

# MACX MCR-EX-IDS-2I-2I - Output signal conditioner



2865421

<https://www.phoenixcontact.com/de/produkte/2865421>

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2-channel Ex i output signal conditioner, HART-transparent. Isolates and transmits 0/4 mA ... 20 mA signals with intrinsic safety to a load in the Ex area. 4-way electrical isolation, line fault detection, SIL 2 (SC3) in accordance with IEC 61508, screw connection.

## Commercial Data

Item number	2865421
Packing unit	1 pc
Minimum order quantity	1 pc
Sales Key	J1 - MSR-Technik
Product Key	CK3112
GTIN	4046356160469
Weight per Piece (including packing)	186,6 g
Weight per Piece (excluding packing)	186,6 g
Customs tariff number	85437090
Country of origin	DE

## Technical Data

### Product properties

Product type	Output signal conditioner
Product family	MACX Analog
No. of channels	2
Type	Ex i signal conditioners with SIL functional safety

### Insulation characteristics: GB Standard

Overvoltage category	II
Pollution degree	2

### Electrical properties

No. of channels	2
Electrical isolation	3-way isolation
Signal transmission behavior	In = Out
Step response (10-90%)	< 140 $\mu$ s (for 4 mA ... 20 mA step)
Maximum temperature coefficient	0.01 %/K
Temperature coefficient, typical	$\leq$ 0.005 %/K
Maximum transmission error	0.1 % (of final value)
Transmission error, typical	$\leq$ 0.05 % (of final value)

### Electrical isolation Input/output

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/power supply

Rated insulation voltage	50 V <sub>rms</sub>
Test voltage	1.5 kV AC (50 Hz, 60 s)
Insulation	Basic insulation in accordance with IEC/EN 61010-1

### Electrical isolation Output/supply

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 1/input 2, output 1/output 2

Test voltage	1.5 kV AC (50 Hz, 60 s)
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### Electrical isolation Output/input

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

Electrical isolation	375 V (Peak value in accordance with IEC/EN 60079-11)
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### Electrical isolation Output 1/output 2

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Electrical isolation	60 V (Peak value in accordance with IEC/EN 60079-11)
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## Supply

Nominal supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (24 V DC, -20 % ... +25 %)
Max. current consumption	< 85 mA (24 V DC / 20 mA)
Power dissipation	< 1.4 W (24 V DC / 20 mA)
Power consumption	≤ 2 W (24 V DC / 20 mA)

## Input data

### Signal: Current

Current input signal	0.2 mA ... 20 mA (Function)
	4 mA ... 20 mA (Safety)
	0 mA ... 24 mA (Underload/overload range)
Input current	≤ 30 mA
Input impedance	> 1 MΩ (If there is a line fault)
Line fault detection	> 0.2 mA (Response threshold of input current)
Voltage drop	< 2.4 V (at 20 mA)

## Output data

### Signal: Current

Output description	intrinsically safe
Current output signal	0.2 mA ... 20 mA (Function)
	4 mA ... 20 mA (Safety)
	0 mA ... 24 mA (Underload/overload range)
Load	100 Ω ... 700 Ω (20 mA)
	100 Ω ... 650 Ω (20.5 mA)
	100 Ω ... 500 Ω (24 mA)
Output ripple	< 20 mV <sub>rms</sub>
Non-load voltage	≤ 27 V
Line fault detection	> 10 kΩ (Line break)
	< 50 Ω (Short circuit)

## Connection data

Connection method	Screw connection
Stripping length	7 mm
Screw thread	M3
Conductor cross section rigid	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross section flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross section AWG	24 ... 14
Tightening torque	0.5 Nm ... 0.6 Nm

### COMBICON connection

Max. diameter	2 mm
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## Ex data

Ex installation (EPL)	Gc
	Div. 2
Ex i circuits (EPL)	Ga
	Da
	Ma
	Div. 1

## Safety data

Max. internal inductance $L_i$	negligible
Max. internal capacitance $C_i$	negligible
Max. output voltage $U_o$	25.2 V
Max. output current $I_o$	93 mA
Max. output power $P_o$	586 mW
Safety-related maximum voltage $U_m$	253 V AC (non-intrinsically-safe circuit)
	125 V DC (non-intrinsically-safe circuit)
IIA (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	10 mH / 2.9 $\mu$ F
IIB (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	4 mH / 817 nF
IIC (simple circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	2 mH / 104 nF
IIA (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	10 mH / 587 nF, 1 mH / 627 nF, 500 $\mu$ H / 717 nF, 200 $\mu$ H / 907 nF, 100 $\mu$ H / 1.1 $\mu$ F
IIB (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	4 mH / 367 nF, 1 mH / 427 nF, 500 $\mu$ H / 507 nF, 200 $\mu$ H / 657 nF, 100 $\mu$ H / 817 nF
IIC (mixed circuit): Max. external inductivity $L_o$ / Max. external capacitance $C_o$	2 mH / 46 nF, 1 mH / 60 nF, 500 $\mu$ H / 77 nF, 200 $\mu$ H / 104 nF

## Interfaces

### Data communication (bypass)

HART function	Yes
Protocols supported	HART-transparent

## Signaling

Status display	Green LED (supply voltage)
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## Dimensions

Width	12.5 mm
Height	112.5 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)
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Housing material	PA 6.6-FR
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## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 70 °C (Any mounting position)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Permissible humidity (operation)	5 % ... 95 % (non-condensing)

### Altitude range (≤ 2000 m (Ex))

Description	Ex applications
Altitude	≤ 2000 m (The technical data refers to altitudes ≤2000 m above mean sea level. For altitudes >2000 m above mean sea level, refer to the data sheet.)
Ambient temperature (operation)	-40 °C ... 70 °C
Rated insulation voltage	320 V (Power supply, input / output)

### Altitude range (≤ 3000 m (Ex))

Description	Ex applications
Height range	> 2000 m ... 3000 m
Ambient temperature (operation)	-40 °C ... 60 °C
Safety-related maximum voltage $U_m$	190 V AC (non-intrinsically-safe circuit) 110 V DC (non-intrinsically-safe circuit)
Rated insulation voltage	190 V (Power supply, input / output)

### Altitude range (≤ 4000 m (Ex))

Description	Ex applications
Height range	> 3000 m ... 4000 m
Ambient temperature (operation)	-40 °C ... 55 °C
Safety-related maximum voltage $U_m$	60 V AC (non-intrinsically-safe circuit) 60 V DC (non-intrinsically-safe circuit)
Rated insulation voltage	63 V (Power supply, input / output)

### Altitude range (≤ 5000 m (Ex))

Description	Ex applications
Height range	> 4000 m ... 5000 m
Ambient temperature (operation)	-40 °C ... 45 °C
Safety-related maximum voltage $U_m$	60 V AC (non-intrinsically-safe circuit) 60 V DC (non-intrinsically-safe circuit)
Rated insulation voltage	63 V (Power supply, input / output)

### Altitude range (≤ 2000 m)

Description	Non-Ex applications (EN 61010-1)
Altitude	≤ 2000 m (The technical data refers to altitudes ≤2000 m above mean sea level. For altitudes >2000 m above mean sea level, refer to the data sheet.)
Ambient temperature (operation)	-40 °C ... 70 °C

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Rated insulation voltage	300 V (Power supply, input / output)
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## Altitude range (≤ 3000 m)

Description	Non-Ex applications (EN 61010-1)
Height range	> 2000 m ... 3000 m
Ambient temperature (operation)	-40 °C ... 60 °C
Rated insulation voltage	150 V (Power supply, input / output)

## Altitude range (≤ 4000 m)

Description	Non-Ex applications (EN 61010-1)
Height range	> 3000 m ... 4000 m
Ambient temperature (operation)	-40 °C ... 55 °C
Rated insulation voltage	150 V (Power supply, input / output)

## Altitude range (≤ 5000 m)

Description	Non-Ex applications (EN 61010-1)
Height range	> 4000 m ... 5000 m
Ambient temperature (operation)	-40 °C ... 45 °C
Rated insulation voltage	150 V (Power supply, input / output)

## Approvals

### CE

Certificate	CE-compliant
Note	and EN 61326

### ATEX

Identification	Ⓢ I (M1) [Ex ia Ma] I
	Ⓢ II (1) G [Ex ia Ga] IIC
	Ⓢ II (1) D [Ex ia Da] IIIC
	Ⓢ II 3(1) G Ex ec [ia Ga] IIC T4 Gc
Certificate	BVS 20 ATEX E 004 X

### IECEX

Identification	[Ex ia Ma] I
	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex ec [ia Ga] IIC T4 Gc
Certificate	IECEX BVS 20.0003X

### CCC / China-Ex

Identification	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex ec [ia Ga] IIC T4 Gc
Certificate	2021122316114080

### INMETRO

	[Ex ia Ma] I
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# MACX MCR-EX-IDS-2I-2I - Output signal conditioner



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Identification	[Ex ia Ga] IIC
	[Ex ia Da] IIIC
	Ex ec [ia Ga] IIC T4 Gc
Certificate	DNV 21.0092 X

## UL, USA/Canada

Identification	UL 61010 Listed
	Class I Div 2; IS for Class I, II, III Div 1
Certificate	UL® C.D.-No 83104549

## Shipbuilding approval

Certificate	DNV GL TAA00000AG
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## Safety Integrity Level (SIL, IEC 61508)

Identification	3
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## EAC

Identification	[Ex ia Ga] IIC X
	2Ex e [ia Ga] IIC T4 Gc X
Certificate	RU C-DE.HB49.B.00145/21

## DNV GL data

Temperature	B
Humidity	B
Vibration	A
EMC	B
Enclosure	Required protection according to the Rules shall be provided upon installation on board

## EMC data

Noise immunity	EN 61000-6-2
Note	When being exposed to interference, there may be minimal deviations.
Electromagnetic compatibility	Conformance with EMC directive
Noise emission	EN 61000-6-4

## Standards and regulations

Electrical isolation	3-way isolation
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## GB Standard

Standards/regulations	GB 3836.1
	GB 3836.3
	GB 3836.4

## Mounting

Mounting type	DIN rail mounting
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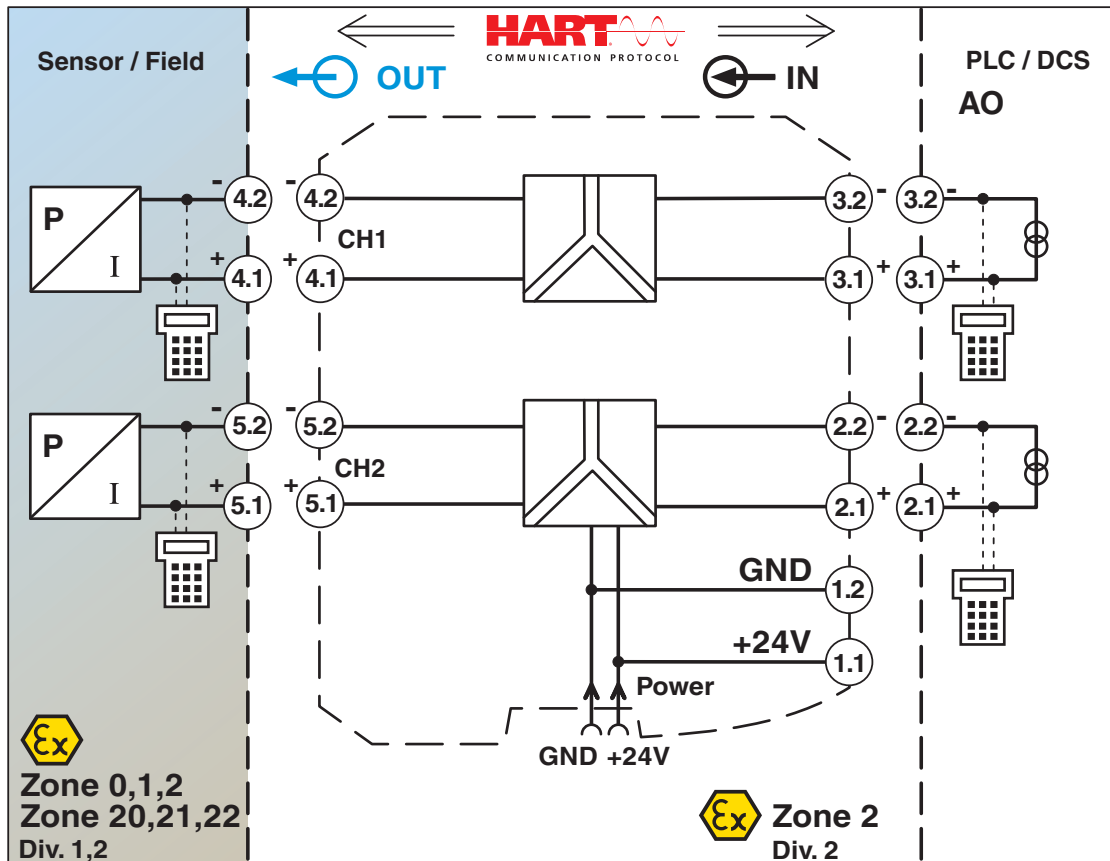
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## Drawings

Block diagram





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<https://www.phoenixcontact.com/de/produkte/2865421>

## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/de/produkte/2865421>



**DNV GL**

Approval ID: TAA00000AG



**UL Listed**

Approval ID: FILE E 330267



**CCC**

Approval ID: 2021122316114080



**cUL Listed**

Approval ID: FILE E 330267



**DNV GL**

Approval ID: TAA00000AG

**Functional Safety**

Approval ID: ZP/C002/20



**IECEx**

Approval ID: IECEx BVS 20.0003X



**cUL Listed**

Approval ID: FILE E 199827



**UL Listed**

Approval ID: FILE E 199827



**ATEX**

Approval ID: BVS 20 ATEX E 004 X

**INMETRO**

Approval ID: DNV 21.0092 X

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**EAC Ex**

Approval ID: RU C-DE.HB49.B.00145

**cULus Listed**

**cULus Listed**

# MACX MCR-EX-IDS-2I-2I - Output signal conditioner



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## Classifications

### ECLASS

ECLASS-11.0	27210120
ECLASS-12.0	27210120
ECLASS-13.0	27210120

### ETIM

ETIM 8.0	EC002653
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### UNSPSC

UNSPSC 21.0	39121000
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## Environmental Product Compliance

REACH SVHC	Lead 7439-92-1
China RoHS	Environmentally Friendly Use Period = 50 years
	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/de/produkte/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



### TC-2D37SUB-ADIO32-2EX-P-UNI - Module carrier

2904684

<https://www.phoenixcontact.com/de/produkte/2904684>

Universal Termination Carrier for connecting 16 two-channel MACX Analog Ex i signal conditioners to digital or analog I/O cards, via two D-SUB connectors, 37-pos. (1:1 connection)



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<https://www.phoenixcontact.com/de/produkte/2865421>

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

2865625

<https://www.phoenixcontact.com/de/produkte/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/de/produkte/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

# MACX MCR-EX-IDS-2I-2I - Output signal conditioner

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<https://www.phoenixcontact.com/de/produkte/2865421>



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

2904614

<https://www.phoenixcontact.com/de/produkte/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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## MPS-IH WH - Insulating sleeve

0201663

<https://www.phoenixcontact.com/de/produkte/0201663>

Insulating sleeve, color: white



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<https://www.phoenixcontact.com/de/produkte/2865421>

## MPS-IH RD - Insulating sleeve

0201676

<https://www.phoenixcontact.com/de/produkte/0201676>

Insulating sleeve, color: red



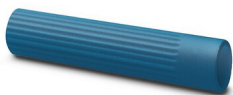
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## MPS-IH BU - Insulating sleeve

0201689

<https://www.phoenixcontact.com/de/produkte/0201689>

Insulating sleeve, color: blue





# MACX MCR-EX-IDS-2I-2I - Output signal conditioner



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## MPS-IH YE - Insulating sleeve

0201692

<https://www.phoenixcontact.com/de/produkte/0201692>

Insulating sleeve, color: yellow



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## MPS-IH GN - Insulating sleeve

0201702

<https://www.phoenixcontact.com/de/produkte/0201702>

Insulating sleeve, color: green



# MACX MCR-EX-IDS-2I-2I - Output signal conditioner

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## MPS-IH GY - Insulating sleeve

0201728

<https://www.phoenixcontact.com/de/produkte/0201728>

Insulating sleeve, color: gray



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## MPS-IH BK - Insulating sleeve

0201731

<https://www.phoenixcontact.com/de/produkte/0201731>

Insulating sleeve, color: black



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<https://www.phoenixcontact.com/de/produkte/2865421>

## MPS-MT - Test plugs

0201744

<https://www.phoenixcontact.com/de/produkte/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/de/produkte/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-IDS-2I-2I - Output signal conditioner



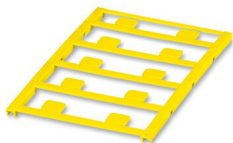
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<https://www.phoenixcontact.com/de/produkte/2865421>

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

0822602

<https://www.phoenixcontact.com/de/produkte/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/de/produkte/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-IDS-2I-2I - Output signal conditioner



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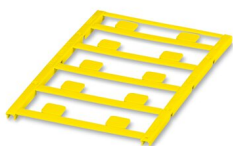
<https://www.phoenixcontact.com/de/produkte/2865421>

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

0824548

<https://www.phoenixcontact.com/de/produkte/0824548>

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



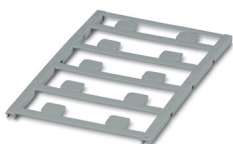
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## UC-EMLP (11X9) SR - Plastic label

0828094

<https://www.phoenixcontact.com/de/produkte/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/de/produkte/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/de/produkte/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

# MACX MCR-EX-IDS-2I-2I - Output signal conditioner



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

0828871

<https://www.phoenixcontact.com/de/produkte/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/de/produkte/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

# MACX MCR-EX-IDS-2I-2I - Output signal conditioner



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

0831678

<https://www.phoenixcontact.com/de/produkte/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/de/produkte/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





# MACX MCR-EX-IDS-2I-2I - Output signal conditioner



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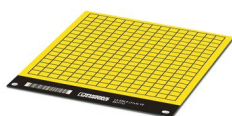
<https://www.phoenixcontact.com/de/produkte/2865421>

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

0831732

<https://www.phoenixcontact.com/de/produkte/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/de/produkte/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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