

# Data sheet

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**M12 Bus-/Railcat connection line, D-coded, 1.0 m,  
M12 plug - M12 jack, 4-pole, RADOX®**

P/N

142MOD12010

EAN 4251394663319

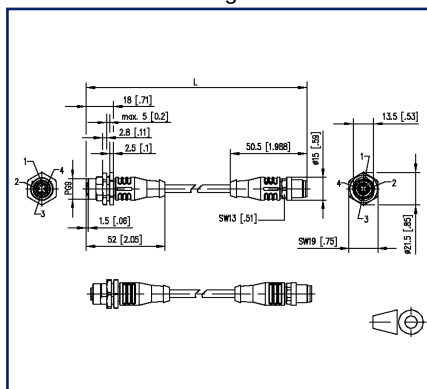
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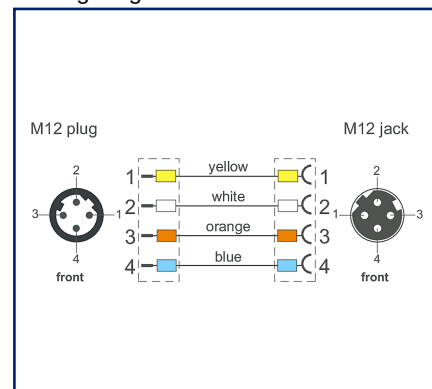
## Illustrations



Dimensional drawing



Wiring diagram



See enlarged drawings at the end of document

## Product specification

Halogen-free, electron beam crosslinked Cat.5 wire with improved fire resistance. Very good properties in terms of NEXT, attenuation and shield design. This wire is used in fixed and protected installation in railway vehicles and buses and meets the fire protection requirement according to EN 45545-2 (HL1 - HL3). It is optimally suited for Ethernet applications of class D (ECN and ETB) according to IEEE 802.3. For installation, the notes according to EN 50355 and EN 50343 must be observed. Because of the thin diameter, this wire is especially useful for connecting the overmolded RJ45 connectors. RADOX® is a registered trademark of HUBER+SUHNER AG, Switzerland. Special properties: flame retardant, RoHs compliant, halogen free, increased thermal load capacity, low smoke emission, oil and fuel resistant, UN ECE-R 118.01. Fire protection: DIN EN 45545-2 HL1-3, DIN 5510 fire protection levels 1-4, NF F16-101 category A1, A2, B, UNI CEI 11170, danger level LR1-LR4, UN ECE-R 118.01

- Standard variants: 1.0 m, 2.0 m, 5.0 m, 10.0 m.
- Other cable lengths on request.



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## Technical Data

### General Data

|                         |                                                           |
|-------------------------|-----------------------------------------------------------|
| Fields of application   | Railway vehicle<br>Buses                                  |
| Applications            | Train Communication Network: ETB– Ethernet Train Backbone |
| Design                  | Ethernet-Connection line                                  |
| Cable length (m)        | 1 m                                                       |
| Cable length (ft)       | 3.28 ft                                                   |
| Cable                   |                                                           |
| Cable Type              | S/FTP                                                     |
| Wiring                  | Profinet                                                  |
| Wire color              | yellow, white, orange, blue                               |
| Color - cable jacket    | blue                                                      |
| Transmission properties | Cat.5                                                     |
| Connection 1            |                                                           |
| Shielding               | shielded                                                  |
| Dimension (L x W x H)   | 50.5 mm x 15 mm x 15 mm                                   |
| Dimension (L x W x H)   | 1.988 in. x 0.591 in. x 0.591 in.                         |
| Connection 2            |                                                           |
| Shielding               | shielded                                                  |
| Dimension (L x W x H)   | 52 mm x 21.5 mm x 21.5 mm                                 |
| Dimension (L x W x H)   | 2.047 in. x 0.846 in. x 0.846 in.                         |

### Connections/interfaces

|                                    |          |
|------------------------------------|----------|
| Cable                              |          |
| Conductor cross section AWG        | AWG 22   |
| Conductor diameter (mm)            | 0.75 mm  |
| Conductor diameter (inch)          | 0.03 in. |
| Cable construction                 | 1x4      |
| Stranded wire structure            | 7x0.25mm |
| Outer diameter cable jacket (mm)   | 6.6 mm   |
| Outer diameter cable jacket (inch) | 0.26 in. |
| Connection 1                       |          |
| Connector type                     | M12-plug |
| Coding                             | D-coded  |



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**Technical Data**
**Connections/interfaces**
**Connection 1**

|                                    |                        |
|------------------------------------|------------------------|
| Type of plug contact, field side   | Male (plug)            |
| Cable feed arrangement, field side | straight               |
| Number of poles                    | 4                      |
| Pin Assignment                     | 1 YE, 2 WH, 3 OG, 4 BU |
| Latching lever protection          | no                     |
| Color of the cable boot            | black                  |

**Connection 2**

|                                    |                        |
|------------------------------------|------------------------|
| Connector type                     | M12-jack               |
| Coding                             | D-coded                |
| Type of plug contact, field side   | Female (bus)           |
| Cable feed arrangement, field side | straight               |
| Number of poles                    | 4                      |
| Pin Assignment                     | 1 YE, 2 OG, 3 WH, 4 BU |
| Color of the cable boot            | black                  |

**Electrical characteristics**
**Connection 1**

|                                              |     |
|----------------------------------------------|-----|
| Current carrying capacity per pin (at 40 °C) | 4 A |
|----------------------------------------------|-----|

**Connection 2**

|                                              |     |
|----------------------------------------------|-----|
| Current carrying capacity per pin (at 40 °C) | 4 A |
|----------------------------------------------|-----|

**Mechanical data**
**Cable**

|                        |             |
|------------------------|-------------|
| Bending radius (fixed) | 6 x Ø cable |
|------------------------|-------------|

**Connection 1**

|                 |                        |
|-----------------|------------------------|
| Mechanical life | min. 100 mating cycles |
|-----------------|------------------------|

**Connection 2**

|                 |                        |
|-----------------|------------------------|
| Mechanical life | min. 100 mating cycles |
|-----------------|------------------------|



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## Technical Data

### Materials and material properties

#### Cable

|                            |                                       |
|----------------------------|---------------------------------------|
| Material - Cable jacket    | RADOX® EM 104 according to EN 50264-1 |
| Material - Wire insulation | RADOX Foam                            |
| Flame retardancy           | yes, according to IEC 60332-1-2       |
| Halogen free               | yes, according to EN 60754-1/2        |
| Oil resistance             | yes, according to EN IEC 60811-404    |
| UV-resistance              | yes                                   |

#### Connection 1

|                            |                            |
|----------------------------|----------------------------|
| Material - Contact         | CuZnPb (brass)             |
| Material - Contact surface | Au (gold)                  |
| Material - Contact carrier | Plastics, PA, BK           |
| Material - Body            | Plastics, TPU, BK          |
| Material - Cap nut         | Metal, CuZn, nickel-plated |

#### Connection 2

|                            |                            |
|----------------------------|----------------------------|
| Material - Contact         | CuZnPb (brass)             |
| Material - Contact surface | Au (gold)                  |
| Material - Contact carrier | Plastics, PA, BK           |
| Material - Body            | Plastics, TPU, BK          |
| Material - Flange housings | Metal, CuZn, nickel-plated |
| Material - Sealing (jack)  | FPM/FKM                    |
| Material - Outer sealing   | NBR                        |

|      |           |
|------|-----------|
| RoHS | compliant |
|------|-----------|

### Environmental conditions

#### Cable

|                           |                     |
|---------------------------|---------------------|
| Temperature range (fixed) | -50 °C - max. 90 °C |
| Temperature range (fixed) | -58 °F - 194 °F     |

#### Connection 1

|                               |                                                |
|-------------------------------|------------------------------------------------|
|                               | -40 °C                                         |
|                               | -40 °F                                         |
| Protection category (mounted) | IP67 (-30 °C...+90 °C), IP65 (-40 °C...+90 °C) |



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## Technical Data

### Environmental conditions

#### Connection 2

|                               |                                                |
|-------------------------------|------------------------------------------------|
| Protection category (mounted) | IP67 (-30 °C...+90 °C), IP65 (-40 °C...+90 °C) |
| Operating temperature classes | OT1 - OT4                                      |
| Operating temperature range   | -40 to 70                                      |

### Standards/Regulations

|                                                                  |                                               |
|------------------------------------------------------------------|-----------------------------------------------|
| General requirements                                             | ISO/IEC 11801-1   DIN EN 50173-1              |
| Cable                                                            |                                               |
| Railway vehicle - Electronic equipment on railway vehicles       | DIN EN 50155:2021                             |
| Railway vehicle - Fire protection in railway vehicles            | DIN EN 45545-2:2020 Hazard Level 1-3          |
| Railway vehicle - Preventive fire protection in railway vehicles | DIN 5510-2:2009-05 Fire protection levels 1-4 |
| Railway vehicle - Fire behaviour Material selection              | UNI CEI 11170-1/2/3 Hazard level LR1-LR4      |
| Buses - Fire safety                                              | UN ECE-R 118.01                               |

#### Connection 1

|                                                            |                                      |
|------------------------------------------------------------|--------------------------------------|
| Circular connector                                         | DIN EN 61076-2-101:2013              |
| Shock and vibration                                        | Class 1, category B (DIN EN 61373)   |
| Degrees of Protection Provided by Enclosures               | EN 60529:1991 + A1:2000 + A2:2013    |
| Railway vehicle - Electronic equipment on railway vehicles | DIN EN 50155:2021                    |
| Railway vehicle - Fire protection in railway vehicles      | DIN EN 45545-2:2020 Hazard Level 1-3 |

#### Connection 2

|                                                            |                                      |
|------------------------------------------------------------|--------------------------------------|
| Circular connector                                         | DIN EN 61076-2-101:2013              |
| Shock and vibration                                        | Class 1, category B (DIN EN 61373)   |
| Degrees of Protection Provided by Enclosures               | EN 60529:1991 + A1:2000 + A2:2013    |
| Railway vehicle - Electronic equipment on railway vehicles | DIN EN 50155:2021                    |
| Railway vehicle - Fire protection in railway vehicles      | DIN EN 45545-2:2020 Hazard Level 1-3 |

### Classifications

|          |          |
|----------|----------|
| ETIM 8.0 | EC002599 |
| ETIM 9.0 | EC002599 |



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**Technical Data****Packing details**

|                   |                       |
|-------------------|-----------------------|
| Type of packaging | 1 pc(s) / plastic bag |
|-------------------|-----------------------|

**Application note**

This product is a standard product of METZ CONNECT. METZ CONNECT is not aware of the specific intended use of the goods by the Customer or any customers of the Customer. The Customer guarantees that it has fully and sufficiently tested the use of the goods and any product modifications, product changes or product enhancements with regard to the specific intended use in accordance with the state of the art or in any other way. At METZ CONNECT's request, the Customer shall submit and make available meaningful evidence (e.g. test and laboratory protocols, certifications, etc.).



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**Accessories**

| P/N             | Designation                                                             |
|-----------------|-------------------------------------------------------------------------|
| MMF881A115      | M12 jack, D-coded, IP67, Cat.5, Ø 6-9.7 mm, field assembly, straight    |
| MMF881A115-0001 | M12 jack, D-coded, IP67, Cat.5, Ø 6-9.7 mm, field assembly, with flange |
| MNF881A115      | M12 plug, D-coded, IP67, Cat.5, Ø 6-9.7 mm, field assembly, straight    |
| MWN811A115      | M12 Panel feed through adapters, D-coded, to RJ45 - straight            |



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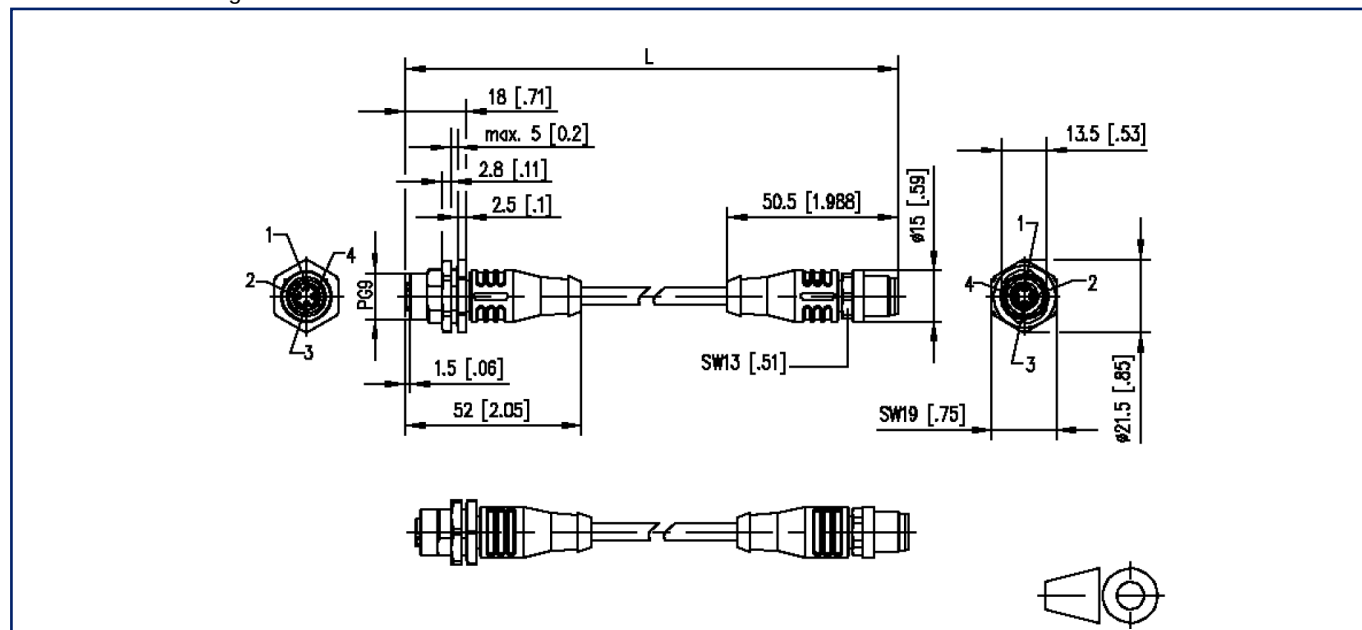
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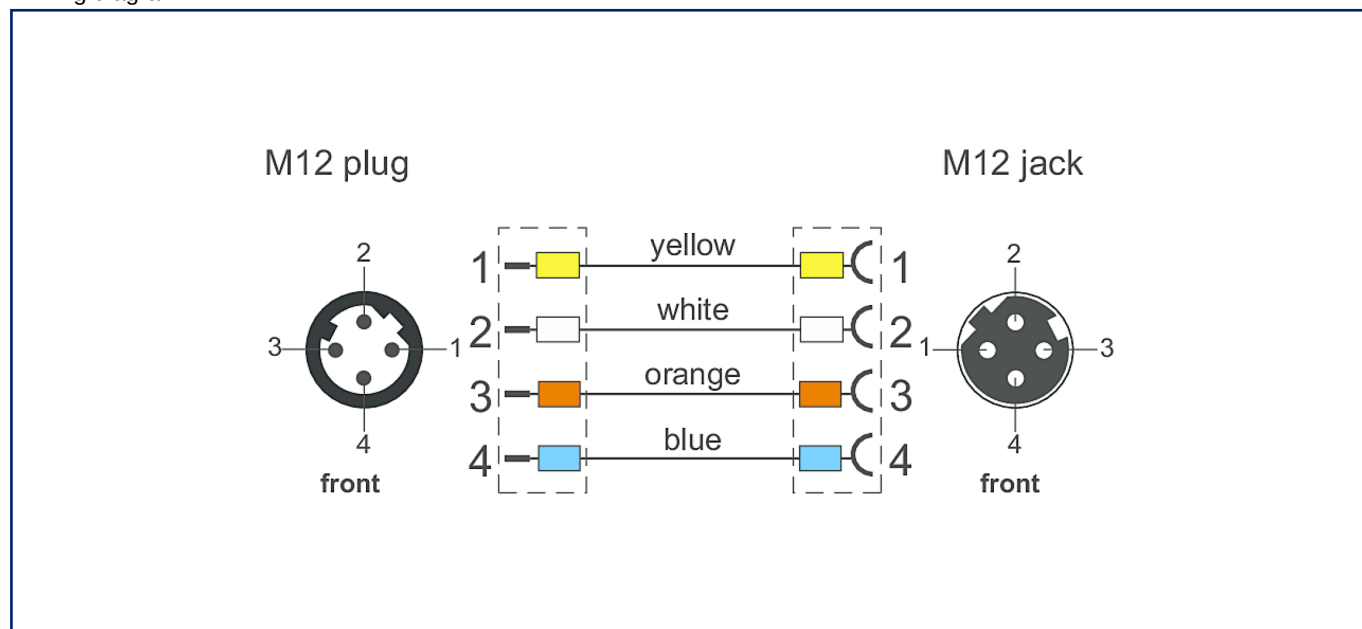
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## Illustrations

### Dimensional drawing



### Wiring diagram



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Principle diagram

