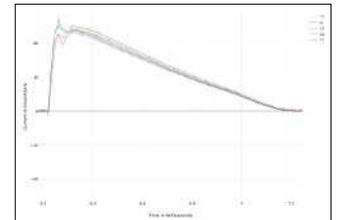
Display of important characteristics

Graphical representation of the surge currents



Analysis of detected electromagnetic interference

Download measured data as a CSV file

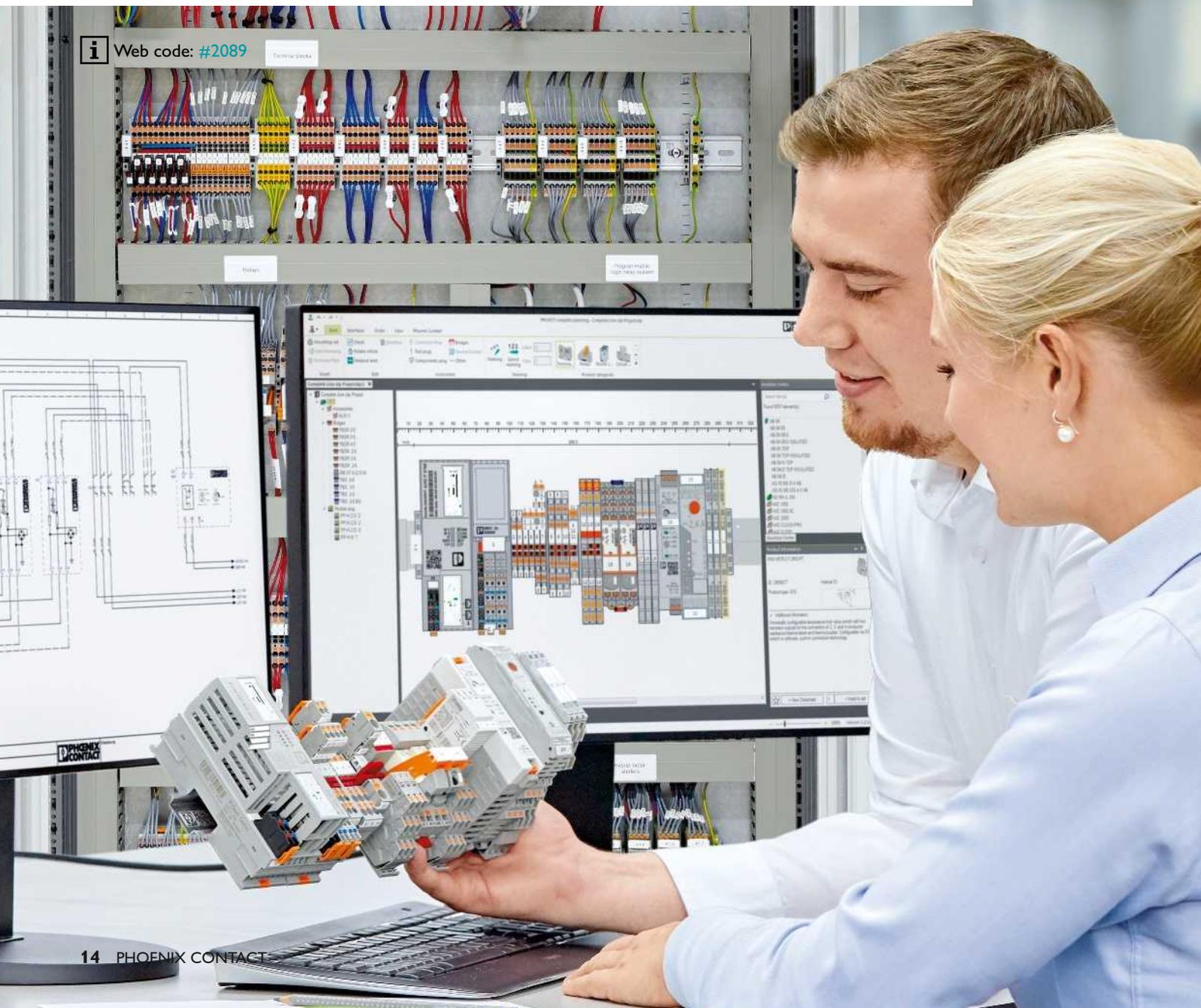


## Ordering information

			
Description	Evaluation and communication unit	1.5 and 3 meter sensor cable	
Type	IPCH-4X-PCL-TCP-24DC-UT	IPCH-SC-1.5	IPCH-SC-3.0
Order No.	1045379	1045380	1069191
Operating voltage	24 V DC	-	
Sampling rate	500 kHz	-	
Detectable values (current strength)	100 A ... 40 kA	-	
Maximum measuring period	1 s	-	

# COMPLETE line – The comprehensive solution for the control cabinet

COMPLETE line is a system comprising technologically leading and coordinated hardware and software products, consulting services, and system solutions that help you optimize your processes in control cabinet manufacturing. Engineering, purchasing, installation, and operation become significantly easier for you.



## Your advantages in detail:



### Comprehensive product portfolio

With COMPLETE line, we offer a complete product portfolio of technologically leading products. This includes:

- Controllers and I/O modules
- Power supplies and device circuit breakers
- Terminal blocks and distribution blocks
- Relay modules and motor starters
- Signal conditioners
- Safety technology
- Surge protection
- Heavy-duty connectors



### Intuitive handling

Thanks to the simple, intuitive handling of the coordinated hardware components, you will save time during installation, startup, and maintenance. Push-in connection technology enables you to wire applications quickly – without using tools. The broad, technologically leading product portfolio will always provide you with the right product for standard or special applications.



### Time savings across the entire engineering process

The PROJECT complete planning and marking software supports the entire process of control cabinet manufacturing. The program features an intuitive user interface that enables the individual planning, automatic checking, and direct ordering of terminal strips.



### Reduced logistics costs

Reduced variety of parts, thanks to standardized marking, bridging, and testing accessories. The COMPLETE line system coordinates products, design, and accessories so that you benefit from maximum reusability and thus reduce your logistics costs.



### Optimized processes in control cabinet manufacturing

COMPLETE line supports you, from engineering through to manufacturing, in designing your control cabinet production as efficient as possible. Thus, your customized concept for optimizing your processes in control cabinet manufacturing is created. Our terminal strip production helps you to flexibly manage order peaks or to supply your control cabinet production with fully assembled DIN rails just in time.



### The new standard for the control cabinet

Discover the extensive COMPLETE line product portfolio and find out more about COMPLETE line and your comprehensive solutions for the control cabinet.

Visit our website:  
[phoenixcontact.com/completeline](https://phoenixcontact.com/completeline)

## In dialog with customers and partners worldwide

Phoenix Contact is a globally present, Germany-based market leader. Our group is synonym for future-oriented components, systems, and solutions in the fields of electrical engineering, electronics, and automation. A global network across more than 100 countries, and 17,400 employees ensure a close proximity to our customers, which we believe is particularly important.

The wide variety of our innovative products makes it easy for our customers to find future-oriented solutions for different applications and industries. We especially focus on the fields of energy, infrastructure, process and factory automation.



You will find our complete product range at:  
[phoenixcontact.com](http://phoenixcontact.com)

PHOENIX CONTACT GmbH & Co. KG  
Flachmarktstraße 8  
32825 Blomberg, Germany  
Phone: +49 52 35 3-00  
Fax: +49 52 35 3-4 12 00  
E-mail: [info@phoenixcontact.com](mailto:info@phoenixcontact.com)  
[phoenixcontact.com](http://phoenixcontact.com)