# Network cable - NBC-MSD/ 4,8-939/MSD SCO SI - 1418847

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Network cable, PROFINET CAT5 (100 Mbps), 4-position, PE-X halogen-free, black, shielded, Plug straight M12 SPEEDCON / IP65, coding: D, on Plug straight M12 SPEEDCON / IP65, coding: D, cable length: 4.8 m, Product tested according to customer specification/rail application

## Key Commercial Data

| | |
|---|---|
| Packing unit | 1 pc |
| Minimum order quantity | 50 pc |
| GTIN | 4 055626 274461 |
| GTIN | 4055626274461 |
| Weight per Piece (excluding packing) | 350.130 g |
| Custom tariff number | 85444290 |
| Country of origin | Poland |
| Note | Made to Order (non-returnable) |

## Technical data

### Dimensions

| | |
|---|---|
| Length of cable | 4.8 m |

### General data

| | |
|---|---|
| Note | The cable is 100% electrically tested for continuity. |
| Rated current at 40°C | 4 A |
| Rated voltage | 48 V AC |
| | 60 V DC |
| Number of positions | 4 |
| Signal type/category | PROFINET CAT5 (IEC 11801), 100 Mbps |
| Standards/regulations | M12 connector IEC 61076-2-101 |
| Overvoltage category | II |
| Degree of pollution | 3 |

### Characteristics head 1

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## Technical data

### Characteristics head 1

| | |
|---|---|
| Head type | Plug straight M12 SPEEDCON / IP65 |
| No. of positions (pin connector pattern) | 4 |
| Coding | D (Data) |
| Color | black |
| Material (component) | CuSn (Contact) |
| | Ni/Au (Contact surface) |
| | PA (Contact carriers) |
| | TPU, hardly inflammable, self-extinguishing (Grip) |
| | Zinc die-cast, nickel-plated (Screw connection) |
| Shielded | yes |
| Insulation resistance | ≥ 100 MΩ |
| Test voltage | 500 V DC ±15 V DC (for 60 s, insulation resistance according to DIN EN 60512-3-1) |
| | 1.4 kV AC (for 60 s, dielectric strength according to DIN EN 60512-4-1) |
| Insertion/withdrawal cycles | ≥ 100 (Quantity: 500 with Phoenix Contact mating connector) |
| Torque | 0.4 Nm |
| Ambient temperature (operation) | -40 °C ... 90 °C |
| Weight | 10 g ±5 g |

### Characteristics head 2

| | |
|---|---|
| Head type | Plug straight M12 SPEEDCON / IP65 |
| No. of positions (pin connector pattern) | 4 |
| Coding | D (Data) |
| Color | black |
| Material (component) | CuSn (Contact) |
| | Ni/Au (Contact surface) |
| | PA (Contact carriers) |
| | TPU, hardly inflammable, self-extinguishing (Grip) |
| | Zinc die-cast, nickel-plated (Screw connection) |
| Shielded | yes |
| Insulation resistance | ≥ 100 MΩ |
| Test voltage | 500 V DC ±15 V DC (for 60 s, insulation resistance according to DIN EN 60512-3-1) |
| | 1.4 kV AC (for 60 s, dielectric strength according to DIN EN 60512-4-1) |
| Insertion/withdrawal cycles | ≥ 100 (Quantity: 500 with Phoenix Contact mating connector) |
| Torque | 0.4 Nm |
| Ambient temperature (operation) | -40 °C ... 90 °C |
| Weight | 10 g ±5 g |

### Standards and Regulations

| | |
|---|---|
| Standard designation | M12 connector |
| Standards/regulations | IEC 61076-2-101 |

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### Standards and Regulations

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

### Cable

| | |
|---|---|
| Cable type | PROFINET railway applications |
| Cable type (abbreviation) | 939 |
| Signal type/category | PROFINET CAT5 (IEC 11801), 100 Mbps |
| Cable structure | 1x4xAWG22/7; SF/TQ |
| Conductor cross section | 4x 0.34 mm² |
| AWG signal line | 22 |
| Conductor structure signal line | 7x 0.25 mm |
| Core diameter including insulation | 1.4 mm ±0.1 mm |
| Wire colors | white-blue, orange-yellow |
| Overall twist | Star quad |
| Shielding | Aluminum-lined polyester foil, tinned copper braided shield |
| External sheath, color | black |
| Outer sheath thickness | 1 mm |
| External cable diameter D | 6.6 mm ±0.2 mm |
| Minimum bending radius, fixed installation | 5 x D |
| Minimum bending radius, flexible installation | 6 x D |
| Tensile strength GRP | ≤ 60 N (temporary) |
| | ≤ 15 N (Permanent) |
| Cable weight | 71 kg/km |
| Outer sheath, material | PE-X |
| Material conductor insulation | Cell PE |
| Conductor material | Tin-plated Cu litz wires |
| Insulation resistance | ≥ 5 GΩ*km |
| Conductor resistance | ≤ 54.4 Ω/km |
| Cable capacity | 44 nF/km (core-core) |
| Wave impedance | 100 Ω ±5 Ω (f = 100 MHz) |
| Near end crosstalk attenuation (NEXT) | 76 dB (with 1 MHz) |
| | 71 dB (at 4 MHz) |
| | 64 dB (at 10 MHz) |
| | 60 dB (at 16 MHz) |
| | 56 dB (at 31.25 MHz) |
| | 52 dB (at 62.5 MHz) |
| | 48 dB (at 100 MHz) |
| | 45 dB (at 155 MHz) |
| | 42 dB (at 200 MHz) |
| Power-summated near end crosstalk attenuation (PSNEXT) | 73 dB (with 1 MHz) |
| | 68 dB (at 4 MHz) |
| | 61 dB (at 10 MHz) |

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## Technical data

### Cable

| | |
|---|---|
| | 57 dB (at 16 MHz) |
| | 53 dB (at 31.25 MHz) |
| | 49 dB (at 62.5 MHz) |
| | 45 dB (at 100 MHz) |
| | 42 dB (at 155 MHz) |
| | 39 dB (at 200 MHz) |
| Attenuation | 1.5 dB (with 1 MHz) |
| | 3.3 dB (at 4 MHz) |
| | 5.3 dB (at 10 MHz) |
| | 6.9 dB (at 16 MHz) |
| | 9.9 dB (at 31.25 MHz) |
| | 14.5 dB (at 62.5 MHz) |
| | 18.8 dB (at 100 MHz) |
| | 23.6 dB (at 155 MHz) |
| | 27.3 dB (at 200 MHz) |
| Return loss (RL) | 25 dB (with 1 MHz) |
| | 25 dB (at 4 MHz) |
| | 28 dB (at 10 MHz) |
| | 28 dB (at 16 MHz) |
| | 27 dB (at 31.25 MHz) |
| | 26 dB (at 62.5 MHz) |
| | 25 dB (at 100 MHz) |
| | 25 dB (at 155 MHz) |
| | 23 dB (at 200 MHz) |
| Signal speed | 0.75 c |
| Signal runtime | 4.4 ns/m |
| Shield attenuation | 60 dB (up to 1000 MHz) |
| Coupling resistance | < 13.00 mΩ/m (f = 1 MHz) |
| | < 8.00 mΩ/m (f = 10 MHz ... 100 MHz) |
| Cable impedance | 100 Ω ±15 Ω (f = 0.5 MHz ... 3 MHz) |
| Nominal voltage, cable | 125 V |
| Test voltage Core/Core | 1000 V AC (50 Hz, 1 min.) |
| Test voltage Core/Shield | 1000 V AC (50 Hz, 1 min.) |
| Fire protection in rail vehicles | BS 6853 (Internal cable Ia, Ib, II/external cable Ia, Ib, II) |
| | DIN 5510-2 (Fire protection level 1, 2, 3, 4) |
| | EN 45545-2 (Risk level HL1 - HL3) |
| | EN 50306-4 |
| | NF F16-101 (Classification C/F1) |
| | NF F16-101 (Internal cable A1, A2, B/external cable A1, A2, B) |
| | NFPA 130 |

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## Technical data

### Cable

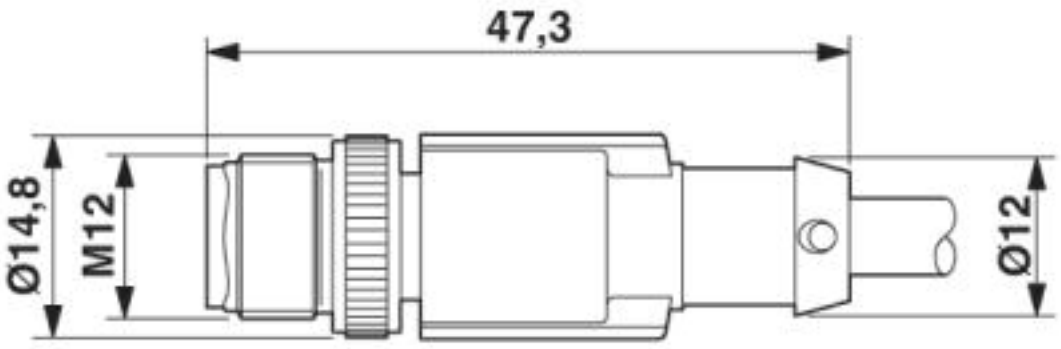
| | |
|---|---|
| | PN-K-02511 |
| | UIC 564-2 (Class A) |
| Flame resistance | according to EN 60332-1-2 |
| | according to EN 50266-2-5 |
| | according to ISO 14572 5.21 (UN ECE-R 118.01) |
| Halogen-free | According to EN 50267-2-1 |
| | according to EN 60684-2 |
| Resistance to oil | according to EN 60684-2, 72 h at 100 °C, IRM 902 |
| Other resistance | Resistant to fuel according to EN 60684-2, 72 h at 100 °C, IRM 903 |
| | Resistant to ozone according to EN 50306-4, 72 h at 40 °C, procedure B, volume concentration 200 x $10^{-6}$ |
| Concentration of fumes | EN 61034-2 |
| Ambient temperature (operation) | -40 °C ... 85 °C (cable, fixed installation) |
| | -25 °C ... 70 °C (cable, flexible installation) |

### Environmental Product Compliance

| | |
|---|---|
| China RoHS | Environmentally friendly use period: unlimited = EFUP-e |
| | No hazardous substances above threshold values |

## Drawings

Dimensional drawing




M12 SPEEDCON plug, straight, shielded

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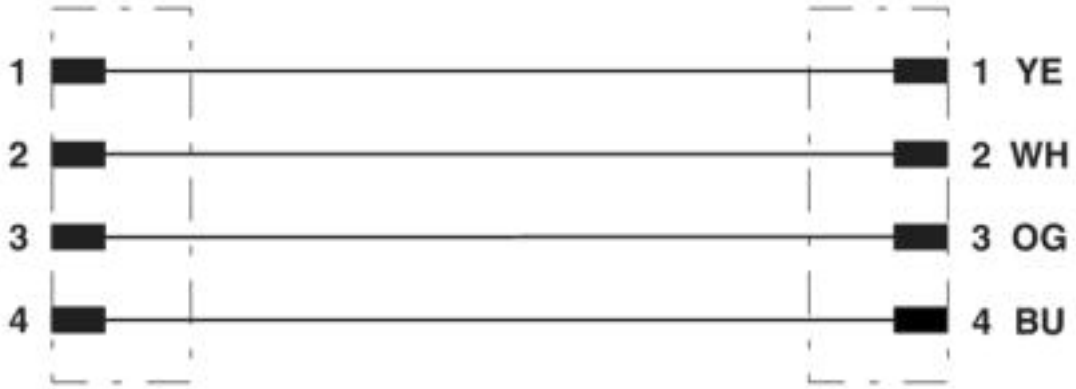
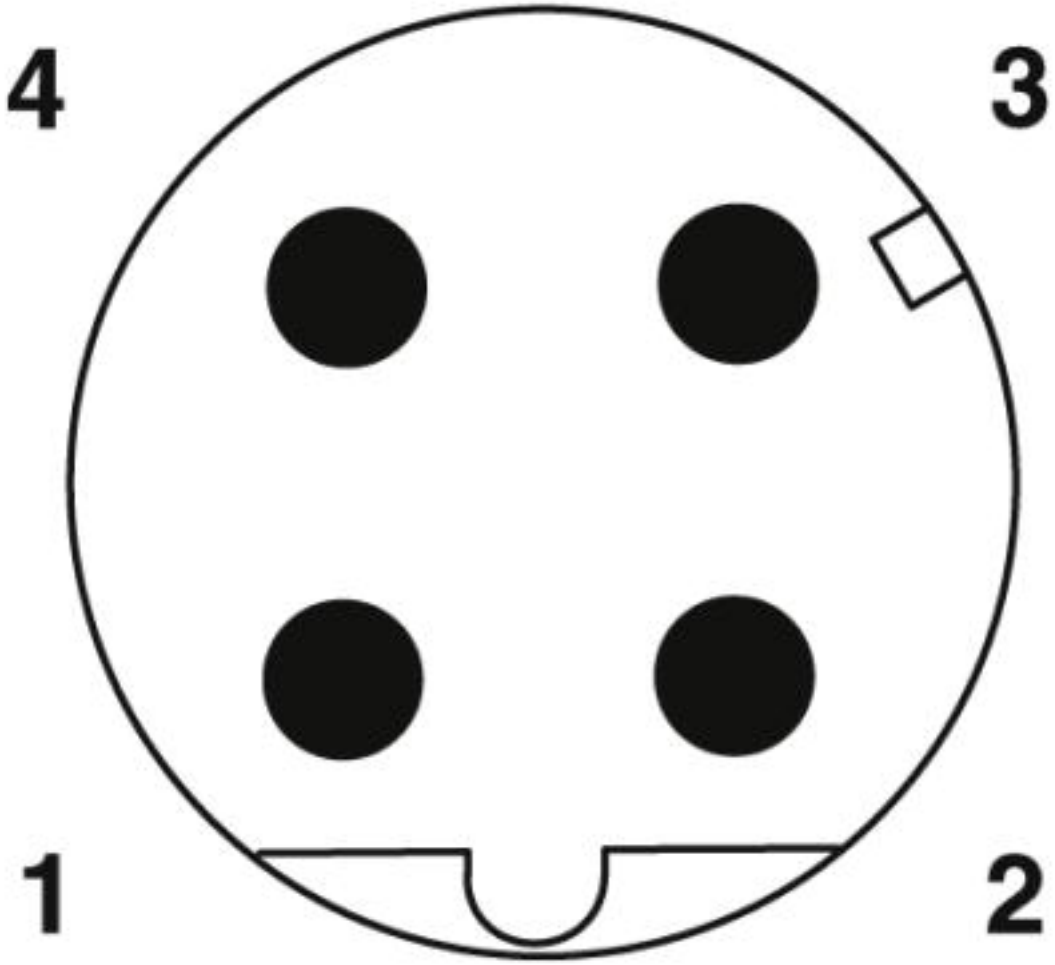
Circuit diagram




Contact assignment of the M12 plugs

Schematic diagram




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

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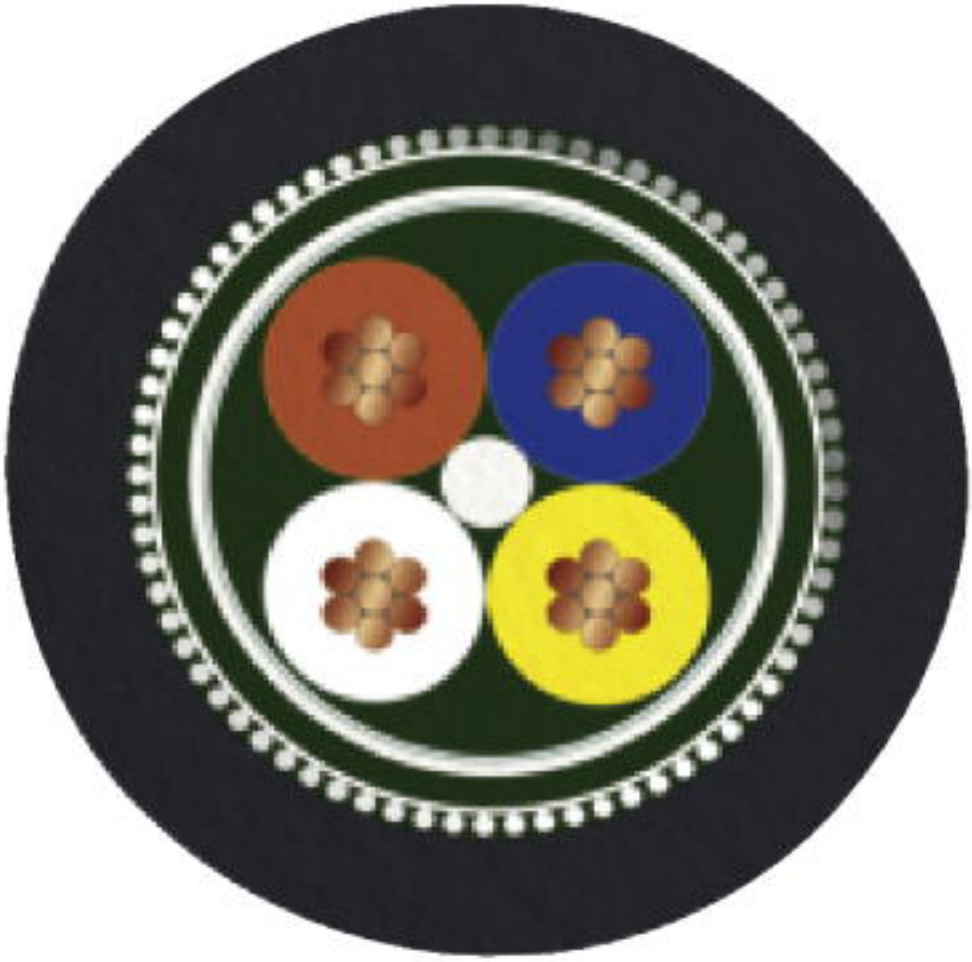
Cable cross section



PROFINET railway applications [939]