

# Technology Overview 2018



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## PRODUCT RANGE

Phoenix Contact offers an innovative portfolio of industrial electro-technology. The best connections “from sensor to the controller”.

From the classic terminal block to splashproof machine connectors and wireless ethernet, Phoenix Contact provides innovations that do more than our customers expect.

- Cables and wires
- Connectors
- Controllers
- Electronics housing
- Electronic switchgear and motor control
- Fieldbus components and systems
- Functional Safety
- HMIs and industrial PCs
- I/O Systems
- Industrial communication technology
- Industrial Ethernet
- Installation and mounting material
- Lighting and signaling
- Marking and labeling
- Measurement and control technology
- Modular terminal blocks
- Monitoring
- PCB terminal blocks and PCB connectors
- Power supply units and UPS
- Protective devices
- Relay modular
- Sensor/actuator cabling
- Software
- Surge protection and interference filters
- System cabling for controllers
- Tools
- Wireless data communication

## COMPANY OVERVIEW

Phoenix Contact is a leading developer and manufacturer of electrical connection, electronic interface and industrial automation technologies. Founded more than 80 years ago in Germany, our diverse product range includes components and system solutions for industrial and device connection, automation, electronic interface, and surge protection.

Phoenix Contact is a global company with more than 12,300 employees worldwide. There are more than 40 subsidiaries and sales representatives in another 30 nations. Around the world, our focus on innovation and trusting partnerships with customers creates solutions that benefit all involved.

Our customers operate in a diverse range of industries, from Electrical & Industrial Manufacturing, Solar and Clean energy, Automation & Process Control, to Energy, Water, Mining, and Petrochemical industries. These technical environments require a high degree of expertise and face to face support. With nine locations across Australia and New Zealand, Phoenix Contact has been providing our customers with inspiring innovations and local support since 1995.

**“Satisfaction isn’t enough. We want to inspire.”** *Klaus Eisert*



# THE GLOBAL NETWORK

So that we can work as closely with our customers as possible, we have also established Regional Centers of Competence in Asia and the Americas. It's here that tailor-made solutions are created.

## **Our development sites**

Germany, USA, China, India

## **Our production sites**

Germany, USA, China, India, Brazil, Argentina, Poland, Greece, Turkey, Sweden

## **Our sales subsidiaries**

Argentina, Australia, Austria, Belarus, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Kazakhstan, Lithuania, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Norway, Philippines, Poland, Portugal, Romania, Russia, Singapore, Slovakia, Spain, South Africa, South Korea, Sweden, Switzerland, Taiwan, Thailand, Turkey, Ukraine, United Arab Emirates, United Kingdom, USA, Vietnam

Representatives in more than 30 other countries worldwide.

**GERMANY - Blomberg**



**GERMANY - Bad Pyrmont**



**USA - Harrisburg**



**CHINA - Nanjing**





**“With 60,000 products, together we can find your solution.”**

Electronics housing, electronic switching devices and motor control, fieldbus components and systems, functional safety, HMIs and industrial PCs, I/O systems, Industrial Ethernet, lighting and signaling, industrial communication technology, installation and mounting material, cables and wires, PCB terminal blocks and PCB connectors, marking and labeling, measurement and control technology, monitoring, modular terminal blocks, relay modules, protective devices, sensor/actuator cabling, software, connectors, controllers, power supply units and UPS, system cabling for controllers, surge protection and interference filters, tools, wireless data communication



**“At Phoenix Contact,  
everything revolves around  
future-oriented solutions.”**

## **INDUSTRY SOLUTIONS**

Each sector of industry places particular demands on machine and system automation. In our dedicated Industry Teams, we work together with our industry partners and focus on these challenges. This is how we design tailor-made turn-key solutions based on innovative products and intelligent engineering services. In this way, with the knowledge and enthusiasm of our employees, we find the best possible solution for many sectors of industry.

1300 786 411





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# Terminal Blocks

2017/2018



## 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



### Automation

- Lighting and signaling
- Fieldbus components and systems
- Functional safety
- HMIs and industrial PCs
- I/O systems
- Industrial cloud computing
- Industrial communication technology
- Software
- Controllers



### PCB terminal blocks and PCB connectors

To quickly select a product, use our e-Paper.

**i** Webcode: #1517

## Find out more with the web code

On some of the catalog pages, you can find our webcode: a hash symbol followed by a four-digit number combination.

**i** Web code: #1234 (example)

This allows you to access information on our website quickly.

### It could not be easier:

1. Go to the Phoenix Contact website
2. Enter # and the number combination in the search field
3. Get more information and product versions

Or use the direct link:

[phoenixcontact.net/webcode/#1234](https://phoenixcontact.net/webcode/#1234)

You will find the latest information and all new products directly in the product area of our website:

[phoenixcontact.net/products](https://phoenixcontact.net/products)

Also discover the Phoenix Contact catalog app interactively on your tablet.



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# Product range in pictures

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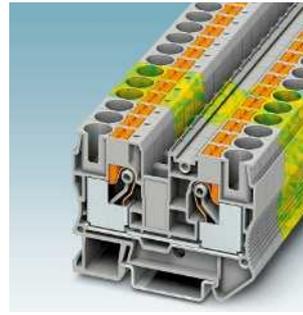
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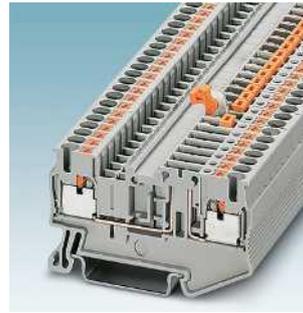
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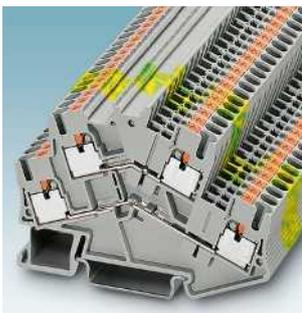
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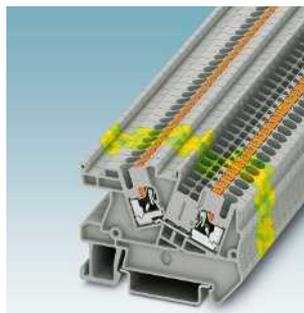
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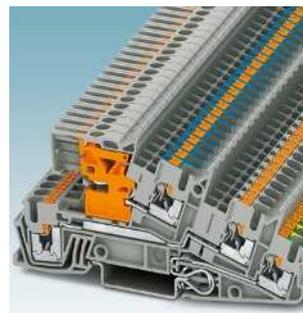
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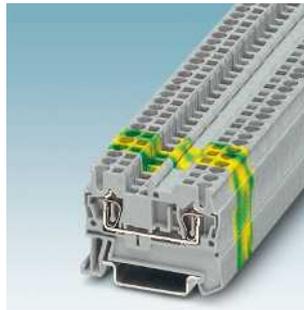


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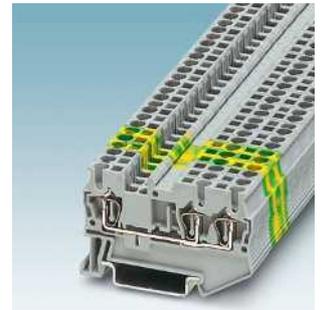
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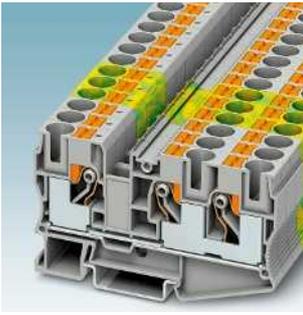


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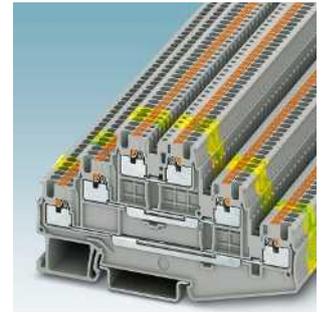
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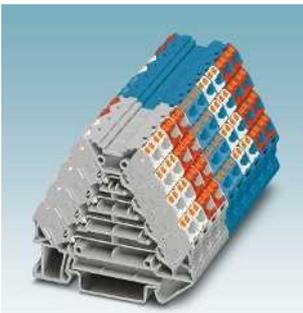
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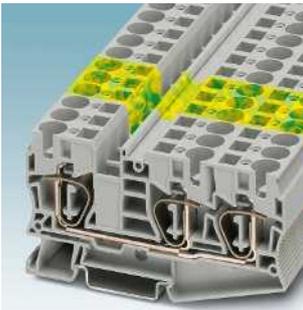


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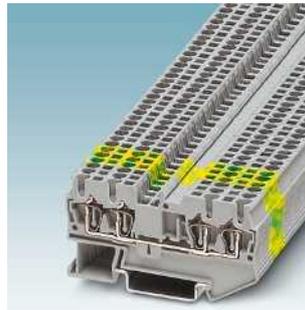
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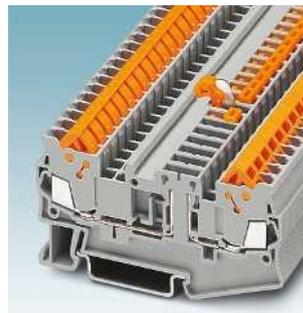
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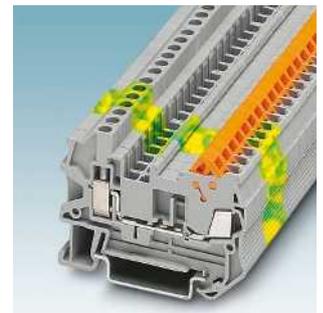
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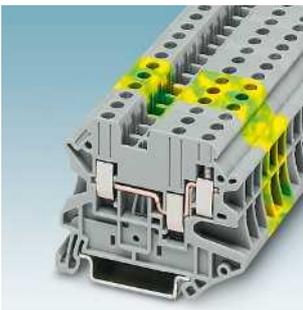
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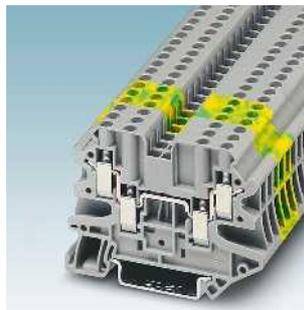
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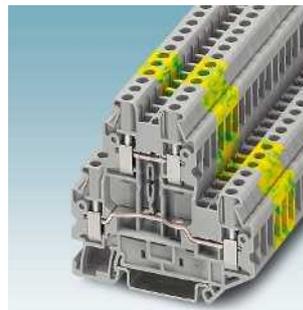
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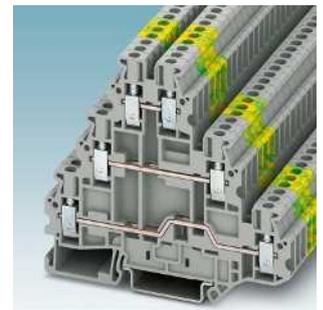
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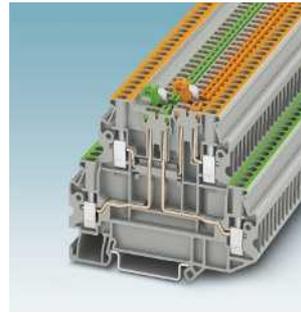
From here, you can access the desired product directly



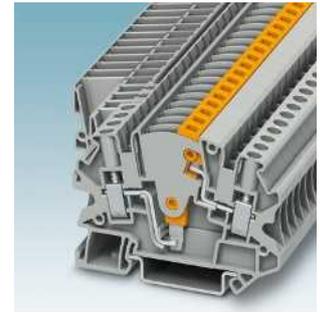
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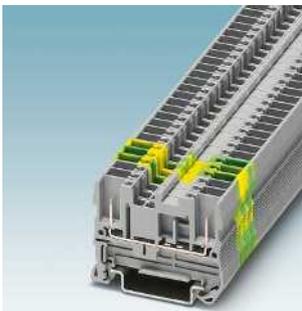
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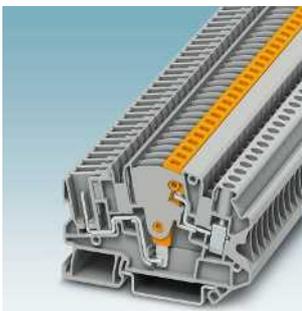
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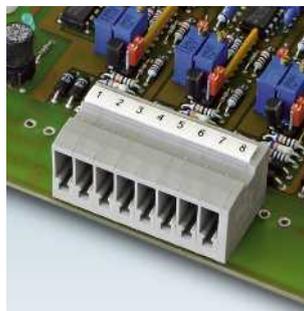
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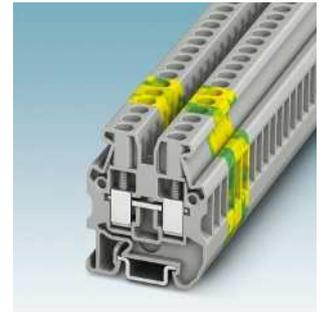
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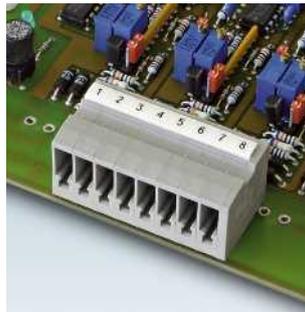
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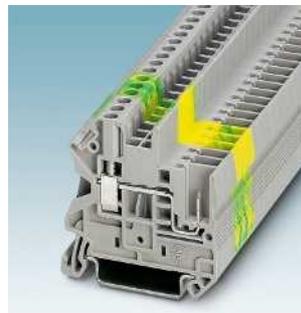
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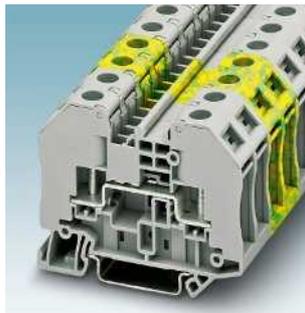
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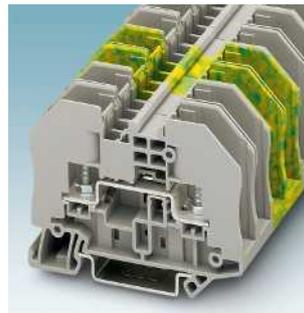
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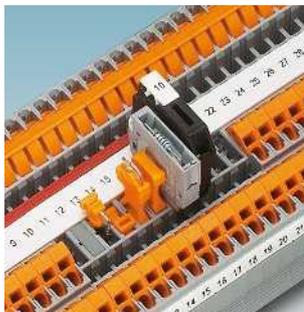
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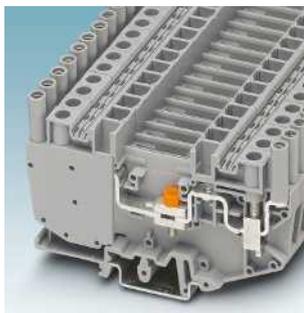
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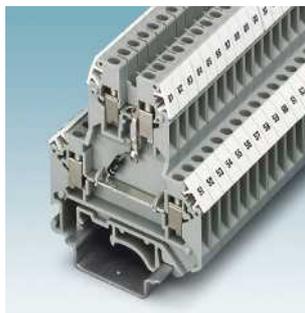
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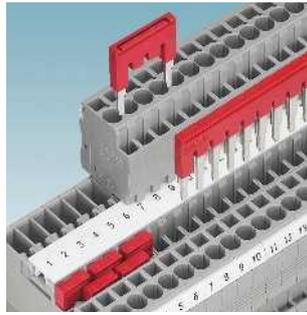


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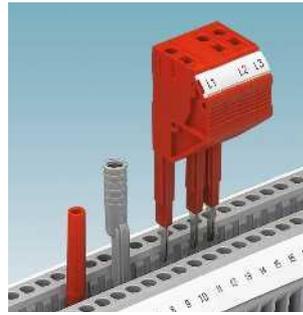
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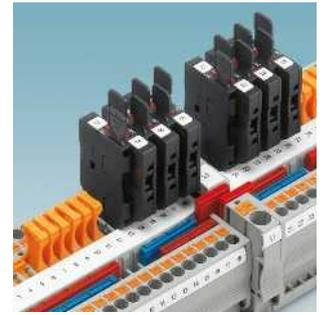
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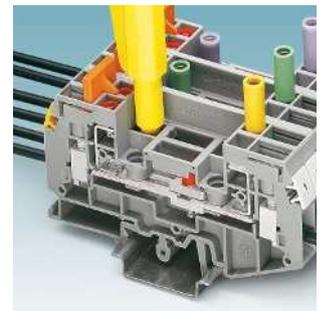
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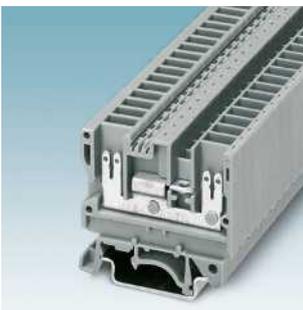
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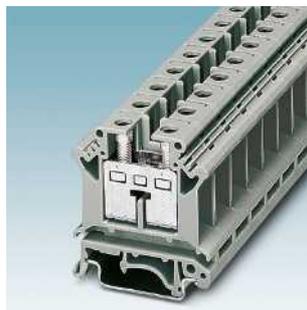
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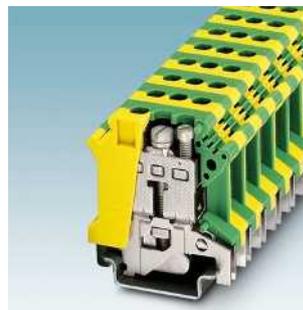
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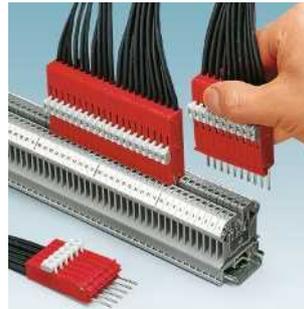
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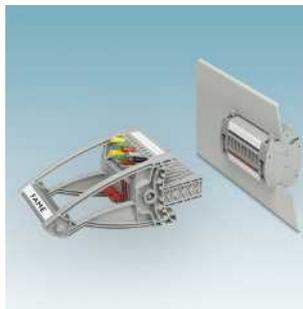


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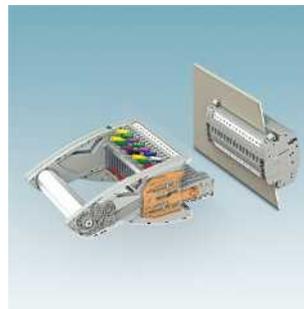
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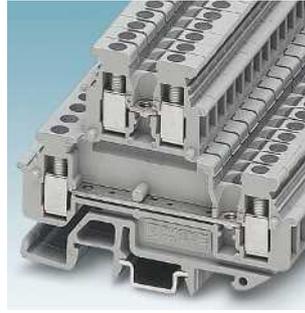
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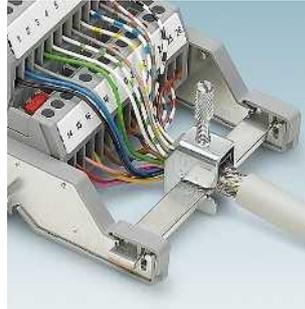
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2

# Sensor/Actuator Cabling and Connectors

2017/2018



## Sensor/actuator cabling and connectors



### Terminal blocks

- Terminal blocks



### Interface technology and switching devices

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



### Marking systems, tools and mounting material

- Marking and labeling
- Tools
- Installation and mounting material



### Automation

- Lighting and signaling
- Fieldbus components and systems
- Functional safety
- HMIs and industrial PCs
- I/O systems
- Industrial cloud computing
- Industrial communication technology
- Software
- Controllers



### Power supplies, surge protection and device circuit breakers

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



### PCB terminal blocks and PCB connectors

To quickly select a product, use our e-Paper.

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## Find out more with the web code

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Also discover the Phoenix Contact catalog app interactively on your tablet.



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We will always have the right connection technology for your application

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### Screw connection

The screw connection is the most universal and globally accepted conductor connection technology. An important characteristic is the maintenance-free conductor contact. It is not necessary to retighten the connection screw.

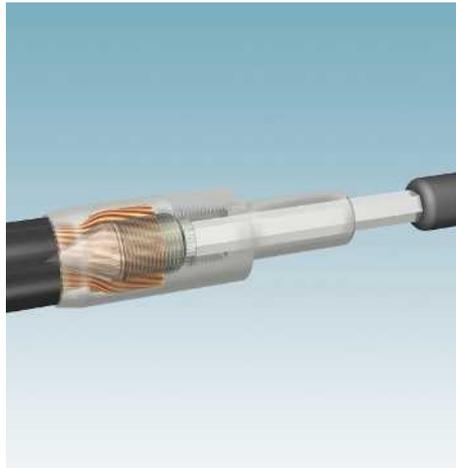
All kinds of copper wires can be clamped without any pretreatment, thereby making gas-tight and permanent contact.

The wire protection, which protects the individual litz wires from damage, is located between the screw and the conductor. The wire protection also performs a screw locking function to prevent release due to vibrations and temperature fluctuations.

Splicing protection can be implemented in the form of ferrules.

With a screw connection, several conductors may also be clamped under one screw.

The conductive parts of the screw connections are made from high-grade copper alloys that are resistant to stress cracking and corrosion.



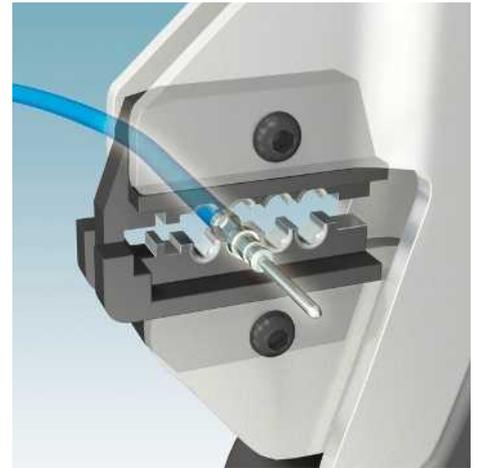
### Axial screw connection

With this method, the wire end to be contacted is guided into the connection area of the pin or socket contact.

A tapered mandrel (part of the contact) is then screwed into the stranded wire from the front. Radial pressure is applied to the strands of the wire, pressing them against the contact wall. This results in a gas-tight connection with long-term stability between the wire and contact. It is important that the specified tightening torque is observed.

The mandrel is pressed in using an Allen key which is applied to the front of the contact. This connection technology combines the advantages of screw and crimp connection.

The axial screw connection requires very little space, is easy to use, and only requires a standard Allen key.



### Crimp connection

The crimp connection impresses with its small space requirements and its cost-effective creation in series production. For a reliable connection, it is essential that the wire cross section, the crimp contact, and the crimping tool are compatible. Since the crimping tools are subject to a certain degree of wear, the crimping process must be monitored during large-scale production.

Crimp connections can be established with the aid of crimping pliers or crimping machines through specific deformation of the crimping area of the contact.

The requirements for crimp connections are defined in DIN EN 60352-2. Proof of the quality of a crimp connection can be seen in the tensile strength of the connection and crack-free deformation of the crimp contact. Crimping must not result in impermissible elongation of crimp contacts, as this would prevent them from latching correctly in the contact carrier.

The contact is released using an unlocking tool. Assembly tools are also available for very thin conductors.



### Push-in connection for contact inserts

Stranded conductors with ferrules or solid conductors can be quickly and easily inserted directly into the connection without tools. The contact spring is formed in such a way that it opens automatically when the conductor is pushed in. It thereby provides the required pressure force against the current bar for a gas-tight, vibration-proof, and shock-proof connection.

To release conductors or connect smaller cross sections, the spring is opened by means of the orange push button – this is done easily and without direct contact with live parts.

The conductive metals are made from high-grade copper alloys. All metal parts of the connection are made from corrosion-resistant materials.



### Push-Lock connection for circular connectors

Stranded conductors without ferrules can be easily connected using the lever. The terminal point is completely opened by the color lever and remains in this open position. Even small cross sections are easy to insert. The lever must be closed for the connection.

Wire solid conductors and conductors with ferrules easily and without using tools by means of direct insertion. The contact point does not have to be opened first.

To release a connected conductor, the lever is opened. The conductors can be removed with ease.

All metal parts of the connection are made from corrosion-resistant materials.



### IDC displacement connection

The QUICKON connection is equipped with an IDC insulation displacement contact. The term "IDC" stands for Insulation Displacement Connection. With this connection method, an unprepared wire with insulation is positioned in front of the gap of the insulation displacement contact and then pushed into the blade gap through insulation displacement. In so doing, the wire insulation is severed and gas-tight contact is made between the wire and the contact. This reduces connection time by at least 60%.

The connection force is independent of the user and completely reliable provided the permissible conductor cross sections and connection conditions are observed. Solid and stranded conductors can be rewired up to 10 times. However, the wire end should be cut off before connecting again.

QUICKON connections have proven themselves in numerous applications for Phoenix Contact over recent years, such as connectors, for COMBICON, and terminal blocks to CEE plug-in equipment from 0.14 to 6.0 mm<sup>2</sup>.

# Sensor/actuator cabling and connectors

## Product range overview

### Circular connectors



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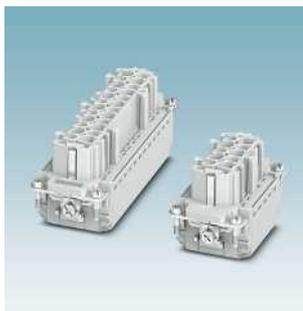
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# Marking Systems, Tools and Mounting Material

2017/2018



## Marking systems, tools and mounting material



### Terminal blocks

- Terminal blocks



### Interface technology and switching devices

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



### Sensor/actuator cabling and connectors

- Sensor/actuator cabling
- Cables and lines
- Connectors



### Automation

- Lighting and signaling
- Fieldbus components and systems
- Functional safety
- HMIs and industrial PCs
- I/O systems
- Industrial cloud computing
- Industrial communication technology
- Software
- Controllers



### Power supplies, surge protection and device circuit breakers

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



### PCB terminal blocks and PCB connectors

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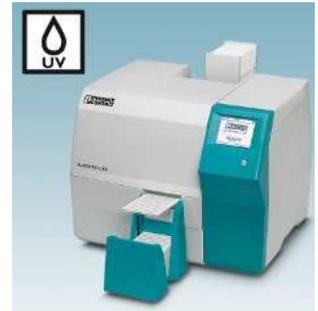
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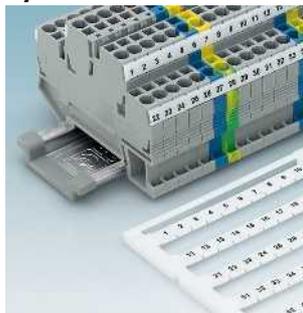


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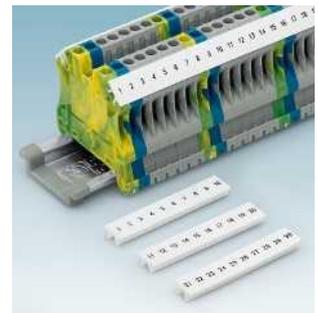
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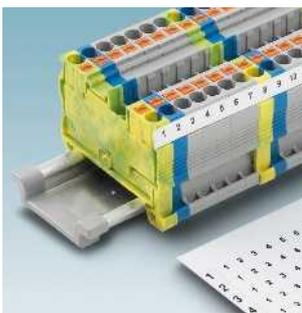
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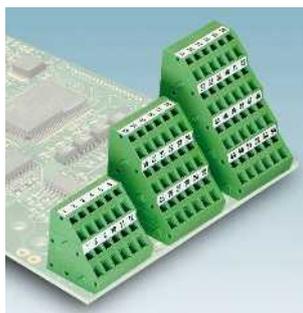
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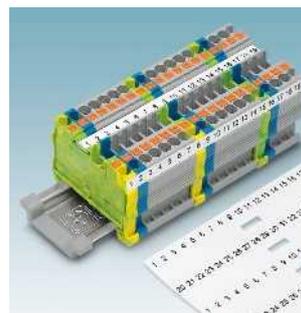
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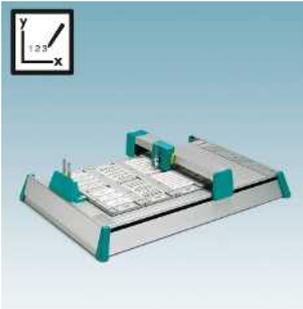
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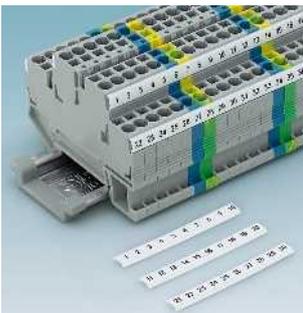
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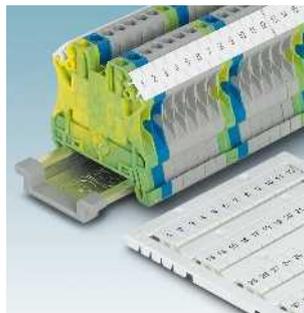
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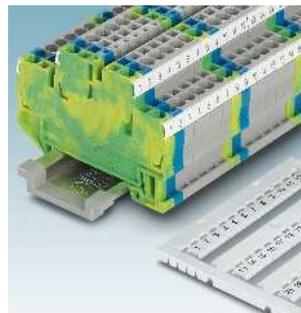
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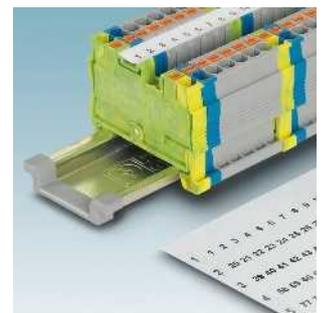
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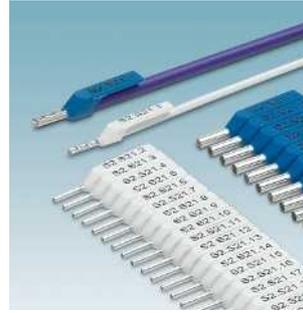
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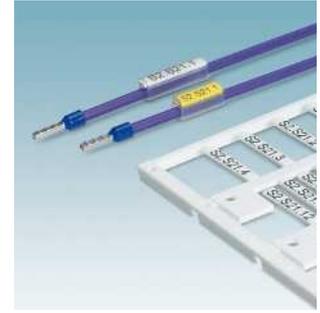
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# Marking systems, tools, mounting material

## Product range overview in pictures

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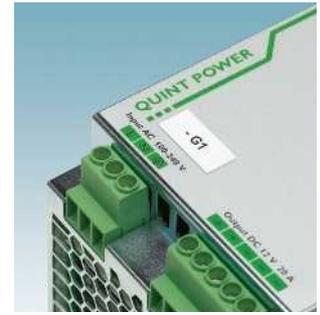
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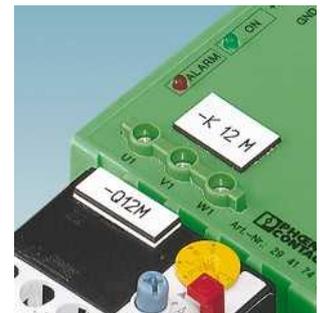
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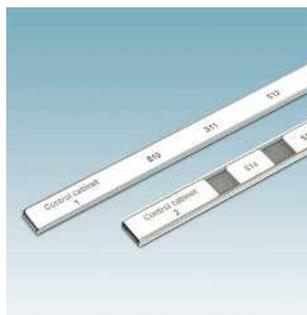
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# Marking systems, tools, mounting material

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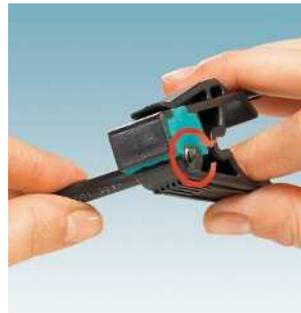
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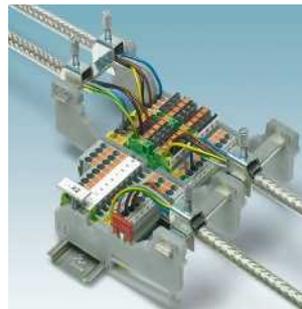
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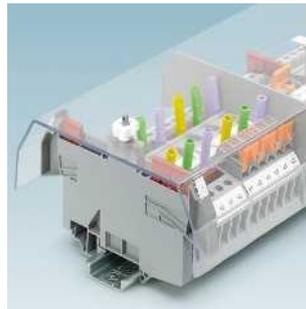
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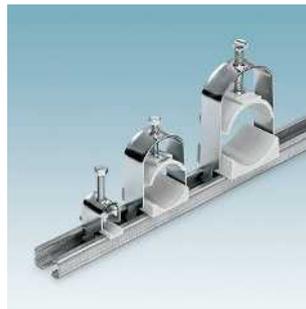
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# Power Supplies, Surge Protection and Device Circuit Breakers

2017/2018



# Power supplies, surge protection and device circuit breakers



## Terminal blocks

- Terminal blocks



## Interface technology and switching devices

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



## Sensor/actuator cabling and connectors

- Sensor/actuator cabling
- Cables and lines
- Connectors



## Automation

- Lighting and signaling
- Fieldbus components and systems
- Functional safety
- HMIs and industrial PCs
- I/O systems
- Industrial cloud computing
- Industrial communication technology
- Software
- Controllers



## Marking systems, tools and mounting material

- Marking and labeling
- Tools
- Installation and mounting material



## PCB terminal blocks and PCB connectors

To quickly select a product, use our e-Paper.

**i** Web code: #1517

## Find out more with the web code

On some of the catalog pages, you can find our webcode: a hash symbol followed by a four-digit number combination.

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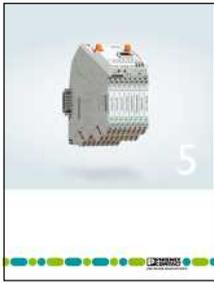
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# Interface Technology and Switching Devices

2017/2018



# Interface technology and switching devices



## Terminal blocks

- Terminal blocks



## Power supplies, surge protection and device circuit breakers

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



## Sensor/actuator cabling and connectors

- Sensor/actuator cabling
- Cables and lines
- Connectors



## Automation

- Lighting and signaling
- Fieldbus components and systems
- Functional safety
- HMIs and industrial PCs
- I/O systems
- Industrial cloud computing
- Industrial communication technology
- Software
- Controllers



## Marking systems, tools and mounting material

- Marking and labeling
- Tools
- Installation and mounting material



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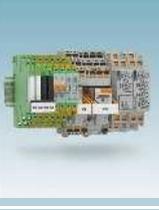
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# HMIs and industrial PCs

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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# HMI and industrial PCs

## Product overview

### HMI for HTML5 applications



Web panels with open browser  
Page 14

### HMI for WebVisit software



Minitouch  
Page 16



Web panel  
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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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Valueline panel PCs  
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Panel PCs with IP65  
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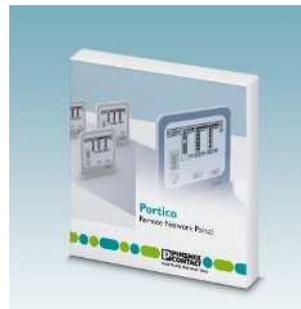
### Software



WebVisit – development software for web-based visualizations  
Page 59



Visu+ – SCADA visualization, development and runtime licenses  
Page 60



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

Page 28



Rackmount PC – 2U

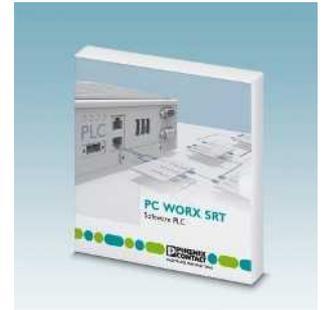
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**Software PLC**



PC WORX RT BASIC – software PLC with realtime extension

Page 29



PC WORX SRT – software PLC without realtime extension

Page 29

**Tablet PCs**



Tablet PCs

Page 40

**Monitors with touch function**



Monitors with touch function

Page 43

**HMIs and IPCs for outdoor applications**



Web panels and panel PCs

Page 44

**HMIs and IPCs for maritime applications**



Touch panels and panel PCs

Page 48

# 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.

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# Software

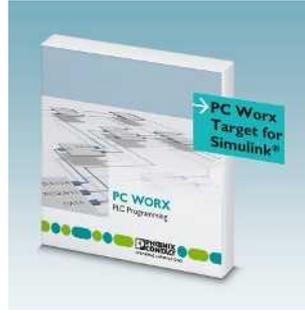
## Product overview

### 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



SafetyProg – programming software for PROFI-safe controllers

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 Your web code: #1104



Functional and industry-specific software and drivers

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### Visualization



WebVisit – development software for web-based visualizations

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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 Axoline F I/O stations



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

Page 440



SAFECONF – configuration software for TRISAFE and SafetyBridge modules

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

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 Your web code: #1164

**Configuration, monitoring, and diagnostics**



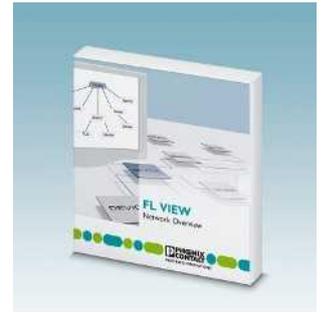
Config+ – tool for INTERBUS configuration and diagnostics  
Page 62



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  
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**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

**i** Your web code: #1161

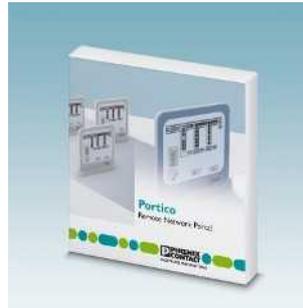
**Marking**



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

**i** Your web code: #1093

**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

**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

# Controllers

## Product overview

### Programmable logic relay system



Programmable logic relay system  
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### Modular controllers in Axio format



Class 1000 small-scale controllers  
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Class 3000 high-performance controllers  
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Controller for the power industry  
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### Modular controllers in Inline format



Controller for building infrastructure  
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Class 100 small-scale controllers  
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Class 100 small-scale controllers for machine building  
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Class 100 small-scale controllers for remote communication  
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### Compact controllers



Class 300 controllers  
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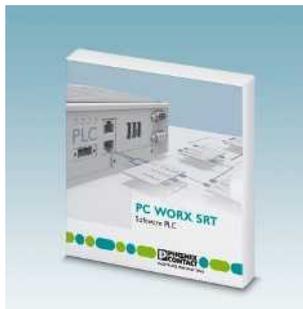


Class 400 compact controllers  
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### Software PLC



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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### Starter kits



Starter kit for automation with small-scale controllers – PROFINET  
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Starter kit for automation with small-scale controllers – INTERBUS  
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Software for control technology



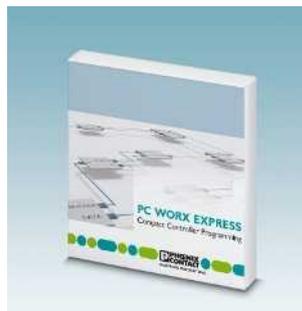
Functional and industry-specific software and drivers

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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

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WebVisit – development software for web-based visualizations

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Services for automation



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

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Training – individual training concepts, training courses

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Engineering – configuration, programming, visualization, coaching

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I/O systems



I/O systems for the control cabinet (IP20)

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I/O systems for field installation (IP67)

Page 190

System cabling



• See Catalog 5 – system cabling for controllers

**i** Your web code: #0702

AC charging controllers



• See Catalog 2 – Charging technology for E-Mobility

**i** Your web code: #0501

# 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.

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### For the control cabinet (IP20)

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#### Axioline F

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#### Inline Block IO

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#### INTERBUS Smart Terminals

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#### Axioline E

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# I/O systems

## Product overview

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Inline Block IO Page 188



INTERBUS ST Page 189

### I/O systems for field installation (IP67)



Axioline E – devices in plastic and metal version Page 190



Fieldline Modular Page 208



Fieldline Stand-Alone Page 236



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

# 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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# Functional Safety

## Product overview

### Safety relay modules for machine building – safety relays



**PSRmini** – highly compact safety relays for all common applications  
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**PSRclassic** – safety relays for all common applications, with time function, extension modules  
Page 260



**PSRmodular** – modular safety relay system with DIN rail connector  
Page 264



**PSRmultifunction** – safety relay for three safety functions in a single device  
Page 266

### Zero-speed and over-speed safety relays



**PSRmotion** – zero-speed and over-speed safety relays that can be parameterized via software  
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**PSRmotion** – sensor-free downtime monitoring of 1- and 3-phase alternating current and direct current motors  
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**PSRclassic** – coupling relays  
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### Safety relay modules for the process industry – safe coupling relays



**PSRmini** – highly compact, safe coupling relays for failsafe controllers and F&G applications  
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**PSRclassic** – safe coupling relays for failsafe controllers  
Page 286



**PSRclassic** – Termination Carriers for the alignment and easy mounting of coupling relays  
Page 289



**PSRmini** – Termination Carriers for the alignment and easy mounting of highly compact coupling relays  
Further information:  
[phoenixcontact.net/products](http://phoenixcontact.net/products)

### Configurable safety modules



**TRISAFE-S** – master module, cannot be extended  
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**TRISAFE-M** – master module that can be safely extended  
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**TRISAFE** – extension modules  
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### Safe I/Os



Logic modules for safe signal exchange using a SafetyBridge system

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Safe I/O modules for safe signal exchange in popular networks

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Safe I/O modules – output module with relay outputs, Inline ECO safety module with two sensor circuits

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Safe I/O modules for safe signal exchange in popular networks

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### Safe control technology



Safe PROFINET gateway

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Safe PROFIsafe controller

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Control solution for functional safety

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### Safe signal conditioners



• See Catalog 5 – Interface technology and switching devices

Your web code: #1135

### Software



SAFECONF – configuration software for TRISAFE and SafetyBridge modules

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

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SafetyProg – programming software for PROFIsafe controllers

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Safety AI – function blocks for safe analog value processing

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### Services for functional safety



Consultation and presentation  
Individual consultation and on-site process assistance

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Engineering and product support  
Free 24-hour safety hotline, on-site service, workshops, concept support

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Seminars and workshops  
Theoretical and practical know-how for machine safety

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Safety in the process industry  
Safe design of protective functions in the process industry

Page 312

# 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



FO converters for RS-232

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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

Page 432

### Remote communication



Alarm generation – remote signaling and remote control system

Page 348



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

Page 449



Bluetooth wireless modules (2.4 GHz) Wireless multiplexer with antennas

Page 466

Fiber optics transmission



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FO converters for DeviceNet™ and  
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FO converters for  
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Serial device servers, 1 port,  
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Serial device servers and protocol  
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Passive mini patch panels with various  
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Remote control and remote maintenance –  
DSL broadband router/modem with firewall,  
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Remote control –  
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Remote control –  
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Fast connection technology



Type A Fast Connect PROFIBUS cable  
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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

# 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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## Product overview

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Standard Switches with basic function  
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### Hubs



Ethernet hubs with 8/16 RJ45 ports  
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### Power over Ethernet



Power over Ethernet switches  
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### Managed Switches



Managed Switches, up to 8 ports (RJ45/FO)  
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Managed Switches feature flexible, scalable performance  
Page 408



Smart Managed Compact Switches with up to 16 ports (RJ45/FO)  
Page 414



PROFINET Realtime Switch (RJ45/SC-RJ)  
Page 416

### Managed Switches



Switches for high-availability EtherNet/IP™ networks  
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Gigabit Modular Switches with up to 28 ports (RJ45/FO)  
Page 421

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Plug-in I/O module and replaceable configuration connector  
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Serial device servers



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ISOLATOR



Isolator for electrical isolation Page 344

Patch panels



Passive mini patch panels with various connection options Page 346

# 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

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# Wireless data communication

## Product overview

### Wireless Ethernet



Industrial WLAN – WLAN access point and Ethernet adapter  
Page 452



Industrial WLAN – WLAN access point  
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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  
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### 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  
Page 463

### Wireless I/O



Bluetooth wireless modules (2.4 GHz) Wireless multiplexer with antennas  
Page 466

### WirelessHART



WirelessHART gateway  
Page 464



WirelessHART adapter  
Page 465

**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  
Page 469

**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  
Page 348



Remote maintenance – mGUARD security router  
Page 350



Remote control – mobile router  
Page 364

**Antennas and cables**



Antennas  
Page 472



Adapters, extension cables  
Page 480

# 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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Class 400 LED enclosure lights	<b>485</b>
Class 600 LED enclosure lights	<b>486</b>
<b>Machine lights</b>	
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Class 200 LED machine lights	<b>490</b>
<b>Tower lighting</b>	
LED tower lighting	<b>494</b>
<b>Signal lights</b>	
LED signal lights	<b>497</b>
<b>Signal towers</b>	
Optical signal elements	<b>499</b>
Audible signal elements	<b>502</b>
Connection and mounting elements	<b>504</b>

## Product overview

### Enclosure lights



Class 400 LED enclosure lights  
Page 485



Plug-in power supply for class 400 LED enclosure lights  
Page 485



Class 600 LED enclosure lights  
- With motion detector  
Page 486



Class 600 LED enclosure lights  
- With motion detector and socket  
Page 487

### Machine lights



Class 100 LED machine lights  
Width 23 mm, degree of protection IP67  
Page 488



Class 200 LED machine lights  
Ø 40 mm, degree of protection IP67  
Page 490



Class 200 LED machine lights  
Ø 70 mm, degree of protection IP67  
Page 492



Class 200 LED machine lights  
Length 284 mm, degree of protection IP69  
Page 491

### Tower lights



LED tower lighting  
Page 494

### Signal lights



LED signal lights  
Page 497

### Signal towers



Optical signal elements  
Page 499



Audible signal elements  
Page 502



Voice output element  
Page 503



Connection and mounting elements  
- For surface and tube mounting  
Page 504

# 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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<b>Process fieldbus</b>	
Field connection boxes	<b>511</b>
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<hr/>	
<b>Inline Ex i</b>	
Intrinsically safe I/Os for the Ex area	<b>168</b>

# Process infrastructure

## Product overview

### Process fieldbus



Field connection boxes in stainless steel  
Page 511



Device couplers for the field  
Page 512



Fieldbus barrier installed in Zone 1  
Page 514



Device couplers for Fieldbus  
installed in Zone 2  
Page 514



Power supply  
Connector for the power supply  
Page 517



Power supply  
Base for the power supply  
Page 517



Power supply  
Base for redundant four-channel  
fieldbus power supply  
Page 517



Field diagnostic modules  
FOUNDATION Fieldbus diagnostic module  
Page 518

### Surge protection



Surge protection for fieldbus systems  
Page 519

### Modbus protocol converters



Modbus gateways for PROFIBUS DP/PA  
and FOUNDATION Fieldbus  
Page 520

### Wired HART



Ethernet HART multiplexer  
Page 521

**Inline Ex i – intrinsically safe I/Os for the ex area**



Intrinsically safe power supply terminal  
Page 168



Intrinsically safe digital I/O terminals  
Page 169



Intrinsically safe analog I/O terminals  
Page 169



Intrinsically safe temperature input terminal  
Page 169

**Wireless data communication**



WirelessHART gateway  
Page 464



WirelessHART adapter  
Page 465



Radioline wireless modules  
Page 457

**Surge protection for MCR technology**



• See Catalog 4 –  
PLUGTRAB PT-IQ –  
Surge protection for Ex i circuits

**i** Your web code: #0292



• See Catalog 4 –  
TERMITRAB complete –  
terminal blocks (intrinsically safe) with multi-  
stage surge protection

**i** Your web code: #0292



• See Catalog 4 –  
SURGETRAB – field devices directly at the  
sensor head (intrinsically safe)

**i** Your web code: #0292

**Measurement and control technology**



• See Catalog 5 –  
Ex i signal conditioners with functional safety

**i** Your web code: #0293



• See Catalog 5 –  
Ex i 2-wire field devices

**i** Your web code: #0294



**“With 60,000 products, together we can find your solution.”**

Electronics housing, electronic switching devices and motor control, fieldbus components and systems, functional safety, HMIs and industrial PCs, I/O systems, Industrial Ethernet, lighting and signaling, industrial communication technology, installation and mounting material, cables and wires, PCB terminal blocks and PCB connectors, marking and labeling, measurement and control technology, monitoring, modular terminal blocks, relay modules, protective devices, sensor/actuator cabling, software, connectors, controllers, power supply units and UPS, system cabling for controllers, surge protection and interference filters, tools, wireless data communication