

Network cable - NBC-MSD/ 5,0-937/MSD SCO RAIL - 1407343

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

Your advantages

- ✓ Easy and safe: 100% electrically tested plug-in components
- ✓ Safety thanks to flame retardancy: PA 6.6 grip and radiation-cross-linked cables satisfy the most stringent requirements
- ✓ 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



Key Commercial Data

Packing unit	1 pc
GTIN	 4 046356 774598
GTIN	4046356774598
Weight per Piece (excluding packing)	360.000 g
Custom tariff number	85444290
Country of origin	Poland

Technical data

Dimensions

Length of cable	5 m
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Ambient conditions

Degree of protection	IP65
Ambient temperature (operation)	-40 °C ... 85 °C (Plug / socket)

Network cable - NBC-MSD/ 5,0-937/MSD SCO RAIL - 1407343

Technical data

General data

Note	Further products with variable cable type and variable cable length can be found in the accessories section
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
	Ethernet CAT5 (IEC 11801), 100 Mbps
Standards/regulations	M12 connector IEC 61076-2-101
	Shock, vibration EN 50155
Overvoltage category	II
Degree of pollution	3
Contact material	CuSn
Contact carrier material	PA 6.6
Contact surface material	Ni/Au
Degree of protection	IP65

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 6.6 (Contact carriers)
	PA 6.6 (Grip)
	Zinc die-cast, nickel-plated (Screw connection)
Standards/regulations material	PA 6.6: Fire protection in rail vehicles - requirement sets R22, R23, and R24 acc. to DIN EN 45545-2 (Risk level HL1 - HL3)
Shielded	yes
Insulation resistance	≥ 100 MΩ
Insertion/withdrawal cycles	≥ 100
Torque	0.4 Nm
Ambient temperature (operation)	-40 °C ... 85 °C
Shielded	yes
Outer sheath, material	PE-X
External sheath, color	black RAL 9005
Type type, plug side	Plug straight

Network cable - NBC-MSD/ 5,0-937/MSD SCO RAIL - 1407343

Technical data

Characteristics head 1

Type type, socket side	Plug, straight
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Characteristics head 2

Head type	Plug straight M12 SPEEDCON / IP65
No. of positions (pin connector pattern)	4
Coding	D (Data)
Color	black
	black
Material (component)	CuSn (Contact)
	Ni/Au (Contact surface)
	PA 6.6 (Contact carriers)
	PA 6.6 (Grip)
	Zinc die-cast, nickel-plated (Screw connection)
Standards/regulations material	PA 6.6: Fire protection in rail vehicles - requirement sets R22, R23, and R24 acc. to DIN EN 45545-2 (Risk level HL1 - HL3)
Shielded	yes
Insulation resistance	≥ 100 MΩ
Insertion/withdrawal cycles	≥ 100
Torque	0.4 Nm
Ambient temperature (operation)	-40 °C ... 85 °C

Standards and Regulations

Standards/specifications	M12 connector IEC 61076-2-101
	Shock, vibration EN 50155
Flammability rating according to UL 94	V0

Cable

Cable type	PROFINET RADOX® railway application CAT5
Cable type (abbreviation)	937
Signal type/category	PROFINET CAT5 (IEC 11801), 100 Mbps
	EtherCAT® CAT5 (IEC 11801), 100 Mbps
Cable structure	1x4xAWG22/7; SF/TQ
Conductor cross section	4x 0.34 mm ²
AWG signal line	22
Conductor structure signal line	7x 0.25 mm
Core diameter including insulation	approx. 1.5 mm
Wire colors	white-blue, orange-yellow
Overall twist	Star quad
Shielding	Plastic-coated aluminum foil, tinned copper braided shield

Network cable - NBC-MSD/ 5,0-937/MSD SCO RAIL - 1407343

Technical data

Cable

External sheath, color	black RAL 9005
Outer sheath thickness	approx. 1 mm
External cable diameter D	6.6 mm ±0.4 mm
Minimum bending radius, fixed installation	6 x D
Cable weight	70 kg/km
Outer sheath, material	PE-X
Material conductor insulation	Foamed PE
Conductor material	silver-plated Cu litz wires
Conductor resistance	≤ 54.4 Ω/km
Working capacitance	≤ 65 pF (core-core)
	≤ 100 pF (core-shield)
Wave impedance	100 Ω ±5 Ω (f = 100 MHz)
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)
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)
Attenuation	2 dB (with 1 MHz)
	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)
Return loss (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)
Signal speed	75 c
Shield attenuation	40 dB (30 MHz ≤ f ≤ 100 MHz)

Network cable - NBC-MSD/ 5,0-937/MSD SCO RAIL - 1407343

Technical data

Cable

Coupling resistance	200.00 mΩ/m (f ≤ 30 MHz)
Nominal voltage, cable	300 V AC
Test voltage, cable	2000 V AC (50 Hz, 5 minutes)
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)
Flame resistance	EN 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)
Halogen-free	According to EN 50267-2-1
Resistance to oil	according to IRM 902, 72 h at 100 °C
Other resistance	Resistance to fuels according to IRM 903, 168 h at 70 °C
Concentration of fumes	BS 6853 D.8.7
	EN 61034-2
	UL 1685, 12 (FT4)
Fume corrosiveness	EN 50267-2-2
Fume toxicity	BS 6853 B.1
	EN 50305, 9.2
Ambient temperature (operation)	-50 °C ... 90 °C (cable, fixed installation)
	-40 °C ... 90 °C (cable, flexible installation)
Ambient temperature (installation)	-25 °C ... 90 °C

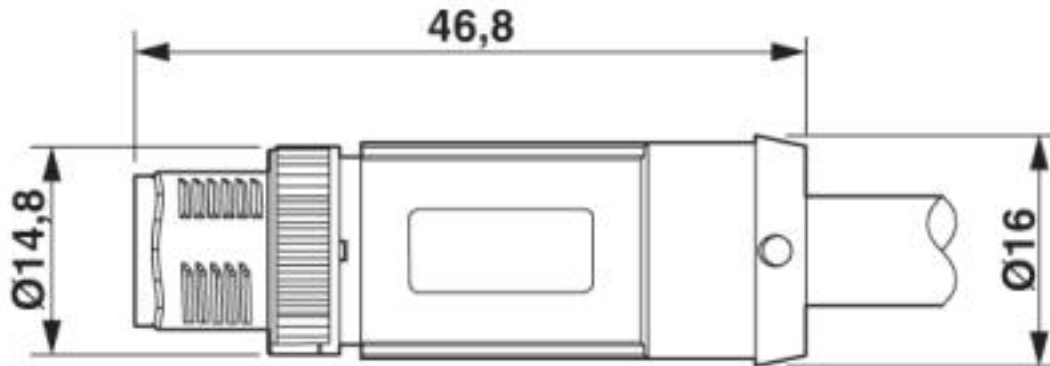
Environmental Product Compliance

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

Drawings

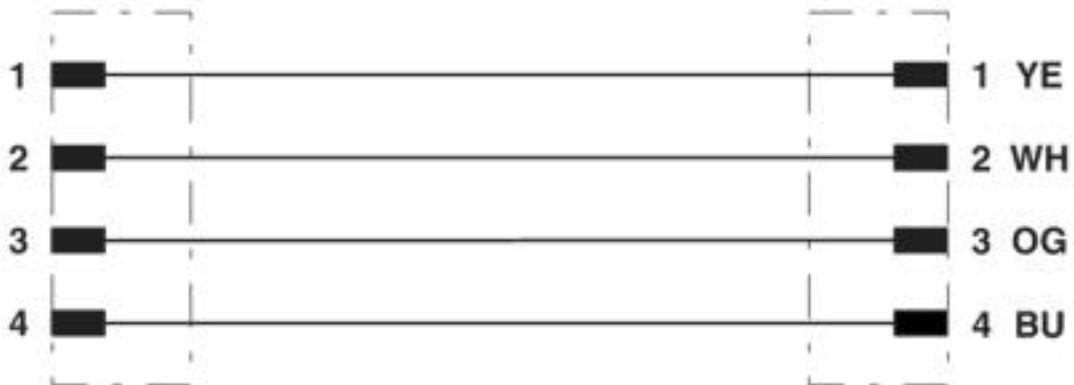
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Dimensional drawing



M12 SPEEDCON plug, straight, shielded

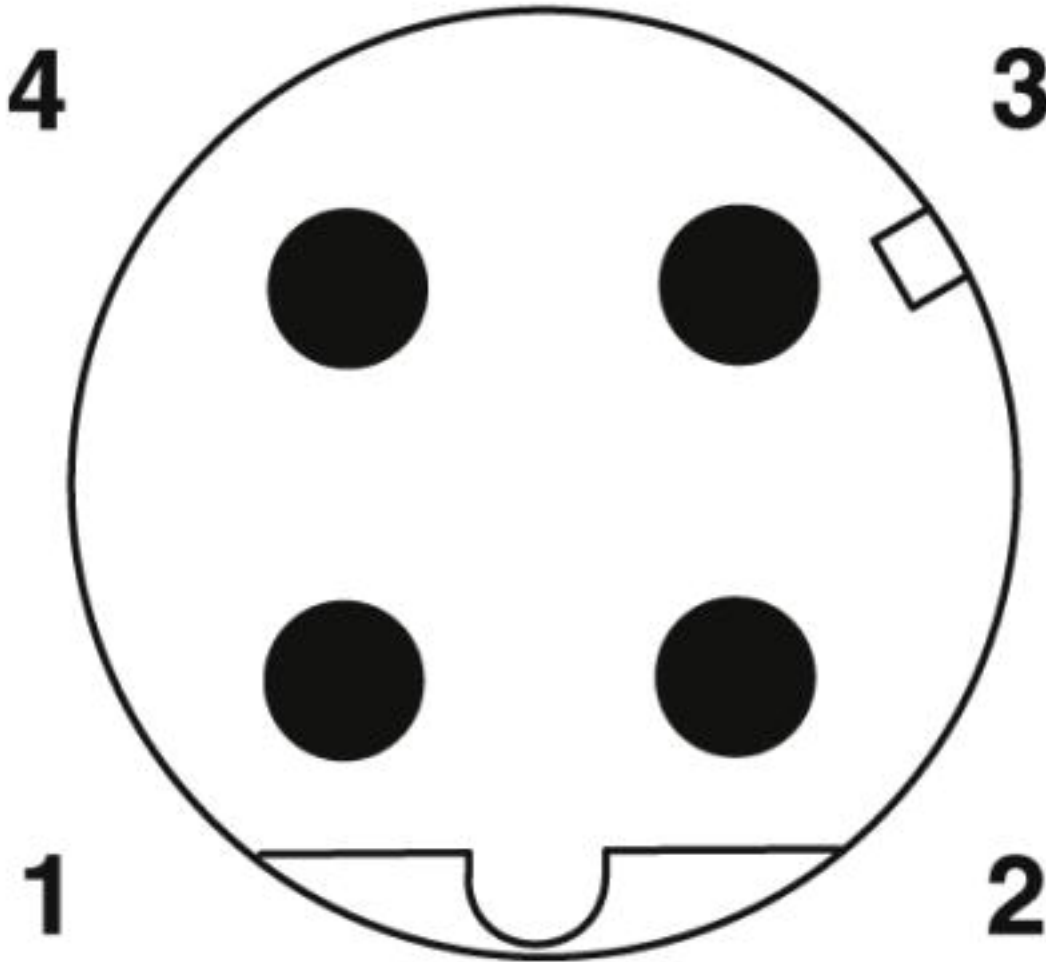
Circuit diagram



Contact assignment of the M12 plugs

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Schematic diagram



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

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Cable cross section



PROFINET RADOX® railway application CAT5 [937]

Classifications

eCl@ss

eCl@ss 4.0	27060300
eCl@ss 4.1	27060300
eCl@ss 5.0	27060300
eCl@ss 5.1	27060300
eCl@ss 6.0	27279200
eCl@ss 7.0	27279218
eCl@ss 8.0	27279218

Network cable - NBC-MSD/ 5,0-937/MSD SCO RAIL - 1407343

Classifications

eCl@ss

eCl@ss 9.0	27060308
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ETIM

ETIM 3.0	EC000830
ETIM 4.0	EC001855
ETIM 5.0	EC002599
ETIM 6.0	EC001262
ETIM 7.0	EC001262

UNSPSC

UNSPSC 6.01	31261501
UNSPSC 7.0901	31261501
UNSPSC 11	31261501
UNSPSC 12.01	31261501
UNSPSC 13.2	31251501
UNSPSC 18.0	26121604
UNSPSC 19.0	26121604
UNSPSC 20.0	26121604
UNSPSC 21.0	26121604

Accessories

Accessories

Conductor marking

Cable marker - WMTB HF (40X12)R YE - 0830408



Cable marker, Roll, yellow, unlabeled, can be labeled with: THERMOMARK ROLLMASTER 300/600, THERMOMARK X1.2, THERMOMARK ROLL X1, THERMOMARK ROLL 2.0, THERMOMARK ROLL, mounting type: Assembly with cable binders, cable diameter: ≥ 6 mm, lettering field size: 40 x 12 mm, Number of individual labels: 1000

Cable marker - WMTB HF (55X15)R YE - 0830410



Cable marker, Roll, yellow, unlabeled, can be labeled with: THERMOMARK ROLLMASTER 300/600, THERMOMARK X1.2, THERMOMARK ROLL X1, THERMOMARK ROLL 2.0, THERMOMARK ROLL, mounting type: Assembly with cable binders, cable diameter: ≥ 6 mm, lettering field size: 55 x 15 mm, Number of individual labels: 1000

Network cable - NBC-MSD/ 5,0-937/MSD SCO RAIL - 1407343

Accessories

Cable marker - WMTB HF (55X25)R YE - 0830412



Cable marker, Roll, yellow, unlabeled, can be labeled with: THERMOMARK ROLLMASTER 300/600, THERMOMARK X1.2, THERMOMARK ROLL X1, THERMOMARK ROLL 2.0, THERMOMARK ROLL, mounting type: Assembly with cable binders, cable diameter: ≥ 6 mm, lettering field size: 55 x 25 mm, Number of individual labels: 500

Conductor marking - UCT-WMCO 5,4 (23X8) - 0832105



Conductor marking, Sheet, white, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: clip on, cable diameter range: 4.7 ... 5.4 mm, lettering field size: 23 x 8 mm, Number of individual labels: 18

Conductor marking - UCT-WMCO 6,1 (23X8) - 0832106



Conductor marking, Sheet, white, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: clip on, cable diameter range: 5.4 ... 6.1 mm, lettering field size: 23 x 8 mm, Number of individual labels: 18

Conductor marking - UCT-WMCO 6,8 (23X8) - 0832107



Conductor marking, Sheet, white, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: clip on, cable diameter range: 6.1 ... 6.8 mm, lettering field size: 23 x 8 mm, Number of individual labels: 15

Conductor marking - UCT-WMCO 7,5 (23X8) - 0832108



Conductor marking, Sheet, white, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, THERMOMARK PRIME, THERMOMARK CARD 2.0, THERMOMARK CARD, mounting type: clip on, cable diameter range: 6.8 ... 7.5 mm, lettering field size: 23 x 8 mm, Number of individual labels: 15

Network cable - NBC-MSD/ 5,0-937/MSD SCO RAIL - 1407343

Accessories

Cable marker - WMTB-AL (40X15) - 0830524



Cable marker, Aluminum label, aluminum color, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, mounting type: Assembly with cable binders, cable diameter: > 4.6 mm, lettering field size: 40 x 15 mm

Cable marker - WMTB-AL (60X15) - 0830525



Cable marker, Aluminum label, aluminum color, unlabeled, can be labeled with: BLUEMARK ID COLOR, BLUEMARK ID, BLUEMARK CLED, mounting type: Assembly with cable binders, cable diameter: > 4.6 mm, lettering field size: 60 x 15 mm

Cable marker - LS-WMTB-AL (40X15) - 0831501



Cable marker, Aluminum label, aluminum color, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: Assembly with cable binders, cable diameter: > 4.6 mm, lettering field size: 40 x 15 mm, Number of individual labels: 16

Cable marker - LS-WMTB-AL (40X15) BK - 0831509



Cable marker, Aluminum label, black, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: Assembly with cable binders, cable diameter: > 4.6 mm, lettering field size: 40 x 15 mm, Number of individual labels: 16

Cable marker - LS-WMTB-AL (60X15) - 0831502



Cable marker, Aluminum label, aluminum color, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: Assembly with cable binders, cable diameter: > 4.6 mm, lettering field size: 60 x 15 mm, Number of individual labels: 16

Network cable - NBC-MSD/ 5,0-937/MSD SCO RAIL - 1407343

Accessories

Cable marker - LS-WMTB-AL (60X15) BK - 0831510

Cable marker, Aluminum label, black, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: Assembly with cable binders, cable diameter: > 4.6 mm, lettering field size: 60 x 15 mm, Number of individual labels: 16



Cable marker - LS-WMTB-AL (100X15) - 0831503

Cable marker, Aluminum label, aluminum color, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: Assembly with cable binders, cable diameter: > 4.6 mm, lettering field size: 100 x 15 mm, Number of individual labels: 8



Cable marker - LS-WMTB-AL (100X15) BK - 0831511

Cable marker, Aluminum label, black, unlabeled, can be labeled with: TOPMARK NEO, TOPMARK LASER, mounting type: Assembly with cable binders, cable diameter: > 4.6 mm, lettering field size: 100 x 15 mm, Number of individual labels: 8



Data cable preassembled

Network cable - NBC-MSD SCO RAIL/.../... - 1412178



Network cable, PROFINET CAT5 (100 Mbps), Ethernet CAT5 (100 Mbps), 4-position, Variable cable type, shielded, Plug straight M12 SPEEDCON / IP65, coding: D, on free cable end, cable length: Free input (0.2 ... 40.0 m), For railway applications

Network cable - NBC-MRD SCO RAIL/.../... - 1412179



Network cable, PROFINET CAT5 (100 Mbps), Ethernet CAT5 (100 Mbps), 4-position, Variable cable type, shielded, Plug angled M12 SPEEDCON / IP65, coding: D, on free cable end, cable length: Free input (0.2 ... 40.0 m), For railway applications

Network cable - NBC-MSD/ 5,0-937/MSD SCO RAIL - 1407343

Accessories

Network cable - NBC-MSD-MSD SCO RAIL/.../... - 1412177



Network cable, PROFINET CAT5 (100 Mbps), Ethernet CAT5 (100 Mbps), 4-position, Variable cable type, shielded, Plug straight M12 SPEEDCON / IP65, coding: D, on Plug straight M12 SPEEDCON / IP65, coding: D, cable length: Free input (0.2 ... 40.0 m), For railway applications

Network cable - NBC-FSD SCO RAIL/.../... - 1412181



Network cable, PROFINET CAT5 (100 Mbps), Ethernet CAT5 (100 Mbps), 4-position, Variable cable type, shielded, free cable end, on Socket straight M12 SPEEDCON / IP65, coding: D, cable length: Free input (0.2 ... 40.0 m), For railway applications

Network cable - NBC-FRD SCO RAIL/.../... - 1412182



Network cable, PROFINET CAT5 (100 Mbps), Ethernet CAT5 (100 Mbps), 4-position, Variable cable type, shielded, free cable end, on Socket angled M12 SPEEDCON / IP65, coding: D, cable length: Free input (0.2 ... 40.0 m), For railway applications

Network cable - NBC-MSD-FSD SCO RAIL/.../... - 1412180



Network cable, PROFINET CAT5 (100 Mbps), Ethernet CAT5 (100 Mbps), 4-position, Variable cable type, shielded, Plug straight M12 SPEEDCON / IP65, coding: D, on Socket straight M12 SPEEDCON / IP65, coding: D, cable length: Free input (0.2 ... 40.0 m), For railway applications

Network cable - NBC-MSD-QCMS SCO RAIL/.../... - 1412183



Network cable, PROFINET CAT5 (100 Mbps), Ethernet CAT5 (100 Mbps), 4-position, Variable cable type, shielded, Plug straight M12 SPEEDCON / IP65, coding: D, on EMC pin insert straight / IP20, cable length: Free input (0.2 ... 40.0 m), For railway applications

Network cable - NBC-MSD/ 5,0-937/MSD SCO RAIL - 1407343

Accessories

Network cable - NBC-MSD-QCFS SCO RAIL/.../... - 1412184



Network cable, PROFINET CAT5 (100 Mbps), Ethernet CAT5 (100 Mbps), 4-position, Variable cable type, shielded, Plug straight M12 SPEEDCON / IP65, coding: D, on EMC socket insert straight / IP20, cable length: Free input (0.2 ... 40.0 m), For railway applications

Network cable - NBC-QCMS RAIL/.../... - 1412186



Network cable, PROFINET CAT5 (100 Mbps), Ethernet CAT5 (100 Mbps), 4-position, Variable cable type, shielded, EMC pin insert straight / IP20, on free cable end, cable length: Free input (0.2 ... 40.0 m), For railway applications

Network cable - NBC-QCFS RAIL/.../... - 1412185



Network cable, PROFINET CAT5 (100 Mbps), Ethernet CAT5 (100 Mbps), 4-position, Variable cable type, shielded, free cable end, on EMC socket insert straight / IP20, cable length: Free input (0.2 ... 40.0 m), For railway applications

Marker carrier cable

Cable marker carrier - KMK HP (25X6) - 0830720



Cable marker carrier, transparent, unlabeled, mounting type: Assembly with cable binders, cable diameter: ≥ 6 mm, lettering field size: 25 mm x 6 mm

Cable marker carrier - KMK HP (29X8) - 0830721



Cable marker carrier, transparent, unlabeled, mounting type: Assembly with cable binders, cable diameter: ≥ 6 mm, lettering field size: 29 x 8 mm

Network cable - NBC-MSD/ 5,0-937/MSD SCO RAIL - 1407343

Accessories

Marker pen

Marker pen - B-STIFT - 1051993



Marker pen, for manual labeling of unprinted Zack strips, smear-proof and waterproof, line thickness 0.5 mm

Protective cap

Sealing cap - PROT-M12 FS-PA-CHAIN - 1430873

M12 sealing cap made of plastic with fixing band, for sensor cables, for free M12 plugs



Safety locking

Locking clip - SAC-M12-EXCLIP-M - 1558988



Locking clip for the pin side of sensor/actuator cables with M12 connector and M12 connectors for assembly, for knurl diameter: 15 mm or for Allen key with a wrench size of 14 mm, prevents the disconnection of plug-in connections without tools

Screwdriver tools

Adapter insert - TSD-M SAC-BIT ADAPTER - 1212600



Adapter bit for TSD-M...torque tools, E6.3-1/4" drive with 4 mm hexagon to accommodate SAC bits

Network cable - NBC-MSD/ 5,0-937/MSD SCO RAIL - 1407343

Accessories

Tool - SAC BIT M12-D15 - 1208432



Nut for assembling sensor/actuator cables with M12 connector and M12 connectors for assembly, with a knurl diameter of 15 mm, for 4 mm hexagonal drive

Torque tool

Torque screwdriver - TSD 04 SAC - 1208429



Torque screwdriver, with preset torque of 0.4 Nm and 4 mm hexagonal drive for M12 connectors

Torque screwdriver - TSD-M 1,2NM - 1212224



Torque screw driver, accuracy as per EN ISO 6789 standard, adjustable from 0.3 - 1.2 Nm
