

# NBC-MSD/ 5,0-937/MSD SCO RAIL - Network cable



1407343

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Network cable, PROFINET CAT5 (100 Mbps), Ethernet CAT5 (100 Mbps), 4-position, PE-X halogen-free, black RAL 9005, shielded, Plug straight M12 SPEEDCON, coding: D / IP65, on Plug straight M12 SPEEDCON, coding: D / IP65, cable length: 5 m, For railway applications

## Your advantages

- Easy and safe: 100 % electrically tested plug-in components
- Securely locked by special vibration brake
- Resistant to temperature influences – tested for an extended temperature range and for resistance to temperature shocks
- Reliable signal transmission – 360° shielding in environments with electromagnetic interference

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 1407343       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | BF04          |
| Product key                          | AF1CJN        |
| GTIN                                 | 4046356774598 |
| Weight per piece (including packing) | 353 g         |
| Weight per piece (excluding packing) | 353 g         |
| Customs tariff number                | 85444290      |
| Country of origin                    | PL            |

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## Technical data

### Product properties

|                      |                         |
|----------------------|-------------------------|
| Product type         | Data cable preassembled |
| Application          | Railway applications    |
| Number of positions  | 4                       |
| No. of cable outlets | 1                       |
| Shielded             | yes                     |
| Coding               | D                       |

### Insulation characteristics

|                      |    |
|----------------------|----|
| Overvoltage category | II |
| Degree of pollution  | 3  |

### Interfaces

|                      |                                     |
|----------------------|-------------------------------------|
| Bus system           | PROFINET                            |
|                      | Ethernet                            |
| Signal type/category | PROFINET CAT5 (IEC 11801), 100 Mbps |
|                      | Ethernet CAT5 (IEC 11801), 100 Mbps |

### Signaling

|                        |    |
|------------------------|----|
| Status display         | no |
| Status display present | no |

### Electrical properties

|   |                       |
|---|-----------------------|
| Nominal voltage $U_N$                   | 48 V AC               |
|   | 60 V DC               |
| Nominal current $I_N$                   | 4 A                   |
| Transmission medium                     | Copper                |
| Transmission speed                      | 100 Mbps              |
| Transmission characteristics (category) | CAT5 (IEC 11801:2002) |

### Material specifications

|  |    |
|--|----|
| Flammability rating according to UL 94 | V0 |
|--|----|

### Connector

#### Connection 1

|                     |                                   |
|---------------------|-----------------------------------|
| Type                | Plug straight M12 SPEEDCON / IP65 |
| Number of positions | 4                                 |
| Locking type        | SPEEDCON                          |
| Coding type         | D (Data)                          |
| Shielded            | yes                               |
| Handle color        | black                             |
|                     | CuSn (Contact)                    |

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|                                 |   |
|---------------------------------|---|
| Material                        | Ni/Au (Contact surface)   |
|                                 | PA 6.6 (Contact carrier)  |
|                                 | PA 6.6 (Grip body)  |
|                                 | Zinc die-cast, nickel-plated (Screw connection)   |
| Standards/regulations           | PA 6.6: Fire protection in rail vehicles - requirement sets R22, R23, and R24 acc. to DIN EN 45545-2 (Risk level HL1 - HL3) |
| Insertion/withdrawal cycles     | ≥ 100   |
| Insulation resistance           | ≥ 100 MΩ  |
| Tightening torque               | 0.4 Nm  |
| Degree of protection            | IP65  |
| Ambient temperature (operation) | -40 °C ... 85 °C  |


## Connection 2

|                                 |   |
|---------------------------------|---|
| Type                            | Plug straight M12 SPEEDCON / IP65   |
| Number of positions             | 4   |
| Locking type                    | SPEEDCON  |
| Coding type                     | D (Data)  |
| Shielded                        | yes   |
| Handle color                    | black   |
| Material                        | CuSn (Contact)  |
|                                 | Ni/Au (Contact surface)   |
|                                 | PA 6.6 (Contact carrier)  |
|                                 | PA 6.6 (Grip body)  |
|                                 | Zinc die-cast, nickel-plated (Screw connection)   |
| Standards/regulations           | PA 6.6: Fire protection in rail vehicles - requirement sets R22, R23, and R24 acc. to DIN EN 45545-2 (Risk level HL1 - HL3) |
| Insertion/withdrawal cycles     | ≥ 100   |
| Insulation resistance           | ≥ 100 MΩ  |
| Tightening torque               | 0.4 Nm  |
| Degree of protection            | IP65  |
| Ambient temperature (operation) | -40 °C ... 85 °C  |

## Cable/line

|              |     |
|--------------|-----|
| Cable length | 5 m |
|--------------|-----|

## PROFINET RADOX® railway application CAT5 [937]

|                     |  |
|---------------------|--|
| Dimensional drawing |  |
| Cable weight        | 70 kg/km   |

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|   |  |
|---|--|
| Number of positions                         | 4  |
| Shielded                                    | yes  |
| Cable type                                  | PROFINET RADOX® railway application CAT5 [937] |
| Conductor structure                         | 1x4xAWG22/7, SF/TQ                             |
| Signal speed                                | 75 c   |
| Conductor structure signal line             | 7x 0.25 mm                                     |
| AWG signal line                             | 22   |
| Conductor cross-section                     | 4x 0.34 mm <sup>2</sup>                        |
| Wire diameter incl. insulation              | approx. 1.5 mm                                 |
| External cable diameter                     | 6.60 mm ±0.4 mm                                |
| Outer sheath, material                      | PE-X   |
| External sheath, color                      | black RAL 9005                                 |
| Conductor material                          | silver-plated Cu litz wires                    |
| Material wire insulation                    | Foamed PE                                      |
| Single wire, color                          | white-blue, orange-yellow                      |
| Thickness, outer sheath                     | approx. 1.00 mm                                |
| Overall twist                               | Star quad                                      |
| Max. conductor resistance                   | ≤ 54.4 Ω/km                                    |
| Coupling resistance                         | 200.00 mΩ/m (f ≤ 30 MHz)                       |
| Wave impedance                              | 100 Ω ±5 Ω (f = 100 MHz)                       |
| Working capacitance                         | ≤ 65 pF (Line-line)                            |
|   | ≤ 100 pF (Line-shield)                         |
| Nominal voltage, cable                      | 300 V AC                                       |
| Test voltage                                | 2000 V AC (50 Hz, 5 minutes)                   |
| Minimum bending radius, fixed installation  | 6 x D  |
| Smallest bending radius, fixed installation | 40 mm  |
| Near end crosstalk attenuation (NEXT)       | 73 dB (with 1 MHz)                             |
|   | 70 dB (at 4 MHz)                               |
|   | 65 dB (at 10 MHz)                              |
|   | 57 dB (at 31.5 MHz)                            |
|   | 52 dB (at 62.5 MHz)                            |
|   | 48 dB (at 100 MHz)                             |
| Return attenuation (RL)                     | 25 dB (at 4 MHz)                               |
|   | 30 dB (at 10 MHz)                              |
|   | 30 dB (at 31.5 MHz)                            |
|   | 30 dB (at 62.5 MHz)                            |
|   | 28 dB (at 100 MHz)                             |
|   | 28 dB (at 100 MHz)                             |
| Remote crosstalk attenuation (FEXT)         | 78 dB (with 1 MHz)                             |
|   | 77 dB (at 4 MHz)                               |
|   | 70 dB (at 10 MHz)                              |
|   | 65 dB (at 31.5 MHz)                            |
|   | 56 dB (at 62.5 MHz)                            |
|   | 48 dB (at 100 MHz)                             |
|   | 2 dB (with 1 MHz)                              |

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|                                    |  |
|------------------------------------|--|
| Shield attenuation                 | 4.4 dB (at 4 MHz)  |
|                                    | 7.4 dB (at 10 MHz)   |
|                                    | 14 dB (at 31.5 MHz)  |
|                                    | 20 dB (at 62.5 MHz)  |
|                                    | 26 dB (at 100 MHz)   |
|                                    | 40.00 dB (30 MHz ≤ f ≤ 100 MHz)                            |
| Halogen-free                       | in accordance with EN 50267-2-1                            |
| Flame resistance                   | IEC 60332-1-2  |
|                                    | EN 50266   |
|                                    | EN 60332-3-25  |
|                                    | NF C32-070, 2.1  |
|                                    | NF C32-070, 2.2  |
|                                    | UL 1685, 12 (FT4)  |
|                                    | in accordance with ISO 6722-1 5.22 (UN ECE-R 118.01)       |
| Fume corrosiveness                 | EN 50267-2-2   |
| Fume toxicity                      | BS 6853 B.1  |
|                                    | EN 50305, 9.2  |
| Concentration of fumes             | BS 6853 D.8.7  |
|                                    | EN 61034-2   |
|                                    | UL 1685, 12 (FT4)  |
| Resistance to oil                  | according to IRM 902, 72 h at 100 °C                       |
| Fire protection in rail vehicles   | BS 6853 (Category Ia, Ib, II)                              |
|                                    | GM/RT 2130 (Category Ia, Ib, II)                           |
|                                    | EN 45545 (Risk level HL1 - HL3)                            |
|                                    | DIN 5510 (Fire protection level 1, 2, 3, 4)                |
|                                    | NF F16-101 (Category A1, A2, B)                            |
|                                    | NF F16-101 (Class C/F0)                                    |
|                                    | NFPA 130   |
|                                    | UNI CEI 11170 (Risk level LR1 - LR4)                       |
| Other resistance                   | Resistance to fuels (according to IRM 903, 168 h at 70 °C) |
| Ambient temperature (operation)    | -50 °C ... 90 °C (cable, fixed installation)               |
|                                    | -40 °C ... 90 °C (Cable, flexible installation)            |
| Ambient temperature (installation) | -25 °C ... 90 °C   |

## Environmental and real-life conditions

### Ambient conditions

|                      |      |
|----------------------|------|
| Degree of protection | IP65 |
|----------------------|------|

## Standards and regulations

### M12

|                          |                  |
|--------------------------|------------------|
| Standard designation     | M12 connector    |
| Standards/specifications | IEC 61076-2-101  |
| Standard designation     | Shock, vibration |

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Standards/specifications

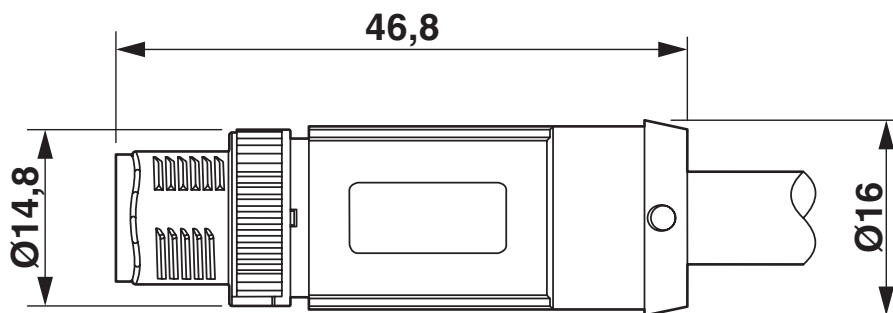
EN 50155

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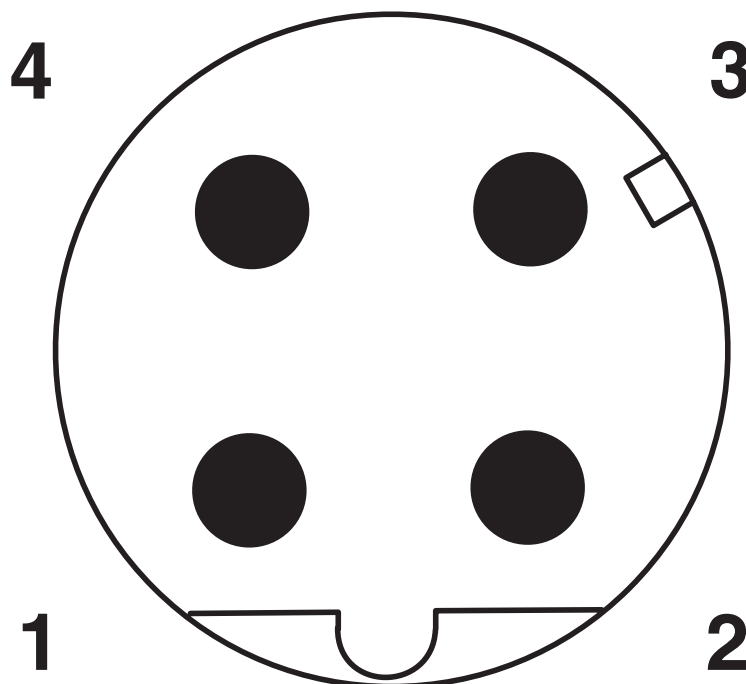
## Drawings

Dimensional drawing



M12 SPEEDCON plug, straight, shielded

Schematic diagram

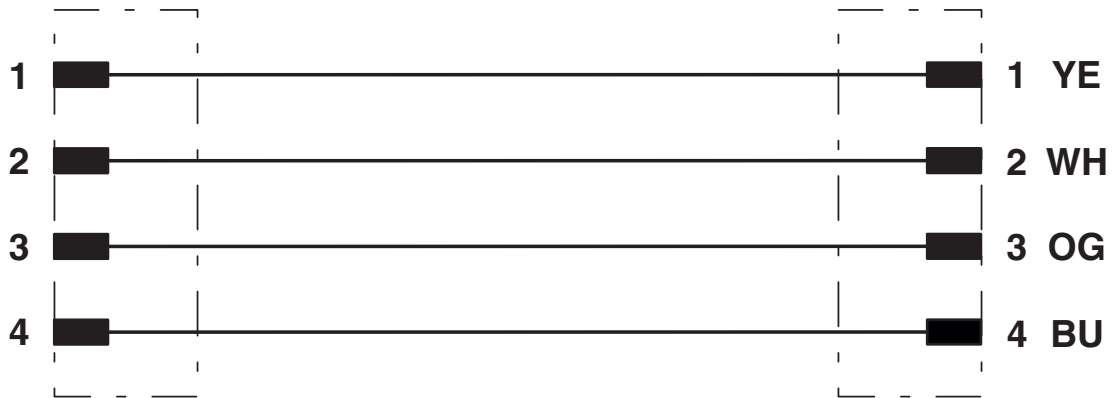


Pin assignment M12 male connector, 4-pos., D-coded, male side

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Circuit diagram



Contact assignment of the M12 plugs

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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1407343>



**EAC-RoHS**

Approval ID: RU D-DE.HB35.B.00387

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27060307 |
| ECLASS-15.0 | 27060307 |

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 26121600 |
|-------------|----------|

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## Environmental product compliance

### EU RoHS

|   |                    |
|---|--------------------|
| Fulfills EU RoHS substance requirements | Yes, No exemptions |
|---|--------------------|

### China RoHS

|  |  |
|--|--|
| Environment friendly use period (EFUP) | EFUP-E                                   |
|  | No hazardous substances above the limits |

### EU REACH SVHC

|                                     |   |
|-------------------------------------|---|
| REACH candidate substance (CAS No.) | 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol(CAS: 119-47-1) |
| SCIP                                | ba8da5af-4c91-4c64-a955-294ae8c7afd7                        |

### EF3.1 Climate Change

|         |             |
|---------|-------------|
| CO2e kg | 3.2 kg CO2e |
|---------|-------------|

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