Signal conditioners, process indicators, and field devices
Transmit and visualize signals without interference
Transmit and visualize signals without interference

In electrotechnical systems, electromagnetic or high-frequency disturbance variables can adversely affect the transmission of often sensitive measured value signals. Our signal conditioners, process indicators, and field devices ensure interference-free signal transmission from the sensor level to the control level.

Highly compact signal conditioners
MIINI Analog Pro offers the easiest installation and startup in a confined space. With the plug-in gateways, you can combine the advantages of safe electrical isolation with those of digital communication. Transmit up to eight field signals to industrial networks without any interference. This eliminates the need for signal-specific input cards.

Field devices
Field devices enable you to record the signals from resistance temperature detectors, thermocouples, resistance-type sensors, and voltage sensors directly in the field and convert them into standard signals. The products are available for control cabinet installation or installation in the field.

Find out more with the web code
For detailed information, use the web codes provided in this brochure. Simply enter # and the four-digit number in the search field on our website.

Web code: #0960
Web code: #1234 (example)
Or use the direct link:
phoenixcontact.net/webcode/#1234
Signal conditioners with functional safety and explosion protection

MACX Analog signal conditioners provide you with comprehensive solutions for safe, interference-free analog and digital signal processing. In addition to explosion protection for all zones and material groups, MACX Analog provides functional safety in accordance with SIL IEC/EN 61508 and PL EN ISO 13849.

The new standard for the control cabinet. More information is available on pages 54 to 55.

Process indicators

The Field Analog process indicators enable you to monitor and display analog and temperature signals, and to control them via digital and analog inputs and outputs.
Highly compact signal conditioners with plug-in connection technology

Easier than ever but slim as before: MINI Analog Pro is the first 6 mm signal conditioner range with plug-in connection technology. Easily accessible terminal points and current signal measurement during operation make your work easier than ever.

Your advantages

- Easy installation, thanks to easily accessible terminal points and plug-in connection terminal blocks
- Measure current signals during operation, without disconnecting current loops
- Versatile configuration via DIP switch, software, or app
- Service-friendly, thanks to large-surface marking areas and status LEDs
- Rapid power bridging and group error messaging with the DIN rail connector

Service-friendly

Large-surface marking areas enable complete loop identification using standard marking material. All status and error indicators are always visible and provide you with an instant overview on site.
Smart configuration and monitoring

Depending on the product type, you can access the devices wirelessly: via NFC and Bluetooth. Benefit from the comprehensive functions of the MINI Analog Pro app and configure the modules directly on site, or read the current measured values during operation.
Signal conditioners with bus and network connection

Safely isolated from the field through to the network: the plug-in MINI Analog Pro gateways combine the advantages of safe electrical isolation with those of digital communication. With an overall width of less than 50 mm, you can transmit up to eight field signals in industrial networks without any interference, while also eliminating the need for signal-specific input cards.

Your advantages

✅ Easy network integration of signal conditioners in any combination by means of compact gateways
✅ Interference-free signal transmission right through to the CPU, thanks to safe electrical isolation
✅ Cost and space savings, as signal-specific input cards are no longer needed
✅ Fast, error-free signal bundling in one network cable
✅ Convenient configuration and monitoring via the MINI Analog Pro app or via web interface
No need for input cards
Save space and costs: thanks to the direct network connection, you no longer need signal-specific input cards and can benefit from consistent electrical isolation right through to the CPU, including between the individual channels.

Error-free wiring, easy configuration
Bundle eight channels quickly and without errors in just one network cable. Configure module settings easily via a rotary coding switch, software, web interface, or app.
Signal conditioners with functional safety and explosion protection

Reliable and safe: MACX Analog signal conditioners provide you with comprehensive solutions for safe, interference-free analog and digital signal processing. In addition to explosion protection for all zones and material groups, MACX Analog provides functional safety in accordance with IEC/EN 61508 (SIL) and EN ISO 13849 (PL).

Your advantages

- Safe and reliable: international Ex approvals and functional safety in accordance with SIL and PL
- High signal quality, thanks to safe electrical isolation and long service life, thanks to low self-heating
- Overall width of just 12.5 mm for single- and two-channel standard functions
- Easy 24 V power bridging with group error messaging or wide-range input up to 230 V AC/DC
- Service-friendly connection technology: coded, plug-in terminal blocks

Rapid power bridging and group error messaging

In addition to rapid power bridging without wiring, the DIN rail connector also simplifies system extension and module replacement during operation. Group error messaging enables convenient diagnostics.

Web code: #1143
High signal quality and long service life

The transmission concept with safe electrical isolation ensures precise, interference-free signal transmission. Benefit from a long service life and high operational safety over the entire operating temperature range, thanks to low power consumption and self-heating.

Connection terminal blocks with integrated test sockets and polarity reversal protection

Savings of up to 30% with single- and two-channel products (overall width of just 12.5 mm)

Convenient configuration and monitoring

You can very easily configure the devices without software via the DIP switches on the front of the housing, or conveniently from a PC: either using FDT/DTM software, or alternatively the user-friendly stand-alone Windows software with integrated monitoring function.
System cabling solutions for signal conditioners

Fast and error-free signal connection: our Termination Carriers and system adapters are Plug and Play solutions for fast and error-free connection of a large number of signals from the field to your automation system. By using standard DIN rail devices, you only need one engineering design for standard DIN rail and system applications.

Your advantages

✔ Fast, error-free connection of a large number of signals using a consistent system cabling solution
✔ Significant space savings, thanks to compact module carriers that can be aligned directly next to each other
✔ High failsafe performance: stable aluminum profile with passive PCB without active components
✔ Just one engineering design for standard DIN rails and system applications
✔ Easy wiring, thanks to plug-in, coded cable sets and pre-assembled system cables

Web code: #1138

Optimum adaptation
The controller-side connection is established via pre-assembled VARIOFACE system cables with front adapters. A wide range of system connectors and front adapters for I/O cards of various automation systems, e.g., ABB, Emerson, Honeywell, Invensys, Siemens, and Yokogawa, are available for optimum adaptation to your system. Contact us for more information.

Space saving
Thanks to the compact design and deep system connections, space savings of up to 30% can be achieved compared to market-standard solutions.
MINI Analog Pro system adapter

Simply snap on and you're done: the system adapter allows you to connect eight MINI Analog Pro signal conditioners in any combination to your controller.

High availability

The stable, vibration-proof aluminum carrier has a profile for accommodating standard DIN rail devices. The termination PCB is also mechanically decoupled and only has passive components.
Process indicators and field devices

Record, control, and monitor: the Field Analog process indicators enable you to monitor and display analog and temperature signals, and to control them via digital and analog inputs and outputs. Field devices record and convert the signals from resistance temperature detectors, thermocouples, resistance-type sensors, and voltage sensors directly on site.

Web code: # 1140

Record and convert in the field

Field devices enable you to record the signals from resistance temperature detectors, thermocouples, resistance-type sensors, and voltage sensors directly in the field and convert them into standard signals. The products are available for control cabinet installation or installation in the field.

Push-in Technology

Designed by PHOENIX CONTACT

Your advantages

- Easy configuration of process indicators via front keypad or FDT/DTM software
- Everything at a glance: display values as well as bar graphs or measuring point designations, additional color change in the event of an error
- Digital transfer, display, and remote configuration of process data via integrated HART communication
- International use, thanks to UL and CSA approvals
- Also for intrinsically safe circuits in the Ex area: versions with ATEX, CSA, and FM approval
Everything at a glance

Current process values are easy to read on the five-digit backlit displays. The bar graph also provides you with a quick overview. Alarm states can be identified easily from a distance by their changing color.

Universal use

Field Analog process indicators are available for field and control panel installation. The universal inputs allow you to record current, voltage, RTDs, and TCs. Comprehensive approvals also allow you to connect sensors in the Ex area.
Creative solutions for a smart world: Analog meets digital

Phoenix Contact will support you on your journey to a smarter world with a versatile range of innovative products, software, services, and expertise tailored to your applications. Digitalization is the way forward if it creates added value. Find out here how we have already incorporated trends in digitalization into our products.
Your factory calibration certificate
Factory calibration certificates for the preconfigured products you order are available on request. The test data is already determined during the production process and supplied directly with the product. This saves you having to deal with an external test laboratory. The certificates are available with or without test data. Simply select the appropriate option for the factory calibration certificate via the web configurator on our homepage.

Smart information, configuration, and monitoring
These are just a few of the areas where our signal conditioners and measuring transducers provide support as soon as you start working with them. With the MINI Analog Pro app, we present you with a comprehensive tool that allows you to handle these tasks precisely. Furthermore, you can download the full product documentation and test your required configurations in advance.

Quality from a single source – Made by Phoenix Contact
It is only when you keep sight of every little detail that you can be sure the quality is right. This is why we develop and produce everything ourselves for our signal conditioners. We produce high-quality “Made in Germany” signal conditioners at our own plastic, metal, and SMD production facilities. Another advantage for you: short delivery times, even for large quantities.

From the field to the cloud
The plug-in MINI Analog Pro gateways enable you to digitalize the measured values of up to eight signal conditioners in any combination. Set the course for the future today and, for example, connect new and existing systems to the Internet of Things using the Cloud IoT Gateway, without interfering with the automation logic.

Your custom product
Simply order the appropriate product with your custom configuration using the order key in the catalog or our user-guided web configurator. You will then receive modules that are preconfigured to your specifications – even in a minimum quantity of one unit.
## Highly compact signal conditioners with plug-in connection technology

### Analog IN/OUT

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</thead>
<tbody>
<tr>
<td>MINI MCR-2-UNI-UI-URO(-PT)</td>
<td>Universal 4-way signal conditioner with contact, configurable, with switch contact</td>
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<td>MINI MCR-2-UI-UI(-PT)</td>
<td>3-way signal conditioner, configurable</td>
<td>Push-in</td>
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<tr>
<td>MINI MCR-2-U-I(-PT)</td>
<td>3-way signal conditioner, with fixed signal combinations</td>
<td>Push-in</td>
<td>Screw</td>
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<td>3-way signal conditioner, with fixed signal combinations</td>
<td>Push-in</td>
<td>Screw</td>
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<td>MINI MCR-2-U-I3(-PT)</td>
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<tr>
<td>MINI MCR-2-U-I4(-PT)</td>
<td>3-way signal conditioner, with fixed signal combinations</td>
<td>Push-in</td>
<td>Screw</td>
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</table>

### Connection

- **IN**
  - 0...24 mA (freely adjustable), 0...12 V (freely adjustable)
  - Analog: 0...21 mA (freely adjustable), 0...10.5 V (freely adjustable)

### Configuration

- DIP switch
- Configuration: software / app
- Fault signaling: LED
- Fault monitoring: OC/SC/OV/UN/DE
- Fault monitoring: DE
- Termination Carrier (optional)

### Order No.

- Ex n
- 0...10 V

### Web code

- #0492

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*) Versions can also be ordered configured ex works. OC = open circuit, SC = short circuit, OV = over-range, UN = under-range, DE = device error

**Module information:**
- Access module information

**DIP switch setting help:**
- Access module information
- DIP switch setting help
Highly compact signal conditioners with plug-in connection technology

<table>
<thead>
<tr>
<th>Designation</th>
<th>MINI MCR-2-U-I4(-PT)</th>
<th>MINI MCR-2-10-U(-PT)</th>
<th>MINI MCR-2-I4-U(-PT)</th>
<th>MINI MCR-2-RPSS-I-I(-PT)</th>
<th>MINI MCR-2-UNI-UI-2U(-PT)</th>
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<tbody>
<tr>
<td>Description</td>
<td>3-way signal conditioner, with fixed signal combinations</td>
<td>3-way signal conditioner, with fixed signal combinations</td>
<td>3-way signal conditioner, with fixed signal combinations</td>
<td>3-way repeater power supply, with fixed signal combinations</td>
<td>Universal 4-way signal duplicator, configurable</td>
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<tr>
<td>Order No.</td>
<td>2902030 2902029</td>
<td>2902001 2902000</td>
<td>2902003 2902002</td>
<td>2902015 2902014</td>
<td>2905028* 2905026*</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>IN</th>
<th>0…10 V</th>
<th>0…20 mA</th>
<th>4…20 mA</th>
<th>Isolator operation: 0…20 mA, 4…20 mA; IN = OUT</th>
<th>Repeater power supply operation: 4…20 mA; IN = OUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUT</td>
<td>4…20 mA</td>
<td>0…10 V</td>
<td>0…10 V</td>
<td>0…20 mA, 4…20 mA; IN = OUT</td>
<td>2 x 0…21 mA (freely adjustable), 2 x 0…10.5 V (freely adjustable)</td>
</tr>
</tbody>
</table>

| Configuration: DIP switch | * |
| Configuration: software / app | * |
| Fault signaling: LED | * |
| Fault monitoring: OC / SC / OV / UN / DE | * |
| Fault monitoring: DE | * |
| Termination Carrier (optional) | * |

* The module can be snapped onto the DIN rail connector for 24 V voltage bridging
* Wide-range input for worldwide power supply networks

MINI Analog Pro

Web code: #0492
Highly compact signal conditioners with plug-in connection technology

<table>
<thead>
<tr>
<th>Designation</th>
<th>MINI MCR-2-RPSS-I-2I(-PT)</th>
<th>MINI MCR-2-I-I-ILP(-PT)</th>
<th>MINI MCR-2-2I-2I-ILP(-PT)</th>
<th>MINI MCR-2-RPS-I-I-OLP(-PT)</th>
<th>MINI MCR-2-RPS-2I-2I-OLP(-PT)</th>
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<tbody>
<tr>
<td>4-way supply duplicator,</td>
<td>4-way supply duplicator,</td>
<td>Input loop-powered</td>
<td>Output loop-powered</td>
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<td>HART-transparent</td>
<td>Input loop-powered</td>
<td>2-way isolator,</td>
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<td>2-way isolator,</td>
<td>2-way isolator,</td>
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<table>
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<tr>
<th>IN</th>
<th>Isolator operation:</th>
<th>Repeater power supply operation:</th>
<th>Repeater power supply operation:</th>
<th>Repeater power supply operation:</th>
<th>Repeater power supply operation:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0…20 mA, 4…20 mA;</td>
<td>0…20 mA, 2 x 0…20 mA, 2 x 4…20 mA;</td>
<td>0…20 mA, 2 x 0…20 mA, 2 x 4…20 mA;</td>
<td>0…20 mA, 2 x 0…20 mA, 2 x 4…20 mA;</td>
<td>0…20 mA, 2 x 0…20 mA, 2 x 4…20 mA;</td>
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<tr>
<td></td>
<td>IN = OUT</td>
<td>IN = OUT</td>
<td>IN = OUT</td>
<td>IN = OUT</td>
<td>IN = OUT</td>
</tr>
</tbody>
</table>

| OUT         | 2 x 0…20 mA, 2 x 4…20 mA; | 0…20 mA, 2 x 0…20 mA, 2 x 4…20 mA; | 0…20 mA, 2 x 0…20 mA, 2 x 4…20 mA; | 0…20 mA, 2 x 0…20 mA, 2 x 4…20 mA; | 0…20 mA, 2 x 0…20 mA, 2 x 4…20 mA; |
|             | IN = OUT            | IN = OUT                         | IN = OUT                         | IN = OUT                         | IN = OUT                         |

Configuration:
- DIP switch
- Configuration: software/app
- Fault signaling: LED
- Fault monitoring: OC/SC/OV/UN/DE
- Termination Carrier (optional)

*) Versions can also be ordered configured ex works. OC = open circuit, SC = short circuit, OV = over-range, UN = under-range, DE = device error

Module information:
- Access module information

DIP switch setting help:
- Access module information
- DIP switch setting help
## Highly compact signal conditioners with plug-in connection technology

### Analog IN/OUT | Temperature | Frequency | Web code: #0492

<table>
<thead>
<tr>
<th>MINI Analog Pro</th>
<th>MINI MCR-2-UI-LOLP(-PT)</th>
<th>MINI MCR-2-RTD-UI(-PT)</th>
<th>MINI MCR-2-TC-UI(-PT)</th>
<th>MINI MCR-2-F-UI(-PT)</th>
<th>MINI MCR-2-UI-FRO(-PT)</th>
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</thead>
<tbody>
<tr>
<td>Order No.</td>
<td>2902063</td>
<td>2902061</td>
<td>2902052</td>
<td>2902049</td>
<td>2905249</td>
</tr>
</tbody>
</table>

### Designation

**MINI MCR-2-UI-LOLP(-PT)**
- Output loop-powered 2-way isolator
- Universal measuring transducer for 2-, 3-, 4-conductor RTDs, configurable

**MINI MCR-2-RTD-UI(-PT)**
- Universal measuring transducer for TCs, configurable

**MINI MCR-2-TC-UI(-PT)**
- Frequency transducer / limit value switch, configurable

**MINI MCR-2-F-UI(-PT)**
- Analog frequency transducer / limit value switch, configurable

### Connection

- **IN**
  - Unipolar and bipolar: 0…2 mA to 0…40 mA (16 ranges), 0…50 mV to 0…30 V (58 ranges)
  - Linear resistance: 0…4 kΩ
  - Temperature: -200°C … +850°C (depending on the sensor)

- **OUT**
  - 4…20 mA (freely adjustable), 0…10.5 V (freely adjustable)
  - Frequency: 0…10 kHz (freely adjustable), PWM output: 0…100%

### Configuration

- **DIP switch**
- **Configuration: software / app**
- **Fault signaling:** LED
- **Fault monitoring:** OC/SC/OV/UN/DE
- **Fault monitoring:** DE
- **Termination Carrier (optional)**

### Web code:

- #0492

### Description

- **MINI Analog Pro**
  - Highly compact signal conditioners with plug-in connection technology
  - Analog IN/OUT
  - Temperature
  - Frequency
  - Web code: #0492

- **Designation**
  - MINI MCR-2-UI-LOLP(-PT)
  - MINI MCR-2-RTD-UI(-PT)
  - MINI MCR-2-TC-UI(-PT)
  - MINI MCR-2-F-UI(-PT)
  - MINI MCR-2-UI-FRO(-PT)

- **Connection**
  - Push-in | Screw
  - Push-in | Screw
  - Push-in | Screw
  - Push-in | Screw

- **Order No.**
  - 2902063
  - 2902061
  - 2902052
  - 2902049
  - 2905249
  - 2902055
  - 2902058
  - 2902056
  - 2902032
  - 2902031

- **IN**
  - Unipolar and bipolar: 0…2 mA to 0…40 mA (16 ranges), 0…50 mV to 0…30 V (58 ranges)
  - Linear resistance: 0…4 kΩ
  - Temperature: -200°C … +850°C (depending on the sensor)

- **OUT**
  - 4…20 mA (freely adjustable), 0…10.5 V (freely adjustable)
  - Frequency: 0…10 kHz (freely adjustable), PWM output: 0…100%

- **Configuration**
  - **DIP switch**
  - **Configuration: software / app**
  - **Fault signaling:** LED
  - **Fault monitoring:** OC/SC/OV/UN/DE
  - **Fault monitoring:** DE
  - **Termination Carrier (optional)**

- **Web code:** #0492

- **The module can be snapped onto the DIN rail connector for 24 V voltage bridging**

- **Wide-range input for worldwide power supply networks**

**PHOENIX CONTACT 19**
Highly compact signal conditioners with plug-in connection technology

<table>
<thead>
<tr>
<th>Designation</th>
<th>Potentiometers</th>
<th>Digital IN</th>
<th>Limit values</th>
<th>Web code: #0492</th>
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</thead>
<tbody>
<tr>
<td>MINI MCR-2-POT-UI(-PT)</td>
<td>Potentiometer measuring transducer, configurable</td>
<td>NAMUR signal conditioner, configurable</td>
<td>Limit value switch, configurable</td>
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</tr>
<tr>
<td>MINI MCR-2-NAM-2RO(-PT)</td>
<td>3-wire potentiometer: 100 Ω…100 kΩ, automatic detection</td>
<td>NAMUR proximity sensors, floating switch contacts, switch contacts with resistance circuit</td>
<td>Universal limit value switch for 2-, 3-, 4-conductor RTDs and TCs, configurable</td>
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<tr>
<td>MINI MCR-2-UI-REL(-PT)</td>
<td>Digital IN</td>
<td>Limit value switch, configurable</td>
<td>Universal limit value switch for 2-, 3-, 4-conductor RTDs and TCs, configurable</td>
<td></td>
</tr>
<tr>
<td>MINI MCR-2-T-REL(-PT)</td>
<td>Digital IN</td>
<td>Limit value switch, configurable</td>
<td>Universal limit value switch for 2-, 3-, 4-conductor RTDs and TCs, configurable</td>
<td></td>
</tr>
<tr>
<td>MINI MCR-2-T2RO(-PT)</td>
<td>Digital IN</td>
<td>Limit value switch, configurable</td>
<td>Universal limit value switch for 2-, 3-, 4-conductor RTDs and TCs, configurable</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Order No.</td>
<td>2902017</td>
<td>2902016</td>
<td>2902005</td>
<td>2902004</td>
<td>2902035</td>
<td>2902033</td>
<td>2905633</td>
<td>2905632</td>
<td>2906877</td>
<td>2906876</td>
</tr>
<tr>
<td>Ex</td>
<td>Ex n</td>
<td>Ex n</td>
<td>Ex n</td>
<td>Ex n</td>
<td>Ex n</td>
<td>Ex n</td>
<td>Ex n</td>
<td>Ex n</td>
<td>Ex n</td>
<td>Ex n</td>
</tr>
</tbody>
</table>

| IN         | 3-wire potentiometer: 100 Ω…100 kΩ, automatic detection | NAMUR proximity sensors, floating switch contacts, switch contacts with resistance circuit | 0…24 mA (freely adjustable), 0…12 V (freely adjustable) | |
| OUT        | 0…21 mA (freely adjustable), 0…10.5 V (freely adjustable) | 2 N/O transistor outputs, 1 output, can be used either for signal duplication or error messaging | 1 PDT relay | 1 N/O relay | 2 N/O transistor outputs |

Configuration: DIP switch: * * * * *
Configuration: software / app: * * *
Fault signaling: LED: * * *
Fault monitoring: OC/SC/OV/UN/DE: * * *
Fault monitoring: DE: *
Termination Carrier (optional): * * *

*) Versions can also be ordered configured ex works. OC = open circuit, SC = short circuit, OV = over-range, UN = under-range, DE = device error

Module information:
• Access module information

DIP switch setting help:
• Access module information
• DIP switch setting help

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Highly compact signal conditioners with plug-in connection technology

<table>
<thead>
<tr>
<th>Designation</th>
<th>MINI MCR-2-CVCS(-PT)</th>
<th>MINI MCR-2-PTB(-PT)</th>
<th>MINI MCR-2-FM-RC(-PT)</th>
<th>MINI MCR-2-TB</th>
<th>MINI MCR-2-SPS-24-15(-PT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order No.</td>
<td>2902065</td>
<td>2902064</td>
<td>2902067</td>
<td>2902066</td>
<td>2904508</td>
</tr>
<tr>
<td>Ex</td>
<td>Ex n</td>
<td>Ex n</td>
<td>Ex n</td>
<td>Ex n</td>
<td>Ex n</td>
</tr>
</tbody>
</table>

### Description
- **Constant voltage / current source**: Feed-in terminal
- **Feed-through terminal block, 1:1 connection**: Fault monitoring module
- **Feed-in terminal**: Fault monitoring module for evaluation and group error messaging in the fault monitoring system
- **Constant voltage source, sensor power supply**: Feed-through terminal block for 1:1 forwarding of signals that are already electrically isolated in the MINI Analog Pro group

### Configuration
- **DIP switch**
- **software / app**
- **LED**
- **OC / SC / OV / UN / DE**
- **DE**
- **Termination Carrier (optional)**

### Accessories
- **MINI Analog Pro**
- **MINI MCR-2-CVCS(-PT)**
- **MINI MCR-2-PTB(-PT)**
- **MINI MCR-2-FM-RC(-PT)**
- **MINI MCR-2-TB**
- **MINI MCR-2-SPS-24-15(-PT)**

**Wide-range input for worldwide power supply networks**

The module can be snapped onto the DIN rail connector for 24 V voltage bridging.

---

PHOENIX CONTACT 21
Signal conditioners with functional safety and explosion protection

<table>
<thead>
<tr>
<th>Designation</th>
<th>MACX MCR-UI-UI(-SP)-NC</th>
<th>MACX MCR-UI-UI-UP(-SP)-NC</th>
<th>MACX MCR-SL-RPSSI-I(-SP)</th>
<th>MACX MCR-EX-SL-RPSSI-I(-SP)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Universal 3-way signal conditioner, configurable</strong></td>
<td>Universal 3-way signal conditioner, configurable, wide-range supply</td>
<td>Repeater power supply and input signal conditioner, HART-transparent</td>
<td>Ex i repeater power supply and input signal conditioner, HART-transparent, input [Ex ia]</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Order No.</td>
<td>2811556 (^a)</td>
<td>2811446 (^a)</td>
<td>2811569 (^a)</td>
<td>2811297 (^a)</td>
</tr>
<tr>
<td>Ex</td>
<td>Ex n</td>
<td>Ex n</td>
<td>Ex n</td>
<td>Ex n, Ex i</td>
</tr>
<tr>
<td>SIL</td>
<td>SIL 2</td>
<td>SIL 2</td>
<td>SIL 2</td>
<td>SIL 2</td>
</tr>
<tr>
<td>PL</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Overall width in mm</td>
<td>12.5</td>
<td>12.5</td>
<td>12.5</td>
<td></td>
</tr>
</tbody>
</table>

**IN**

- **Unipolar:**
  - 0 ... 50 mV to 0 ... 100 V
  - 0 ... 1 mA to 0 ... 100 mA
- **Bipolar:**
  - -50 ... 50 mV to -100 ... 100 V
  - -1 ... 1 mA to -100 ... 100 mA
- **Live zero:**
  - 1 ... 5 mA, 2 ... 10 mA
  - 4 ... 20 mA, 1 ... 5 V, 2 ... 10 V

**OUT**

- **Unipolar:**
  - 0 ... 50 mV to 0 ... 10 V
  - 0 ... 1 mA to 0 ... 20 mA
- **Bipolar:**
  - -50 ... 50 mV to -10 ... 10 V
  - -1 ... 1 mA to -20 ... 20 mA
- **Live zero:**
  - 1 ... 5 mA, 2 ... 10 mA
  - 4 ... 20 mA, 1 ... 5 V, 2 ... 10 V

**Configuration:**

- DIP switch
- Software
- HART-transparent
- Fault signaling: LED
- Fault monitoring: OC / SC
- Termination Carrier (optional)

\(^a\) Versions can also be ordered configured ex works. OC = open circuit, SC = short circuit, OV = over-range, UN = under-range, DE = device error

Web code: #1143
## Signal conditioners with functional safety and explosion protection

<table>
<thead>
<tr>
<th>Designation</th>
<th>MACX MCR-SL-RPSSI-2I(-SP)</th>
<th>MACX MCR-EX-SL-RPSSI-2I(-SP)</th>
<th>MACX MCR-EX-SL-RPSSI-2I-1S(-SP)</th>
<th>MACX MCR-SL-RPSS-2I-2I(-SP)</th>
<th>MACX MCR-EX-SL-RPSS-2I-2I(-SP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>Push-in, Screw</td>
<td>Push-in, Screw</td>
<td>Push-in, Screw</td>
<td>Push-in, Screw</td>
<td>Push-in, Screw</td>
</tr>
<tr>
<td>Order No.</td>
<td>2924838, 2924825</td>
<td>2924236, 2865366</td>
<td>2908856, 2908855</td>
<td>2904090, 2904089</td>
<td>2924676, 2865382</td>
</tr>
<tr>
<td>Ex</td>
<td>Ex n</td>
<td>Ex n, Ex i</td>
<td>Ex n, Ex i</td>
<td>Ex n</td>
<td>Ex n, Ex i</td>
</tr>
<tr>
<td>SIL</td>
<td>SIL 2</td>
<td>SIL 2</td>
<td>SIL 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PL</td>
<td>PL d</td>
<td>PL d</td>
<td>PL d</td>
<td>PL d</td>
<td></td>
</tr>
<tr>
<td>Overall width in mm</td>
<td>12.5</td>
<td>12.5</td>
<td>12.5</td>
<td>12.5</td>
<td>12.5</td>
</tr>
</tbody>
</table>

### IN
- Input isolator operation: 4 … 20 mA (0 … 20 mA)
- Repeater power supply operation: 4 … 20 mA
- Transmitter supply voltage: >16 V (20 mA)

### OUT
- 2 x 0 … 20 mA, 2 x 4 … 20 mA (functionally safe) [IN = OUT]
- Load ≤450 Ω (20 mA)
- Repeater power supply operation: 2 x 4 … 20 mA
- Transmitter supply voltage: >16 V (20 mA) per channel
- 2 x 0 … 20 mA, 2 x 4 … 20 mA (functionally safe) [IN = OUT]
- Load ≤450 Ω (20 mA)
- 2 x 4 … 20 mA (functionally safe) [IN = OUT]
- Load ≤450 Ω (20 mA)

- Configuration: DIP switch
- Configuration: software
- HART-transparent
- Fault signaling: LED
- Fault monitoring: OC / SC
- Termination Carrier (optional)

Web code: #1143

- The module can be snapped onto the DIN rail connector for 24 V voltage bridging
- Wide-range input for worldwide power supply networks

**PHOENIX CONTACT** 23
## Signal conditioners with functional safety and explosion protection

**Analog IN / OUT**

<table>
<thead>
<tr>
<th>Designation</th>
<th>Description</th>
<th>Connection</th>
<th>Order No.</th>
<th>Ex</th>
<th>SIL</th>
<th>PL</th>
<th>Overall width in mm</th>
<th>Web code: #1143</th>
</tr>
</thead>
<tbody>
<tr>
<td>MACX MCR-SL-RPSSI-I-UP(-SP)</td>
<td>Repeater power supply and input signal conditioner, HART-transparent, wide-range supply</td>
<td>Push-in</td>
<td>2924210</td>
<td>Ex n</td>
<td>SIL 2</td>
<td>-</td>
<td>17.5</td>
<td></td>
</tr>
<tr>
<td>MACX MCR-EX-SL-RPSSI-I-UP(-SP)</td>
<td>Repeater power supply and input signal conditioner, HART-transparent, wide-range supply</td>
<td>Screw</td>
<td>2865968</td>
<td>Ex n, Ex i</td>
<td>SIL 3</td>
<td>-</td>
<td>12.5</td>
<td></td>
</tr>
<tr>
<td>MACX MCR-SL-I-ILP(-SP)</td>
<td>Input loop-powered 2-way isolator, single-channel</td>
<td>Push-in</td>
<td>2905279</td>
<td>Ex n</td>
<td>SIL 3</td>
<td>-</td>
<td>12.5</td>
<td></td>
</tr>
<tr>
<td>MACX MCR-SL-2I-2I-ILP(-SP)</td>
<td>Input loop-powered 2-way isolator, two-channel</td>
<td>Push-in</td>
<td>2905281</td>
<td>Ex n</td>
<td>SIL 3</td>
<td>-</td>
<td>12.5</td>
<td></td>
</tr>
</tbody>
</table>

### IN
- Input isolator operation:
  - 4 … 20 mA (0 … 20 mA)
- Repeater power supply operation:
  - 4 … 20 mA
- Transmitter supply voltage:
  - >16 V (20 mA)

### OUT
- 4 … 20 mA (functionally safe) (0 … 20 mA) active / passive,
  - 1 … 5 V (0 … 5 V);
  - IN = OUT
  - Load ≤600 Ω (20 mA)

Configuration:
- DIP switch
- Configuration: software
  - HART-transparent
  - Fault signaling: LED
  - Fault monitoring: OC / SC
  - Termination Carrier (optional)

*) Versions can also be ordered configured ex works. OC = open circuit, SC = short circuit, OV = over-range, UN = under-range, DE = device error
Signal conditioners with functional safety and explosion protection

<table>
<thead>
<tr>
<th>Designation</th>
<th>MACX MCR-SL-I-I-HV-ILP(-SP)</th>
<th>MACX MCR-SL-2I-2I-HV-ILP(-SP)</th>
<th>MACX MCR-SL-IDSI-I(-SP)</th>
<th>MACX MCR-EX-SL-IDSI-I(-SP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>Push-in, Screw</td>
<td>Push-in, Screw</td>
<td>Push-in, Screw</td>
<td>Push-in, Screw</td>
</tr>
<tr>
<td>Order No.</td>
<td>2907705, 2907704</td>
<td>2907707, 2907706</td>
<td>2924223, 2865971</td>
<td>2924032, 2865405</td>
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<tr>
<td>Ex</td>
<td>Ex, Ex</td>
<td>Ex, Ex</td>
<td>Ex, Ex, Ex</td>
<td>Ex, Ex</td>
</tr>
<tr>
<td>SIL</td>
<td>SIL 3, SIL 3</td>
<td>SIL 3, SIL 3</td>
<td>SIL 2, SIL 2</td>
<td>Ex i, Ex i</td>
</tr>
<tr>
<td>PL</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Overall width in mm</td>
<td>12.5, 12.5</td>
<td>12.5</td>
<td>12.5</td>
<td>12.5</td>
</tr>
</tbody>
</table>

**IN**

- 0 … 20 mA, 4 … 20 mA; IN = OUT
- 2 x 0 … 20 mA, 2 x 4 … 20 mA; IN = OUT

**OUT**

- 0 … 20 mA, 4 … 20 mA (functionally safe); IN = OUT
- 2 x 0 … 20 mA, 2 x 4 … 20 mA (functionally safe); IN = OUT

4 … 20 mA (functionally safe) (0 … 20 mA); IN = OUT

With line fault detection

**Configuration:**
- DIP switch
- Software
- HART-transparent
- Fault signaling: LED
- Fault monitoring: OC / SC
- Termination Carrier (optional)

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

The module can be snapped onto the DIN rail connector for 24 V voltage bridging.

Wide-range input for worldwide power supply networks.

PHOENIX CONTACT  25
Signal conditioners with functional safety and explosion protection

<table>
<thead>
<tr>
<th>Designation</th>
<th>MACX MCR-T-UI-UP(-SP)</th>
<th>MACX MCR-EX-T-UI-UP(-SP)</th>
<th>MACX MCR-T-UIREL-UP(-SP)</th>
<th>MACX MCR-EX-T-UIREL-UP-SP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Universal temperature transducer, with limit value relay, wide-range supply, configurable</td>
<td>Universal Ex i temperature transducer, with limit value relay, wide-range supply, configurable, input [Ex ia]</td>
<td>Universal temperature transducer, with three limit value relays, wide-range supply, configurable</td>
<td>Universal temperature transducer, with three limit value relays, wide-range supply, configurable, input [Ex ia]</td>
</tr>
<tr>
<td>Order No.</td>
<td>2811860&lt;sup&gt;)&lt;/sup&gt;</td>
<td>2811394&lt;sup&gt;)&lt;/sup&gt;</td>
<td>2924689&lt;sup&gt;)&lt;/sup&gt;</td>
<td>2865654&lt;sup&gt;)&lt;/sup&gt;</td>
</tr>
<tr>
<td>Ex</td>
<td>Ex n</td>
<td>Ex n, Ex i</td>
<td>Ex n</td>
<td>Ex n, Ex i</td>
</tr>
<tr>
<td>SIL</td>
<td>SIL 2</td>
<td>SIL 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PL</td>
<td>PL d</td>
<td>PL d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall width in mm</td>
<td>17.5</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN</td>
<td>RTD: Pt10 ... Pt10000, Ni10 ... Ni10000, Cu10, Cu53, KTY, TC 1): type B, E, J, K, N, R, S, T, L, U, C, D, A-1, A-2, A-3, M, L</td>
<td>Potentiometer: 0 ... 50 kΩ</td>
<td>Linear resistance: 0 ... 50 kΩ</td>
<td>±1,000 mV, ±20 mA</td>
</tr>
<tr>
<td>OUT</td>
<td>Analog: 0 ... 20 mA, -10 ... 10 V (freely scalable), 4 ... 20 mA (functionally safe)</td>
<td>Digital: 1 PDT relay</td>
<td>Analog: 0 ... 20 mA, -10 ... 10 V (freely scalable), 4 ... 20 mA (functionally safe)</td>
<td>Digital: 3 PDT relays, combination of relay 2 and 3 functionally safe</td>
</tr>
<tr>
<td>Configuration: DIP switch</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Configuration: software</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HART-transparent</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fault signaling: LED</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fault monitoring: OC / SC</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Termination Carrier (optional)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*) Versions can also be ordered configured ex works. OC = open circuit, SC = short circuit, OV = over-range, UN = under-range, DE = device error

Web code: #1143
## Signal conditioners with functional safety and explosion protection

<table>
<thead>
<tr>
<th>Temperature</th>
<th></th>
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<tbody>
<tr>
<td><strong>Designation</strong></td>
<td><strong>MACX MCR-RTD-I(-SP)</strong></td>
</tr>
<tr>
<td></td>
<td>Temperature transducer for RTD sensors, configurable</td>
</tr>
<tr>
<td><strong>Connection</strong></td>
<td>Push-in</td>
</tr>
<tr>
<td><strong>Order No.</strong></td>
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</tr>
<tr>
<td><strong>Ex</strong></td>
<td>Ex n</td>
</tr>
<tr>
<td><strong>SIL</strong></td>
<td>SIL 2</td>
</tr>
<tr>
<td><strong>PL</strong></td>
<td>-</td>
</tr>
<tr>
<td><strong>Overall width in mm</strong></td>
<td>12.5</td>
</tr>
<tr>
<td><strong>IN</strong></td>
<td>RTD: Pt10 … Pt10000, Ni10 … Ni10000, Cu10, Cu53, KTY</td>
</tr>
<tr>
<td><strong>OUT</strong></td>
<td>4 ... 20 mA (functionally safe)</td>
</tr>
</tbody>
</table>

**Configuration:**
- DIP switch
- software

**HART-transparent**
- Fault signaling: LED
- Fault monitoring: OC / SC
- Termination Carrier (optional)

---

The module can be snapped onto the DIN rail connector for 24 V voltage bridging

Wide-range input for worldwide power supply networks
### Signal conditioners with functional safety and explosion protection

<table>
<thead>
<tr>
<th>Potentiometers</th>
<th>Limit values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MACX Analog</strong></td>
<td><strong>Universal temperature transducer, with limit value relay, wide-range supply, configurable</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Designation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MACX MCR-TUI-UP(-SP)</td>
<td>Universal temperature transducer, with three limit value relays, wide-range supply, configurable, input [Ex ia]</td>
</tr>
<tr>
<td>MACX MCR-EX-TUI-UP(-SP)</td>
<td>Universal temperature transducer, with limit value relay, wide-range supply, configurable, input [Ex ia]</td>
</tr>
<tr>
<td>MACX MCR-TUIREL-UP(-SP)</td>
<td>Universal temperature transducer, with three limit value relays, wide-range supply, configurable</td>
</tr>
<tr>
<td>MACX MCR-EX-TUIREL-UP(-SP)</td>
<td>Universal temperature transducer, with limit value relay, wide-range supply, configurable, input [Ex ia]</td>
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</table>

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
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<td>2811394*)</td>
<td>2924689*)</td>
<td>2865654*)</td>
<td>2811828*)</td>
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<td>Ex n, Ex i</td>
<td>Ex n</td>
<td>Ex n, Ex i</td>
<td>Ex n</td>
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<td>SIL 2</td>
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</tr>
<tr>
<td>PL</td>
<td>PL d</td>
<td>PL d</td>
<td>PL d</td>
<td>PL d</td>
<td>PL d</td>
</tr>
<tr>
<td>Width [mm]</td>
<td>17.5</td>
<td>35</td>
<td>17.5</td>
<td>35</td>
<td>17.5</td>
</tr>
</tbody>
</table>

**RTD:** Pt10 … Pt10000, Ni10 … Ni10000, Cu10, Cu53, KTY


**Potentiometer:** 0 … 50 kΩ

**Linear resistance:** 0 … 50 kΩ

±1,000 mV, ±20 mA

**OUT**

**Analog:**

0 … 20 mA, -10 … 10 V (freely scalable), 4 … 20 mA (functionally safe)

**Digital:**

1 PDT relay

**Configuration:**

DIP switch

Software

HART-transparent

Fault signaling: LED

Fault monitoring: OC / SC

Termination Carrier (optional)

*) Versions can also be ordered configured ex works. OC = open circuit, SC = short circuit, OV = over-range, UN = under-range, DE = device error.
## Signal conditioners with functional safety and explosion protection

<table>
<thead>
<tr>
<th>Limit values</th>
<th>Web code: #1143</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MACX Analog</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Designation</strong></td>
<td><strong>MACX MCR-EX-T-UI-UP(-SP)</strong></td>
</tr>
<tr>
<td>Universal Ex i temperature transducer, with limit value relay, wide-range supply, configurable, input [Ex ia]</td>
<td>Universal temperature transducer, with three limit value relays, wide-range supply, configurable</td>
</tr>
<tr>
<td><strong>Connection</strong></td>
<td>Push-in</td>
</tr>
<tr>
<td><strong>Order No.</strong></td>
<td>2924689*</td>
</tr>
<tr>
<td>Ex</td>
<td>Ex n, Ex i</td>
</tr>
<tr>
<td>SIL</td>
<td>SIL 2</td>
</tr>
<tr>
<td>PL</td>
<td>PL d</td>
</tr>
<tr>
<td>Width [mm]</td>
<td>17.5</td>
</tr>
</tbody>
</table>

**IN**

- RTD: Pt10 … Pt10000, Ni10 … Ni10000, Cu10, Cu53, KTY
  - Potentiometer: 0 … 50 kΩ
  - Linear resistance: 0 … 50 kΩ ±1,000 mV, ±20 mA

**OUT**

- Analog: 0 … 20 mA, -10 … 10 V (freely scalable), 4 … 20 mA (functionally safe)
- Digital: 1 PDT relay

- Analog: 0 … 20 mA, -10 … 10 V (freely scalable), 4 … 20 mA (functionally safe)
- Digital: 3 PDT relays, combination of relay 2 and 3 functionally safe

- Configuration: DIP switch
- Configuration: software
- HART-transparent
- Fault signaling: LED
- Fault monitoring: OC / SC
- Termination Carrier (optional)

*The module can be snapped onto the DIN rail connector for 24 V voltage bridging*

*Wide-range input for worldwide power supply networks*
Signal conditioners with functional safety and explosion protection

<table>
<thead>
<tr>
<th>Designation</th>
<th>Digital IN</th>
<th>Web code: #1143</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MACX MCR-SL-NAM-R(-SP)</strong></td>
<td>NAMUR signal conditioner, PDT output</td>
<td></td>
</tr>
<tr>
<td><strong>MACX MCR-EX-SL-NAM-R(-SP)</strong></td>
<td>Ex i NAMUR signal conditioner, PDT output, input [Ex ia]</td>
<td></td>
</tr>
<tr>
<td><strong>MACX MCR-SL-NAM-2RO(-SP)</strong></td>
<td>NAMUR signal conditioner, 2 N/O outputs</td>
<td></td>
</tr>
<tr>
<td><strong>MACX MCR-EX-SL-NAM-2RO(-SP)</strong></td>
<td>Ex i NAMUR signal conditioner, 2 N/O outputs, input [Ex ia]</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Order No.</td>
<td>2924252 2865997</td>
<td>2924045 2865434</td>
<td>2924265 2865010</td>
<td>2924061 2865450</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ex</th>
<th>Ex n, Ex i</th>
<th>Ex n, Ex i</th>
<th>Ex n, Ex i</th>
<th>Ex n, Ex i</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIL</td>
<td>SIL 2</td>
<td>SIL 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall width in mm</td>
<td>12.5</td>
<td>12.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**IN**
- NAMUR proximity sensors
- Unconnected contacts or contacts with resistance circuit
- Line fault detection can be switched on/off
- Direction of action can be selected

**OUT**
- 1 PDT relay
- 250 V AC (2 A), 120 V DC (0.2 A), 30 V DC (2 A)

- 2 N/O relays
- 250 V AC (2 A), 120 V DC (0.2 A), 30 V DC (2 A)
- Signal output 2 can be configured as a duplicator or an error message output

**Configuration:**
- DIP switch
- Software

**HART-transparent**
- Fault signaling: LED
- Fault monitoring: OC / SC
- Termination Carrier (optional)

*) Versions can also be ordered configured ex works. OC = open circuit, SC = short circuit, OV = over-range, UN = under-range, DE = device error
## Signal conditioners with functional safety and explosion protection

<table>
<thead>
<tr>
<th>Digital IN</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="MACX Analog" /></td>
<td><a href="#">Web code: #1143</a></td>
</tr>
</tbody>
</table>

### Designation

<table>
<thead>
<tr>
<th>Designation</th>
<th>MACX MCR-SL-2NAM-RO(-SP)</th>
<th>MACX MCR-EX-SL-2NAM-RO(-SP)</th>
<th>MACX MCR-SL-2NAM-R-UP(-SP)</th>
<th>MACX MCR-EX-SL-2NAM-R-UP(-SP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MACX MCR-SL-2NAM-RO(-SP)</td>
<td>NAMUR signal conditioner, two-channel, N/O output</td>
<td>Ex i NAMUR signal conditioner, two-channel, N/O output, input [Ex ia]</td>
<td>NAMUR signal conditioner, two-channel, PDT output, wide-range supply</td>
<td>Ex i NAMUR signal conditioner, two-channel, PDT output, wide-range supply, input [Ex ia]</td>
</tr>
</tbody>
</table>

### Connection

|------------|--------|-------|--------|-------|--------|-------|--------|-------|

### Order No.

<table>
<thead>
<tr>
<th>Order No.</th>
<th>2924294</th>
<th>2865049</th>
<th>2924087</th>
<th>2865476</th>
<th>2924304</th>
<th>2865052</th>
<th>2924249</th>
<th>2865984</th>
</tr>
</thead>
</table>

### Ex

<table>
<thead>
<tr>
<th>Ex</th>
<th>Ex n, Ex i</th>
<th>Ex n</th>
<th>Ex n, Ex i</th>
</tr>
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</table>

### SIL

<table>
<thead>
<tr>
<th>SIL</th>
<th>SIL 2</th>
<th>SIL 2</th>
</tr>
</thead>
</table>

### PL

<table>
<thead>
<tr>
<th>PL</th>
<th></th>
</tr>
</thead>
</table>

### Overall width in mm

<table>
<thead>
<tr>
<th>Overall width in mm</th>
<th>12.5</th>
<th>17.5</th>
</tr>
</thead>
</table>

### IN

**NAMUR proximity sensors**
- Unconnected contacts or contacts with resistance circuit
- Line fault detection can be switched on / off
- Direction of action can be selected

### OUT

<table>
<thead>
<tr>
<th>OUT</th>
<th>1 N/O relay per channel</th>
<th>1 PDT relay per channel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>250 V AC (2 A), 120 V DC (0.2 A), 30 V DC (2 A)</td>
<td>250 V AC (2 A), 120 V DC (0.2 A), 30 V DC (2 A)</td>
</tr>
</tbody>
</table>

### Configuration:

- DIP switch
- Configuration: software
- HART-transparent
- Fault signaling: LED
- Fault monitoring: OC / SC
- Termination Carrier (optional)

---

- The module can be snapped onto the DIN rail connector for 24 V voltage bridging
- Wide-range input for worldwide power supply networks

---

**PHOENIX CONTACT** 31
## Signal conditioners with functional safety and explosion protection

<table>
<thead>
<tr>
<th>Digital IN</th>
<th>Web code: #1143</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Designation</th>
<th>MACX MCR-SL-NAM-2T(-SP)</th>
<th>MACX MCR-EX-SL-NAM-2T(-SP)</th>
<th>MACX MCR-SL-2NAMT(-SP)</th>
<th>MACX MCR-EX-SL-2NAM-T(-SP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAMUR signal conditioner, two transistor outputs</td>
<td>Ex i NAMUR signal conditioner, two transistor outputs, input [Ex ia]</td>
<td>NAMUR signal conditioner, two-channel, transistor output</td>
<td>Ex i NAMUR signal conditioner, two-channel, transistor output, input [Ex ia]</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Order No.</td>
<td>2924278</td>
<td>2865023</td>
<td>2924249</td>
<td>2865984</td>
<td>2924281</td>
<td>2865036</td>
<td>2924090</td>
<td>2865489</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ex</th>
<th>Ex n</th>
<th>Ex n, Ex i</th>
<th>Ex n</th>
<th>Ex n, Ex i</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>SIL</th>
<th>SIL 2</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>PL</th>
<th></th>
</tr>
</thead>
</table>

| Overall width in mm | 12.5 | 12.5 |

### IN
- **NAMUR proximity sensors**
- Unconnected contacts or contacts with resistance circuit
- Line fault detection can be switched on / off
- Direction of action can be selected

### OUT
- 2 transistor outputs, passive
  - Switching voltage / current: max. 30 V DC / 50 mA
  - Switching frequency: max. 5 kHz
  - Signal output 2 can also be configured as an error message output
- 1 transistor output per channel, passive
  - Switching voltage / current: max. 30 V DC / 50 mA
  - Switching frequency: max. 5 kHz

### Configuration:
- DIP switch
- **software**

### HART-transparent

### Fault signaling:
- **LED**

### Fault monitoring:
- **OC / SC**

### Termination Carrier (optional)

*) Versions can also be ordered configured ex works. OC = open circuit, SC = short circuit, OV = over-range, UN = under-range, DE = device error
## Signal conditioners with functional safety and explosion protection

<table>
<thead>
<tr>
<th>Designation</th>
<th>MACX MCR-EX-SL-NAM-NAM(-SP)</th>
<th>MACX MCR-EX-SL-NAM-YO(-SP)</th>
<th>MACX MCR-EX-SL-NAM-HO(-SP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAMUR signal conditioner, output with resistive behavior, with line fault transparency, input [Ex ia]</td>
<td>NAMUR signal conditioner, output with resistive behavior, Yokogawa-compatible, with line fault transparency, input [Ex ia]</td>
<td>NAMUR signal conditioner, output with resistive behavior, Honeywell-compatible, with line fault transparency, input [Ex ia]</td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td>Push-in</td>
<td>Screw</td>
<td>Push-in</td>
</tr>
<tr>
<td>Order No.</td>
<td>2924090</td>
<td>2865489</td>
<td>2905724</td>
</tr>
<tr>
<td>Ex</td>
<td>Ex n, Ex i</td>
<td>Ex n, Ex i</td>
<td>Ex n, Ex i</td>
</tr>
<tr>
<td>SIL</td>
<td>SIL 2</td>
<td>SIL 2</td>
<td>SIL 2</td>
</tr>
<tr>
<td>PL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall width in mm</td>
<td>12.5</td>
<td>12.5</td>
<td>12.5</td>
</tr>
</tbody>
</table>

### Digital IN
- NAMUR proximity sensors
- Unconnected contacts or contacts with resistance circuit
- Line fault detection can be switched on / off
- Direction of action can be selected

### Wide-range input
- Resistive behavior in accordance with EN 60947-5-6
- Switching voltage: 8.2 V DC
- Switching frequency: max. 5 kHz

### OUT
- Resistive behavior, voltage drop, 1 signal: 6.5 V
- Switching frequency: max. 5 kHz

### Configuration:
- DIP switch
- HART-transparent
- Fault signaling: LED
- Fault monitoring: OC / SC
- Termination Carrier (optional)

### Notes:
- The module can be snapped onto the DIN rail connector for 24 V voltage bridging
- Wide-range input for worldwide power supply networks
### Signal conditioners with functional safety and explosion protection

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>Push-in</td>
<td>Push-in</td>
<td>Push-in</td>
<td>Push-in</td>
</tr>
<tr>
<td>Order No.</td>
<td>2905674</td>
<td>2905669</td>
<td>2924870</td>
<td>2924867</td>
</tr>
<tr>
<td>Ex</td>
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<td>Ex n, Ex i</td>
<td>Ex n, Ex i</td>
<td>Ex n, Ex i</td>
</tr>
<tr>
<td>SIL</td>
<td>SIL 3</td>
<td>SIL 3</td>
<td>SIL 3</td>
<td>SIL 3</td>
</tr>
<tr>
<td>PL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall width in mm</td>
<td>12.5</td>
<td>12.5</td>
<td>12.5</td>
<td>12.5</td>
</tr>
<tr>
<td>IN</td>
<td>Switching level 0 signal (L):</td>
<td>Switching level 0 signal (L):</td>
<td>Switching level 0 signal (L):</td>
<td>20 ... 30 V DC, (45 mA at Ue = 24 V DC)</td>
</tr>
<tr>
<td></td>
<td>0 ... 5 V DC</td>
<td>0 ... 5 V DC</td>
<td>0 ... 5 V DC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Switching level 1 signal (H):</td>
<td>Switching level 1 signal (H):</td>
<td>Switching level 1 signal (H):</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 ... 30 V DC</td>
<td>15 ... 30 V DC</td>
<td>15 ... 30 V DC</td>
<td></td>
</tr>
<tr>
<td>OUT</td>
<td>4.64 V DC (at 25.1 mA)</td>
<td>9.7 V DC (at 48 mA)</td>
<td>9.5 V DC (at 48 mA)</td>
<td>5.5 V DC (at 25 mA)</td>
</tr>
<tr>
<td></td>
<td>Current limitation: 25.1 mA</td>
<td>Current limitation: 48 mA</td>
<td>Current limitation: 48 mA</td>
<td>Current limitation: 25 mA</td>
</tr>
<tr>
<td></td>
<td>Internal resistance: 641 Ω</td>
<td>Internal resistance: 697 Ω</td>
<td>Internal resistance: 269 Ω</td>
<td>Internal resistance: 641 Ω</td>
</tr>
<tr>
<td></td>
<td>With line fault transparency</td>
<td>With line fault transparency</td>
<td>With line fault transparency</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and additional error message</td>
<td>and additional error message</td>
<td>and additional error message</td>
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</tr>
<tr>
<td></td>
<td>output</td>
<td>output</td>
<td>output</td>
<td></td>
</tr>
</tbody>
</table>

**Configuration:**
- DIP switch
- software
- HART-transparent
- Fault signaling: LED
- Fault monitoring: OC / SC
- Termination Carrier (optional)

 Versions can also be ordered configured ex works. OC = open circuit, SC = short circuit, OV = over-range, UN = under-range, DE = device error
**Signal conditioners with functional safety and explosion protection**

<table>
<thead>
<tr>
<th>Designation</th>
<th>MACX MCR-EX-SL-SD-21-40-LP-SP</th>
<th>MACX MCR-EX-SL-SD-24-48-LP-SP</th>
<th>MACX MCR-EX-SL-SD-21-60-LP-SP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Digital OUT</strong></td>
<td>Solenoid driver, loop-powered, current limitation at 40 mA, output [Ex ia]</td>
<td>Solenoid driver, loop-powered, current limitation at 48 mA, output [Ex ia]</td>
<td>Solenoid driver, loop-powered, current limitation at 58 mA, output [Ex ia]</td>
</tr>
<tr>
<td><strong>Connection</strong></td>
<td>Push-in</td>
<td>Screw</td>
<td>Push-in</td>
</tr>
<tr>
<td><strong>Order No.</strong></td>
<td>2924139</td>
<td>2865764</td>
<td>2924126</td>
</tr>
<tr>
<td><strong>Ex</strong></td>
<td>Ex n, Ex i</td>
<td>Ex n, Ex i</td>
<td>Ex n, Ex i</td>
</tr>
<tr>
<td><strong>SIL</strong></td>
<td>SIL 3</td>
<td>SIL 3</td>
<td>SIL 3</td>
</tr>
<tr>
<td><strong>PL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Overall width in mm</strong></td>
<td>12.5</td>
<td>12.5</td>
<td>12.5</td>
</tr>
<tr>
<td><strong>IN</strong></td>
<td>20 … 30 V DC, (65 mA at Ue = 24 V DC)</td>
<td>20 … 30 V DC, (75 mA at Ue = 24 V DC)</td>
<td>20 … 30 V DC, (95 mA at Ue = 24 V DC)</td>
</tr>
<tr>
<td><strong>OUT</strong></td>
<td>10 V DC (at 40 mA) Current limitation: 40 mA Off-load voltage: 21.9 V DC Internal resistance: 287 Ω</td>
<td>10.5 V DC (at 48 mA) Current limitation: 48 mA Off-load voltage: 24 V DC Internal resistance: 276 Ω</td>
<td>12.9 V DC (at 58 mA) Current limitation: 58 mA Off-load voltage: 21.9 V DC Internal resistance: 133 Ω</td>
</tr>
<tr>
<td><strong>Configuration:</strong></td>
<td>DIP switch</td>
<td>software</td>
<td></td>
</tr>
<tr>
<td><strong>HART-transparent</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>Fault signaling:</strong></td>
<td>LED</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fault monitoring:</strong></td>
<td>OC / SC</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Termination Carrier (optional)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The module can be snapped onto the DIN rail connector for 24 V voltage bridging

Wide-range input for worldwide power supply networks
## Process indicators and field devices

<table>
<thead>
<tr>
<th><strong>Multifunctional process indicators</strong></th>
<th><strong>Web code:</strong> #1140</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Designation</strong></th>
<th><strong>Multifunctional process indicator in control panel component housing, wide-range supply, W x H x D: 96 x 48 x 151.8 mm</strong></th>
<th><strong>Multifunctional Ex i process indicator in control panel component housing, wide-range supply, W x H x D: 96 x 48 x 175 mm</strong></th>
<th><strong>Multifunctional process indicator in field housing, wide-range supply, W x H x D: 199 x 160 x 96 mm</strong></th>
<th><strong>Multifunctional Ex i process indicator in field housing, wide-range supply, W x H x D: 199 x 160 x 96 mm</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Connection</strong></td>
<td>Push-in Screw Push-in Screw Push-in Screw Push-in Screw</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Order No.</strong></td>
<td>2907064 2907216 2907780 2907781</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ex</strong></td>
<td>Ex i</td>
<td>Ex i</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SIL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### IN
- **Current input:**
  - 0 ... 20 mA, 0 ... 5 mA, 4 ... 20 mA
- **Repeater power supply operation:**
  - >16 V, 22 mA
- **Voltage input:**
  - -30 ... 30 V, -10 ... 10 V, -1 ... 1 V, -100 ... 100 mV, 0 ... 1 V, 0 ... 10 V, 1 ... 5 V, 2 ... 10 V
- **RTD:** Pt100, Pt500, Pt1000, Ni100, Ni500, Ni1000, Cu50, Cu100
- **TC:** type B ... E, J, K, N, S, T, L, U

### OUT
- **Analog:**
  - 0 ... 20 mA, 4 ... 20 mA, 0 ... 10 V, 2 ... 10 V, 0 ... 5 V, 1 ... 5 V
- **Digital:**
  - 2 PDT relays
  - 1 transistor output, active
- **Display:** 7-segment LCD, backlit with dot matrix for text / bar graph

### Configuration:
- **keypad:**
  - ••••
- **software / app:**
  - ••••
- **HART:**
  - ••

### DIN rail mounting
- With accessories
- With accessories

### Field installation
- •

### Control panel installation
- •

*) Versions can also be ordered configured ex works. OC = open circuit, SC = short circuit, OV = over-range, UN = under-range, DE = device error
# Process indicators and field devices

<table>
<thead>
<tr>
<th>LED indicators</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Field Analog" /></td>
<td><img src="image" alt="Field Analog" /></td>
</tr>
</tbody>
</table>

**Designation** | **FA MCR-DS-I-I-OLP** | **FA MCR-EX-DS-I-I-OLP** | **FA MCR-FDS-I-I-OLP** | **FA MCR-EX-FDS-I-I-OLP** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Designation</strong></td>
<td>Output loop-powered process indicator in control panel housing, HART-compatible (master), W x H x D: 96 x 48 x 41.5 mm</td>
<td>Output loop-powered Ex i process indicator in control panel housing, HART-compatible (master), W x H x D: 96 x 48 x 41.5 mm</td>
<td>Output loop-powered process indicator in field housing, HART-compatible (master), W x H x D: 133 x 81.5 x 55.5 mm</td>
<td>Output loop-powered Ex i process indicator in field housing, HART-compatible (master), W x H x D: 133 x 81.5 x 55.5 mm</td>
</tr>
<tr>
<td><strong>Connection</strong></td>
<td>Push-in</td>
<td>Screw</td>
<td>Push-in</td>
<td>Screw</td>
</tr>
<tr>
<td><strong>Order No.</strong></td>
<td>2908781</td>
<td>2908800</td>
<td>2908782</td>
<td>2908801</td>
</tr>
<tr>
<td><strong>Ex</strong></td>
<td>Ex i</td>
<td>Ex i</td>
<td>Ex i</td>
<td>Ex i</td>
</tr>
<tr>
<td><strong>SIL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**IN**

4 … 20 mA, 20 … 4 mA

**OUT**

Analog: 4 … 20 mA, 20 … 4 mA

**Display:**

5-digit measured value indicator with dimensions, bar graph, and backlight

| Configuration: keypad | | | | |
|-----------------------|---|---|---|
| | | | |

| Configuration: software / app | | | | |
|-----------------------------|---|---|---|
| | | | |

| Configuration: HART | | | | |
|--------------------|---|---|---|
| | | | |

<table>
<thead>
<tr>
<th>DIN rail mounting</th>
<th>With accessories</th>
<th>With accessories</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Field installation</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control panel installation</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The module can be snapped onto the DIN rail connector for 24 V voltage bridging

Wide-range input for worldwide power supply networks
## Process indicators and field devices

<table>
<thead>
<tr>
<th>LED indicators</th>
<th>Web code: #1140</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image.png" alt="Image of LED indicators" /></td>
<td><img src="image.png" alt="Image of LED indicators" /></td>
</tr>
</tbody>
</table>

### Field Analog

<table>
<thead>
<tr>
<th>Designation</th>
<th>MCR-SL-D-U-I</th>
<th>MCR-SL-D-FIT</th>
<th>MCR-SL-D-SPA-UI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Process indicator for measuring and displaying standard signals, W x H x D: 48 x 24 x 68 mm</td>
<td>Process indicator for measuring and displaying frequencies, pulses, and times, W x H x D: 48 x 24 x 68 mm</td>
<td>Digital setpoint adjuster for defining current and voltage signals, W x H x D: 48 x 24 x 68 mm</td>
</tr>
</tbody>
</table>

### Special functions

<table>
<thead>
<tr>
<th>Connection</th>
<th>Push-in</th>
<th>Screw</th>
<th>Push-in</th>
<th>Screw</th>
<th>Push-in</th>
<th>Screw</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order No.</strong></td>
<td>2864011</td>
<td></td>
<td>2864024</td>
<td></td>
<td>2710314</td>
<td></td>
</tr>
</tbody>
</table>

### Ex

<table>
<thead>
<tr>
<th>SIL</th>
</tr>
</thead>
</table>

### IN

- Current input: 0 … 20 mA, 4 … 20 mA
- Voltage input: 0 … 10 V, 2 … 10 V

### OUT

- 5-digit 7-segment display, LED
- Minimum / maximum value storage

### Configuration: keypad

- *

### Configuration: software/app

- *

### Configuration: HART

- *

### DIN rail mounting

- With accessories

### Field installation

- *

### Control panel installation

- *

* Versions can also be ordered configured ex works. OC = open circuit, SC = short circuit, OV = over-range, UN = under-range, DE = device error
# Head-mounted transducers/2-conductor field devices

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Special functions</td>
<td>Output loop-powered head-mounted temperature transducer for RTDs, TCs, resistance-type sensors, and voltage sensors</td>
<td>Output loop-powered Ex i head-mounted temperature transducer for RTDs, TCs, resistance-type sensors, and voltage sensors</td>
<td>Output loop-powered Ex i head-mounted temperature transducer for RTDs, TCs, resistance-type sensors, and voltage sensors</td>
<td>Output loop-powered head-mounted temperature transducer for RTDs, TCs, resistance-type sensors, and voltage sensors</td>
</tr>
<tr>
<td><strong>Connection</strong></td>
<td>Push-in</td>
<td>Screw</td>
<td>Push-in</td>
<td>Screw</td>
</tr>
<tr>
<td><strong>Order No.</strong></td>
<td>2908742</td>
<td>2908743</td>
<td>2864545</td>
<td>2864529</td>
</tr>
<tr>
<td><strong>Ex</strong></td>
<td>Ex n</td>
<td>Ex i</td>
<td>Ex i</td>
<td>Ex i</td>
</tr>
<tr>
<td><strong>SIL</strong></td>
<td>SIL 2</td>
<td>SIL 2</td>
<td>SIL 2</td>
<td>SIL 2</td>
</tr>
<tr>
<td><strong>IN</strong></td>
<td>RTD: Pt, Ni, Cu, OIML / GOST, Cu50 OIML / GOST</td>
<td>RTD: Pt, Ni, Cu, OIML / GOST, Cu50 OIML / GOST</td>
<td>RTD: Pt100, Pt500, Pt1000, Ni100, Ni500, Ni1000, Cu50, Cu100</td>
<td>RTD: Pt100, Pt500, Pt1000, Ni100, Ni500, Ni1000, Cu50, Cu100</td>
</tr>
<tr>
<td></td>
<td>Resistance range: 10 ... 2000 Ω (minimum measuring span: 10 Ω)</td>
<td>Resistance range: 10 ... 2000 Ω (minimum measuring span: 10 Ω)</td>
<td>Resistance range: 10 ... 400 Ω / 10 ... 2000 Ω (minimum measuring span: 10 Ω / 100 Ω)</td>
<td>Resistance range: 10 ... 400 Ω / 10 ... 2000 Ω (minimum measuring span: 10 Ω / 100 Ω)</td>
</tr>
<tr>
<td></td>
<td>Voltage input: -20 ... 100 mV</td>
<td>Voltage input: -10 ... 100 mV</td>
<td>Voltage input: -10 ... 100 mV</td>
<td>Voltage input: -20 ... 75 mV</td>
</tr>
<tr>
<td><strong>OUT</strong></td>
<td>4 ... 20 mA, 20 ... 4 mA</td>
<td>4 ... 20 mA, 20 ... 4 mA</td>
<td>4 ... 20 mA, 20 ... 4 mA</td>
<td>4 ... 20 mA, 20 ... 4 mA</td>
</tr>
<tr>
<td><strong>Configuration:</strong></td>
<td>keypad</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>software / app</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HART</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DIN rail mounting</strong></td>
<td>With accessories</td>
<td>With accessories</td>
<td>With accessories</td>
<td>With accessories</td>
</tr>
<tr>
<td><strong>Field installation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Control panel installation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Process indicators and field devices

<table>
<thead>
<tr>
<th><strong>Head-mounted transducers/2-conductor field devices</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Field Analog" /></td>
<td><img src="image" alt="Power Symbol" /></td>
</tr>
</tbody>
</table>

## Designation
- **MCR-FL-HT-TI-EX**
- **MCR-SL-HT-PT100-I**
- **MACX MCR-TS-I-OLP**
- **MACX MCR-EX-TS-I-OLP**

### Special functions
- Output loop-powered
- **Ex i** head-mounted temperature transducer for RTDs, TCs, resistance-type sensors, and voltage sensors
- Output loop-powered head-mounted temperature transducer for Pt100 resistance temperature detector
- Output loop-powered temperature transducer for RTDs, TCs; HART-compatible
- Output loop-powered **Ex i** temperature transducer for RTDs, TCs; HART-compatible

### Connection
- **Push-in**
- **Screw**

### Order No.
- 2864532
- 2864516
- 2908664
- 2908662
- 2908661
- 2908660

### Ex
- **Ex i**
- **Ex n**
- **Ex i**

### SIL

### IN
- **RTD**: Pt100, Pt500, Pt1000, Ni100, Ni500, Ni1000, Cu50, Cu100
- **TC**: type B, E, J, K, N, S, T, L, U
- Resistance range: 10...2000 Ω (minimum measuring span: 10 Ω)
- Voltage input: -20...75 mV

### OUT
- 4...20 mA, 20...4 mA

### Configuration:
- **keypad**
- **software/app**
- **HART**
- **With accessories**
- **With accessories**
- **With accessories**
- **With accessories**

### *) Versions can also be ordered configured ex works. OC = open circuit, SC = short circuit, OV = over-range, UN = under-range, DE = device error

---

40  **PHOENIX CONTACT**
# Field Analog process indicators and field devices

<table>
<thead>
<tr>
<th>Head-mounted transducers/2-conductor field devices</th>
<th>Web code: #1140</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Field Analog" /></td>
<td><img src="image" alt="Web Code" /></td>
</tr>
</tbody>
</table>

### Designation

<table>
<thead>
<tr>
<th>Designation</th>
<th>MCR-FL-TS-LP-I-EX</th>
<th>MCR-SL-PT100-LP-I</th>
<th>MCR-FL-TLP-I</th>
<th>MCR-FL-TLP-I-EX</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Logos for wide range, DIN rail connector</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order No.</td>
<td>2864587</td>
<td>2864558</td>
<td>2864561</td>
<td>2864574</td>
</tr>
<tr>
<td>Ex</td>
<td>Ex i</td>
<td></td>
<td></td>
<td>Ex i</td>
</tr>
<tr>
<td>SIL</td>
<td>SIL 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### IN

<table>
<thead>
<tr>
<th>IN</th>
<th>RTD: Pt100, Pt500, Pt1000, Ni100, Ni500, Ni1000, Cu50, Cu100</th>
<th>TC: type B…E, J, K, N, S, T, L, U</th>
</tr>
</thead>
</table>

**RTD:** Pt100 (minimum measuring span: 10 K)

**Resistance range:** 10 ... 400 Ω / 10 ... 2000 Ω (minimum measuring span: 10 Ω / 100 Ω)

**Voltage input:** -10 ... 100 mV

### OUT

<table>
<thead>
<tr>
<th>OUT</th>
<th>4...20 mA, 20...4 mA</th>
<th>4...20 mA, 20...4 mA</th>
<th>4...20 mA, 20...4 mA</th>
<th>4...20 mA, 20...4 mA</th>
</tr>
</thead>
</table>

### Configuration:

- Keypad
- Software/app
- HART

### DIN rail mounting

- **Ex**: Ex i
- **SIL**: SIL 2

### Control panel installation

- **Wide-range input for worldwide power supply networks**
- **24 V voltage bridging**

---

The module can be snapped onto the DIN rail connector for 24 V voltage bridging.

![The module can be snapped onto the DIN rail connector for 24 V voltage bridging](image)

PHOENIX CONTACT 41
Product overview – Gateways for bus and network connection

Modbus/RTU gateway
**MINI MCR-2-V8-MOD-RTU**
Order No.: 2905634
Gateway for integrating any eight MINI Analog Pro signal conditioners with current or digital output into a Modbus/RTU network

Modbus/TCP gateway
**MINI MCR-2-V8-MOD-TCP**
Order No.: 2905635
Gateway for integrating any eight MINI Analog Pro signal conditioners with current or digital output into a Modbus/RTU network

PROFIBUS gateway
**MINI MCR-2-V8-PB-DP**
Order No.: 2905636
Gateway for integrating any eight MINI Analog Pro signal conditioners with current or digital output into a PROFIBUS DP network

Accessories for the MINI Analog Pro highly compact signal conditioners

DIN rail connectors
**ME 6,2 TBUS-2 1,5/5-ST-3,81 GY**
Order No.: 2695439
Gray, for two MINI Analog Pro modules each

**ME 17,5 TBUS 1,5/5-ST-3,81 GN**
Order No.: 2709561
Green, for MINI-SYS system power supply (2 required)

Power supply
**MINI-SYS-PS-100-240AC/24DC/1.5**
Order No.: 2866983

**MINI-PS-100-240AC/24DC/1.5/EX**
Order No.: 2866653 (Ex-n-capable)
- Wide-range input: 85 ... 264 V AC (45 - 65 Hz)
- Output voltage: 24 V DC ±1%
- Output current: 1.5 A at 60°C / 2 A at 40°C

Programming adapters
**IFS-USB-PROG-ADAPTER**
Order No.: 2811271
USB programming adapter for programming via PC

**IFS-BT-PROG-ADAPTER**
Order No.: 2905872
Programming adapter for wireless communication via Bluetooth

**TWN4 MIFARE NFC USB ADAPTER**
Order No.: 2909681
NFC programming adapter with USB interface, for the wireless configuration of NFC-capable products
Accessories for the MINI Analog Pro highly compact signal conditioners

Marking labels

UCT-EM (30x5) Order No.: 0801505
UCT-EM (30x5) CUS Order No.: 0801589
UCT-EM (30x5) YE Order No.: 0830340
UC-EMLP (15x5) Order No.: 0819301
UC-EMLP (15x5) CUS Order No.: 0824550

- For snapping in or attaching to module cover
- Can be marked with THERMOMARK CARD or BLUEMARK printer
- Lettering field size: 30 x 5 mm/15 x 5 mm

Adhesive labels

SK 5,0 WH:REEL Order No.: 0805221
- Self-adhesive marker strips, unmarked, continuous
- Material off the roll for marking with THERMOMARK ROLL thermal transfer printer

Connector set

FASTCON PRO-SET
Order No.: 2906227
Set, consisting of four plugs with screw connection

FASTCON PRO-SET-PT
Order No.: 2906228
Set, consisting of four plugs with Push-in connection

System cabling

MINI MCR-2-V8-FLK 16
Order No.: 2901993
System adapter for fast and error-free connection of any eight MINI Analog Pro signal conditioners to a controller

TC-D37SUB-ADIO16-MP-P-UNI
Order No.: 2906639
Termination Carrier, universal, for 16 MINI Analog Pro signal conditioners

TC-D37SUB-AIO16-MP-PS-UNI
Order No.: 2906640
Termination Carrier, universal, for 16 MINI Analog Pro signal conditioners, with HART multiplexer connection

Setpoint adjuster

EMG 30-SP-4K7LIN
Order No.: 2940252
Individual setpoint definition, resistance value 4.7 kΩ

EMG 30-SP-10K LIN
Order No.: 2942124
Individual setpoint definition, resistance value 10 kΩ

EMG 30-SPK-10K LIN
Order No.: 2942137
With preset set points, resistance value 10 kΩ
Accessories for the MACX Analog signal conditioners

**Programming adapters**

**IFS-USB-PROG-ADAPTER**
Order No.: 2811271
For programming multifunctional devices with the ANALOG-CONF software or via FDT/DTM

**IFS-BT-PROG-ADAPTER**
Order No.: 2905872
Programming adapter for wireless communication via Bluetooth

**DIN rail connectors**

**ME 6,2 TBUS-2 1,5/ST-3,81 GY**
Order No.: 2695439

**ME 6,2 TBUS-2 1,5/ST-3,81 GN**
Order No.: 2869728
For direct supply via any MACX Analog device or for supply via a feed-in and fault signaling module of the same shape

**Marking material**

**UC-EMLP (11X9) (white)**
Order No.: 0819291
Self-adhesive plastic labels for equipment marking: UniCard, 10-section, lettering field size: 11 x 9 mm

**UC-EMLP (11X9) CUS (white)**
Order No.: 0824547
As above, plus marked according to your specifications
For details, visit phoenixcontact.com

**Test plugs**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Color</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPS-MT</td>
<td></td>
<td>0201744</td>
</tr>
<tr>
<td>MPS-IH BK</td>
<td>black</td>
<td>0201731</td>
</tr>
<tr>
<td>MPS-IH GY</td>
<td>gray</td>
<td>0201728</td>
</tr>
<tr>
<td>MPS-IH GN</td>
<td>green</td>
<td>0201702</td>
</tr>
<tr>
<td>MPS-IH YE</td>
<td>yellow</td>
<td>0201692</td>
</tr>
<tr>
<td>MPS-IH BU</td>
<td>blue</td>
<td>0201689</td>
</tr>
<tr>
<td>MPS-IH RD</td>
<td>red</td>
<td>0201676</td>
</tr>
<tr>
<td>MPS-IH WH</td>
<td>white</td>
<td>0201663</td>
</tr>
</tbody>
</table>

Test plug for 2.3 mm Ø socket hole, consisting of MPS-MT metal part and MPS-IH… color insulating sleeve

**Function plugs**

**MACX MCR-CJC**
Order No.: 2924993
Plug for cold junction compensation for thermocouples, in combination with MACX…-(EX)-T-UI… temperature transducers

**MACX MCR-EX-CJC**
Order No.: 2925002

**MACX MCR-I20**
Order No.: 2905680

**MACX MCR-EX-I20**
Order No.: 2905679
Connection terminal block for current signals (±20 mA) for safe switching of limit values, in combination with MACX…-(EX)-T-UI… temperature transducers

**Multiplexer for HART signals**

**MACX MCR-S-MUX**
Order No.: 2865599
Multiplexer for the digital connection of HART-compatible field devices to a PC or management system, 32-channel, including two 14-wire flat-ribbon cables

**MACX MCR-S-MUX-TB**
Order No.: 2308124
Transfer board for connecting HART field devices to the HART multiplexer
Accessories for the MACX Analog signal conditioners

**Shield fast connection**
- **SSA 3-6 (Ø 3 - 6 mm)**
  - Order No.: 2839295
- **SSA 5-10 (Ø 5 - 10 mm)**
  - Order No.: 2839512
  - For connecting cable shielding to cable terminal points, can be connected to PLUGTRAB PT

**Resistance circuit**
- **UKK 5-2R/NAMUR**
  - Order No.: 2941662
- **D-UKK 3/5 (gray)**
  - Order No.: 2770024
- **D-UKK 3/5 BU (blue)**
  - Order No.: 2770105
  - Double-level terminal block with resistance circuit in accordance with NAMUR for line fault detection with mechanical contacts. Important: for intrinsically safe circuits, only in combination with D-UKK 3/5… cover

**Termination Carriers**
- **TC-D37SUB-ADIO16-EX-P-UNI**
  - Order No.: 2924854
  - Universal, for 16 single-channel MACX signal conditioners
- **TC-D37SUB-AIO16-EX-PS-UNI**
  - Order No.: 2902932
  - Universal, for 16 single-channel MACX signal conditioners, with HART multiplexer connection
- **TC-2D37SUB-ADIO32-2EX-P-UNI**
  - Order No.: 2904684
  - Universal, for 16 two-channel MACX signal conditioners

**Feed-in and fault signaling module**
- **MACX MCR-PTB**
  - Order No.: 2865625
  - With screw connection
- **MACX MCR-PTB-SP**
  - Order No.: 2924184
  - With Push-in connection
- **TC-MACX-MCR-PTB**
  - Order No.: 2904673
  - Only for use on the Termination Carrier, with screw connection

**Dummy module with no electrical function**
- **MACX MCR-EX-DUMMY-ISOLATOR**
  - Order No.: 2904970
  - With screw
- **MACX MCR-EX-DUMMY-ISOLATOR-SP**
  - Order No.: 2905846
  - With Push-in connection
Accessories for the Field Analog process indicators and field devices

Programming adapters

**MCR-PAC-T-USB**
Order No.: 2309000
Software adapter cable, length: 2.4 m, for programming MCR-...-LP-... and MCR-...-HT-... modules

GW HART USB MODEM
Order No.: 1032996
HART USB modem for configuring MACX MCR(-EX)-TS-I-OLP-... and FA MCR(-EX)-HT-TS-I-OLP-... via the HART protocol

DIN rail adapters

**FA MCR-SL-D-RM**
Order No.: 1032996
DIN rail adapter for FA MCR-... digital indicators with 96 x 48 mm housing dimensions, suitable for 35 mm DIN rails in accordance with EN 60715

**MCR-SL-D-RA**
Order No.: 2810081
DIN rail adapter for LED indicators with 24 x 48 mm housing dimensions, suitable for 35 mm DIN rails in accordance with EN 60715

Wall and tube mounting sets

**FA MCR-FD-PM**
Order No.: 2908739
Wall and tube mounting set for FA MCR-FD-TUI-U1-2REL-UP and FA MCR-EX-FD-TUI-U1-2REL-UP process indicators

**FA MCR-FDS-PM**
Order No.: 2908783
Wall and tube mounting set for FA MCR(-EX)-FDS-I-I-OLP process indicator in field housing

Display for head transmitter

**FA MCR-HT-D**
Order No.: 2908735
Display unit for plugging into FA MCR-... head transmitters, enables process values to be read directly, can be configured separately via DIP switch

Electronics housings

**FA MCR-HT-FH**
Order No.: 2908736
Field housing for the installation of head transmitters with or without display unit, for direct connection to the process

**FA MCR-HT-FH-WM**
Order No.: 2908737
Wall fastening for FA MCR-HT-FH field housing
Power supply and diagnostics

Flexible feed-in
The DIN rail connector gives you three device supply options:

1. Direct feed-in on the module
   • Without additional accessories
   • For up to 16\(^1\) MINI Analog Pro modules
   • For up to 32\(^1\) MACX modules
2. Feed-in via a feed-in module of the same shape
   • Also allows redundant feed-in and supply monitoring
   • For up to 115\(^1\) MINI Analog Pro modules
   • For up to 80\(^1\) MACX modules
3. Feed-in via the system power supply
   • Also allows redundant feed-in and supply monitoring
   • For up to 60\(^1\) MINI Analog Pro modules
   • For up to 10\(^1\) MACX modules
   Note: not suitable for Ex i modules

Convenient diagnostics with fault monitoring
With fault monitoring group error messaging, the DIN rail connector offers a modular solution for fast error evaluation in multi-channel applications. The MINI Analog Pro and MACX systems are compatible with one another. The following faults are indicated depending on the module type:

• Open circuit
• Short circuit
• Supply failure
• Over-range or under-range (MINI Analog Pro only)
• Fuse fault on the feed-in module (MACX Analog only)

\(^1\) The exact number depends on the current consumption of the module type in question. Notes on calculation can be found in our feed-in manual in the download area for the product.
Isolate, convert, filter, amplify – Application examples

Flow monitoring and signaling using a 4-way signal conditioner
The freely adjustable 4-way signal conditioner with switching output enables you to set the parameters for your application according to your specific requirements. The transistor output is available as a threshold switch. You can configure eight different switching behaviors.

Flow monitoring using a 3-way signal conditioner
The 3-way signal conditioners with fixed values represent a price-optimized alternative in multi-channel standard applications.

Level monitoring using a repeater power supply
The repeater power supply supplies the transmitter located in the field and electrically isolates the input signal from the output signal. The device can be used in both isolator and repeater power supply operation.
Isolate, convert, filter, amplify – Application examples

**Pressure monitoring using a passive isolator**
Since the output-loop-powered isolator is supplied via the current loop of an active analog input module, no additional auxiliary power is required. On the input side, you can connect analog signals from 2 mA to 40 mA or from 50 mV to 30 V.

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**Temperature measurement using a resistance temperature detector with temperature transducer**
The freely adjustable temperature transducer enables you to connect resistance temperature detectors and remote resistance-type sensors with 2-, 3-, and 4-conductor connection technology. The individual measured temperature values are converted into a linear and freely adjustable current or voltage signal.

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**Temperature measurement using a thermocouple with temperature transducer**
The freely adjustable temperature transducer enables you to connect various thermocouples. The individual measured temperature values are converted into a linear and freely adjustable current or voltage signal.
Isolate, convert, filter, amplify – Application examples

**Potentiometer measurement using a measuring transducer**
The configurable potiposition transducer with automatic potentiometer detection is used to connect potentiometers from 0 ... 100 Ω to 0 ... 100 kΩ. The individual position values are converted into a linear and freely adjustable current or voltage signal.

**Level monitoring using a limit value switch**
The limit value switch enables you to record and monitor analog signals from 0 ... 24 mA or from 0 ... 12 V. The PDT relay at the output switches loads of up to 250 V AC/DC and max. 6 A.

**Level measurement in the Ex area using an Ex i repeater power supply**
The repeater power supply and input signal conditioner is designed for the operation of intrinsically safe 2-, 3- or 4-conductor measuring transducers and mA sources installed in the Ex area. The analog measured value is electrically isolated and transmitted 1:1 from the Ex area to the non-Ex area. You can operate the output of the module actively or passively.
Temperature measurement in the Ex area using an Ex i temperature transducer

The programmable Ex i temperature transducer is designed for the intrinsically safe operation of resistance temperature detectors and remote resistance-type sensors installed in the Ex area. The measured values are converted into a linear 0/4 ... 20 mA signal to drive a non-intrinsically safe load.

Proximity sensor detection in the Ex area using an Ex i NAMUR signal conditioner

With the 2-channel NAMUR signal conditioner, you can operate proximity sensors installed in the Ex area as well as unconnected contacts or contacts with resistance circuit. One changeover contact is available per channel as a signal output.

Controlling a regulating valve in the Ex area using an output signal conditioner

The solenoid drivers are designed for the intrinsically safe control of Ex i solenoid valves, alarm transmitters, and indicators installed in the Ex area. The input uses low/high signal logic. The various output characteristic curves are compatible with market-standard solenoid valves.
Discover more products for MCR technology from Phoenix Contact

Discover more products that can be combined with our products for measurement and control technology.

Shielded sensor/actuator cabling
Ensure error-free transmission of your analog signals, even in environments with high electromagnetic interference, with a complete range of products and solutions for shielded signal transmission of sensors and actuators.
System cabling for easy signal routing
Reliable signal transmission: the universal termination boards couple connectors to screw, Push-in or spring-cage terminal blocks 1:1 – for IDC/FLK, D-SUB, ELCO, DIN rail or RJ45. Universal cables enable fast wiring that is protected against polarity reversal.

Surge protection for MCR technology
A large number of sensors and actuators are monitored and controlled in applications for measurement and control technology. A failure due to overvoltages can have devastating effects. Our surge protective devices offer an ideal solution and help to avoid system failures for all applications.

Connection technology for marshaling
Marshaling patchboards and marshaling terminals are used to marshal signals in automation applications in a clearly arranged manner. The products ensure space-saving, clear, and error-free wiring. The disconnect and knife disconnect terminal blocks enable you to localize malfunctions quickly and easily, and perform off-load maintenance.
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 the need for tools. The broad, technologically leading product portfolio will always provide you with the right product for standard or special applications.

### 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.

### 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.

### 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.

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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

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