

# MACX MCR-EX-SL-NAM-YO-SP - Isolation amplifier



2905724

<https://www.phoenixcontact.com/pc/products/2905724>

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Ex i NAMUR signal conditioners. For operating Ex i proximity sensors and switches in hazardous areas. Passive transistor output (resistive, Yokogawa-compatible), line fault transparency, up to SIL 2 according to IEC 61508; Push-in connection

## Your advantages

- Signal input: intrinsically safe [Ex ia]; for NAMUR proximity sensors (EN 60947-5-6) or switch contacts
- Signal output with resistive behavior (transistor), compatible with Yokogawa ProSafe DI card SDV 144
- Signal output with line fault transparency, line fault indication directly via the signal output
- Up to 5 kHz switching frequency
- Direction of operation can be selected
- Line fault detection (LFD) can be enabled and disabled
- SIL 2 according to IEC/EN 61508
- 3-way electrical isolation
- Power supply and error indication possible via DIN rail connector
- Plug-in connection terminals, push-in connection technology
- Installation in zone 2 permitted
- Housing width: 12.5 mm

## Commercial data

|                                      |                     |
|--------------------------------------|---------------------|
| Item number                          | 2905724             |
| Packing unit                         | 1 pc                |
| Minimum order quantity               | 1 pc                |
| Product key                          | CK3141              |
| Catalog page                         | Page 160 (C-5-2019) |
| GTIN                                 | 4046356992374       |
| Weight per piece (including packing) | 167 g               |
| Weight per piece (excluding packing) | 147.6 g             |
| Customs tariff number                | 85365019            |
| Country of origin                    | DE                  |

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## Technical data

### Product properties

|                 |   |
|-----------------|---|
| Product type    | Isolating switch transf.                            |
| Product family  | MACX Analog   |
| No. of channels | 1   |
| Type            | Ex i signal conditioners with SIL functional safety |
| Configuration   | DIP switches  |

Insulation characteristics: GB Standard

|                      |    |
|----------------------|----|
| Overvoltage category | II |
| Pollution degree     | 2  |

### System properties

Functionality

|               |              |
|---------------|--------------|
| Configuration | DIP switches |
|---------------|--------------|

### Electrical properties

|   |                 |
|---|-----------------|
| No. of channels                               | 1               |
| Electrical isolation                          | 3-way isolation |
| Electrical isolation between input and output | yes             |

Electrical isolation Input/output

|                      |   |
|----------------------|---|
| Electrical isolation | 375 V (Peak value in accordance with IEC/EN 60079-11) |
|----------------------|---|

Electrical isolation Input/output/supply, DIN rail connector

|                          |  |
|--------------------------|--|
| Rated insulation voltage | 300 V <sub>rms</sub>                             |
| Test voltage             | 2.5 kV AC (50 Hz, 60 s)                          |
| Insulation               | Safe isolation in accordance with IEC/EN 61010-1 |

Electrical isolation Input/supply, DIN rail connector

|                      |   |
|----------------------|---|
| Electrical isolation | 375 V (Peak value in accordance with IEC/EN 60079-11) |
|----------------------|---|

Supported controller YOKOGAWA ProSafe-RS

|                   |        |
|-------------------|--------|
| Suitable I/O card | SDV144 |
|-------------------|--------|

Supply

|                        |  |
|------------------------|--|
| Nominal supply voltage | 24 V DC  |
| Supply voltage range   | 9.6 V DC ... 30 V DC (12 V DC ... 24 V DC (-20 % ... +25 %)) |
| Power dissipation      | < 0.6 W  |
| Power consumption      | < 600 mW   |

### Input data

Signal: NAMUR

|                          |                    |
|--------------------------|--------------------|
| Description of the input | Intrinsically safe |
|--------------------------|--------------------|

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|   |  |
|---|--|
| Number of inputs                        | 1  |
| Available input sources                 | NAMUR proximity sensors (IEC/EN 60947-5-6) |
|   | Floating switch contacts                   |
|   | Switch contacts with resistance circuit    |
| Switching threshold "0" signal current  | < 1.2 mA (blocking)                        |
| Switching threshold "1" signal, current | > 2.1 mA (conductive)                      |
| Switching hysteresis                    | < 0.2 mA                                   |
| Line fault detection                    | < 0.05 mA ... 0.35 mA (Line break)         |
|   | < 100 Ω ... 360 Ω (Short circuit)          |
|   | Activated /deactivated via DIP switch      |
| Non-load voltage                        | 8 V DC                                     |

## Output data

### Signal

|                   |   |
|-------------------|---|
| Number of outputs | 1 |
|-------------------|---|

## Connection data

|                                  |   |
|----------------------------------|---|
| Connection method                | Push-in connection                          |
| Stripping length                 | 8 mm  |
| Conductor cross section rigid    | 0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |
| Conductor cross section flexible | 0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> |
| Conductor cross section AWG      | 24 ... 16                                   |

### Test socket

|               |        |
|---------------|--------|
| Max. diameter | 2.3 mm |
|---------------|--------|

## Ex data

### Safety data

|  |   |
|--|---|
| Max. internal inductance $L_i$   | negligible  |
| Max. internal capacitance $C_i$  | negligible  |
| Max. output voltage $U_o$  | 9.6 V   |
| Max. output current $I_o$  | 10 mA   |
| Max. output power $P_o$  | 25 mW   |
| Safety-related maximum voltage $U_m$   | 253 V AC/DC   |
| I/A (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$        | 1000 mH / 210 μF  |
| I/B/I/C (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$    | 1000 mH / 26 μF   |
| I/C (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$        | 300 mH / 3.6 μF   |
| I/B/I/A/I/C (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$ | 100 mH / 1 μF, 5 mH / 1 μF, 1 mH / 1 μF, 10 μH / 1 μF                         |
| I/C (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$         | 100 mH / 510 nF, 50 mH / 580 nF, 5 mH / 600 nF, 1 mH / 600 nF, 10 μH / 600 nF |

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## Interfaces

### Data

|                 |   |
|-----------------|---|
| No. of channels | 0 |
|-----------------|---|

## Signaling

|                |                              |
|----------------|------------------------------|
| Status display | Green LED (supply voltage)   |
|                | LED yellow (switching state) |
|                | Red LED (line errors)        |

## Dimensions

|                 |  |
|-----------------|--|
| Width           | 12.5 mm  |
| Height          | 116 mm   |
| Depth           | 113.7 mm   |
| Depth NS 35/7,5 | 114.5 mm (Snapped onto DIN rail NS 35/7,5 in accordance with EN 60715) |

## Material specifications

|  |              |
|--|--------------|
| Flammability rating according to UL 94 | V0 (Housing) |
| Housing material                       | PA 6.6-FR    |

## Characteristics

### Safety data

|                              |   |
|------------------------------|---|
| Safety Integrity Level (SIL) | 2 |
|------------------------------|---|

### Safety data

|                              |   |
|------------------------------|---|
| Safety Integrity Level (SIL) | 2 |
|------------------------------|---|

## Environmental and real-life conditions

### Ambient conditions

|   |  |
|---|--|
| Degree of protection                    | IP20 (not assessed by UL)                |
| Ambient temperature (operation)         | -20 °C ... 60 °C (Any mounting position) |
| Ambient temperature (storage/transport) | -40 °C ... 80 °C                         |
| Altitude                                | ≤ 2000 m                                 |
| Permissible humidity (operation)        | 10 % ... 95 % (non-condensing)           |

## Approvals

### CE

|             |              |
|-------------|--------------|
| Certificate | CE-compliant |
| Note        | and EN 61326 |

### ATEX

|                |                            |
|----------------|----------------------------|
| Identification | ⊕ II (1) G [Ex ia Ga] IIC  |
|                | ⊕ II (1) D [Ex ia Da] IIIC |

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|             |                           |
|-------------|---------------------------|
|             | Ⓜ II 3G Ex nA IIC T4 Gc X |
| Certificate | IBExU 12 ATEX 1169        |

## IECEX

|                |                    |
|----------------|--------------------|
| Identification | [Ex ia Ga] IIC     |
|                | [Ex ia Da] IIIC    |
|                | Ex nA IIC T4 Gc    |
| Certificate    | IECEX IBE 12.0018X |

## CCC / China-Ex

|                |                         |
|----------------|-------------------------|
| Identification | [Ex ia Ga] IIC          |
|                | [Ex iaD]                |
|                | Ex nA [ia Ga] IIC T4 Gc |
| Certificate    | NEPSI GYJ20.1314X       |

## UL, USA/Canada

|                |                        |
|----------------|------------------------|
| Identification | UL 61010 Listed        |
| Certificate    | ⓂⓃ.Ⓞ. C.D.-No 83104549 |

## Safety Integrity Level (SIL, IEC 61508)

|                |   |
|----------------|---|
| Identification | 2 |
|----------------|---|

## EAC Ex

|                |                         |
|----------------|-------------------------|
| Identification | ⓂⓃ [Ex ia Ga] IIC       |
|                | ⓂⓃ [Ex ia Da] IIIC      |
| Certificate    | RU C-DE.AB72.B.00093/19 |

## INMETRO

|                |                 |
|----------------|-----------------|
| Identification | [Ex ia Ga] IIC  |
|                | [Ex ia Da] IIIC |
|                | Ex nA IIC T4 Gc |
| Certificate    | DNV 18.0144 X   |

## EMC data

|                               |                                |
|-------------------------------|--------------------------------|
| Noise immunity                | EN 61000-6-2                   |
| Electromagnetic compatibility | Conformance with EMC directive |
| Noise emission                | EN 61000-6-4                   |

## Standards and regulations

|                      |                 |
|----------------------|-----------------|
| Electrical isolation | 3-way isolation |
|----------------------|-----------------|

## GB Standard

|                       |            |
|-----------------------|------------|
| Standards/regulations | GB 3626.20 |
|                       | GB 3836.1  |
|                       | GB 3836.4  |
|                       | GB 3836.8  |
|                       | GB 12476.1 |

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|  |            |
|--|------------|
|  | GB 12476.4 |
|--|------------|

## Mounting

|               |                   |
|---------------|-------------------|
| Mounting type | DIN rail mounting |
|---------------|-------------------|

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## Classifications

### ECLASS

ECLASS-11.0

27210121

### ETIM

ETIM 8.0

EC001485

### UNSPSC

UNSPSC 21.0

39121000

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## Environmental product compliance

|            |  |
|------------|--|
| China RoHS | Environmentally Friendly Use Period = 50 years<br>For information on hazardous substances, refer to the manufacturer's declaration available under "Downloads" |
|------------|--|



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## Accessories

### ME 6,2 TBUS-2 1,5/5-ST-3,81 GY - DIN rail bus connectors

2695439

<https://www.phoenixcontact.com/pc/products/2695439>



DIN rail connector (TBUS), 5-pos., for bridging the supply voltage, can be snapped onto NS 35/... DIN rail in accordance with EN 60715

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### MACX MCR-PTB - Power and error message module

2865625

<https://www.phoenixcontact.com/pc/products/2865625>



Power and fault signaling module with screw connection, including corresponding ME 17,5 TBUS 1,5/ 5-ST-3,81 GY DIN rail connector

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## MACX MCR-PTB-SP - Power and error message module

2924184

<https://www.phoenixcontact.com/pc/products/2924184>



Power and fault signaling module with Push-in connection, including corresponding ME 17,5 TBUS 1,5/ 5-ST-3,81 GY DIN rail connector

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## QUINT4-SYS-PS/1AC/24DC/2.5/SC - Power supply unit

2904614

<https://www.phoenixcontact.com/pc/products/2904614>



Primary-switched power supply, QUINT POWER, screw connection, DIN rail mounting, supply of devices possible via the TBUS DIN rail connector, protective coating, input: single-phase, output: 24 V DC/2.5 A

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<https://www.phoenixcontact.com/pc/products/2905724>

## TC-D37SUB-AIO16-EX-PS-UNI - Module carrier

2902932

<https://www.phoenixcontact.com/pc/products/2902932>



Universal termination carrier for connecting 16 MACX Analog Ex i signal conditioners to digital or analog I/O cards, via D-SUB connector, 37-pos. (1:1 connection), with HART multiplexer connection

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## TC-D37SUB-ADIO16-EX-P-UNI - Module carrier

2924854

<https://www.phoenixcontact.com/pc/products/2924854>



Universal termination carrier for connecting 16 MACX Analog Ex i signal conditioners to digital or analog I/O cards, via D-SUB connector, 37-pos. (1:1 connection)

# MACX MCR-EX-SL-NAM-YO-SP - Isolation amplifier



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## D-UKK 3/5 - End cover

2770024

<https://www.phoenixcontact.com/pc/products/2770024>



End cover, length: 56 mm, width: 2.5 mm, height: 56 mm, color: gray

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## D-UKK 3/5 BU - End cover

2770105

<https://www.phoenixcontact.com/pc/products/2770105>



End cover, length: 56 mm, width: 2.5 mm, height: 56 mm, color: blue

# MACX MCR-EX-SL-NAM-YO-SP - Isolation amplifier

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## UKK 5-2R/NAMUR - Component terminal block

2941662

<https://www.phoenixcontact.com/pc/products/2941662>



Double-level terminal block, with preassembled resistors

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## MPS-IH WH - Insulating sleeve

0201663

<https://www.phoenixcontact.com/pc/products/0201663>



Insulating sleeve, color: white

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## MPS-IH RD - Insulating sleeve

0201676

<https://www.phoenixcontact.com/pc/products/0201676>

Insulating sleeve, color: red



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## MPS-IH BU - Insulating sleeve

0201689

<https://www.phoenixcontact.com/pc/products/0201689>

Insulating sleeve, color: blue



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## MPS-IH YE - Insulating sleeve

0201692

<https://www.phoenixcontact.com/pc/products/0201692>

Insulating sleeve, color: yellow



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## MPS-IH GN - Insulating sleeve

0201702

<https://www.phoenixcontact.com/pc/products/0201702>

Insulating sleeve, color: green



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## MPS-IH GY - Insulating sleeve

0201728

<https://www.phoenixcontact.com/pc/products/0201728>

Insulating sleeve, color: gray



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## MPS-IH BK - Insulating sleeve

0201731

<https://www.phoenixcontact.com/pc/products/0201731>

Insulating sleeve, color: black





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## MPS-MT - Test plugs

0201744

<https://www.phoenixcontact.com/pc/products/0201744>



Test plugs, with solder connection up to 1 mm<sup>2</sup> conductor cross section, number of positions: 1, color: gray

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## UC-EMLP (11X9) - Plastic label

0819291

<https://www.phoenixcontact.com/pc/products/0819291>



Plastic label, Sheet, white, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

# MACX MCR-EX-SL-NAM-YO-SP - Isolation amplifier



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<https://www.phoenixcontact.com/pc/products/2905724>

## UC-EMLP (11X9) YE - Plastic label

0822602

<https://www.phoenixcontact.com/pc/products/0822602>



Plastic label, Sheet, yellow, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

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## UC-EMLP (11X9) CUS - Plastic label

0824547

<https://www.phoenixcontact.com/pc/products/0824547>



Plastic label, can be ordered: by sheet, white, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm

# MACX MCR-EX-SL-NAM-YO-SP - Isolation amplifier



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## UC-EMLP (11X9) YE CUS - Plastic label

0824548

<https://www.phoenixcontact.com/pc/products/0824548>



Plastic label, can be ordered: by sheet, yellow, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm

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## UC-EMLP (11X9) SR - Plastic label

0828094

<https://www.phoenixcontact.com/pc/products/0828094>



Plastic label, Sheet, silver, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, PLOTMARK, CMS-P1-PLOTTER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

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## UC-EMLP (11X9) SR CUS - Plastic label

0828098

<https://www.phoenixcontact.com/pc/products/0828098>



Plastic label, can be ordered: by sheet, silver, labeled according to customer specifications, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 10

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## US-EMLP (11X9) - Plastic label

0828789

<https://www.phoenixcontact.com/pc/products/0828789>



Plastic label, Card, white, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135

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## US-EMLP (11X9) YE - Plastic label

0828871

<https://www.phoenixcontact.com/pc/products/0828871>



Plastic label, Card, yellow, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135

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## US-EMLP (11X9) SR - Plastic label

0828872

<https://www.phoenixcontact.com/pc/products/0828872>



Plastic label, Card, silver, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 135

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## LS-EMLP (11X9) WH - Device marker

0831678

<https://www.phoenixcontact.com/pc/products/0831678>

Device marker, Sheet, white, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255



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## LS-EMLP (11X9) SR - Device marker

0831705

<https://www.phoenixcontact.com/pc/products/0831705>

Device marker, Sheet, silver, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255



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## LS-EMLP (11X9) YE - Device marker

0831732

<https://www.phoenixcontact.com/pc/products/0831732>

Device marker, Sheet, yellow, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: adhesive, lettering field size: 11 x 9 mm, Number of individual labels: 255



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## SZS 0,6X3,5 - Screwdriver

1205053

<https://www.phoenixcontact.com/pc/products/1205053>

Actuation tool, for ST terminal blocks, insulated, also suitable for use as a bladed screwdriver, size: 0.6 x 3.5 x 100 mm, 2-component grip, with non-slip grip



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