FL MC EF 1300 SM SC - FO converters

2902856

https://www.phoenixcontact.com/us/products/2902856

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FO converter with SC duplex fiber optic connection (1300 nm), for converting 10/100Base-T(X) to single mode fiberglass (9/125 µm). Auto negotiation and auto MDI(X) function. Comprehensive link diagnostics. DIN-rail mountable, 18 ... 30 V DC supply.

Product description

Optical transmission with FO technology provides superior immunity to interference at maximum transmission ranges without restricting the transmission bandwidth.

Your advantages

- Transmission ranges up to 36 km
- Auto negotiation
- Auto MDI/MDI-X switch-over
- Link fault pass through (LFPT) and far end fault (FEF) functions for easy connection monitoring
- 10/100 Mbps
- Shipbuilding approval in accordance with DNV GL

Commercial data

Item number	2902856
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DN06
Product key	DNC311
Catalog page	Page 351 (C-6-2019)
GTIN	4046356689212
Weight per piece (including packing)	171.8 g
Weight per piece (excluding packing)	174.4 g
Customs tariff number	85176200
Country of origin	US

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Technical data

Notes

Note on application

Note on application	Only for industrial use

Utilization restriction

EMC note	EMC: class A product, see manufacturer's declaration in the download area

Utilization restriction

CCCex note	Use in potentially explosive areas is not permitted in China.

Product properties

Product type	Media converter
MTTF	1400 Years (SN 29500 standard, temperature 25°C, operating cycle 21%)
	599 Years (SN 29500 standard, temperature 40°C, operating cycle 34.25%)
	101 Years (SN 29500 standard, temperature 40°C, operating cycle 100%)
MTBF	284 Years (Telcordia standard, 25°C temperature, 21% operating cycle (5 days a week, 8 hours a day))
	74 Years (Telcordia standard, 40°C temperature, 34.25% operating cycle (5 days a week, 12 hours a day))
Signal delay	± 1.3 µs (Store and Forward mode, 10/100 Mbps, depending on the frame size)

Data management status

Article revision	11

System properties

Functionality

Basic functions	Store-and-forward media converter

Electrical properties

Electrical isolation	according to IEEE 802.3
	VCC // FE // Ethernet
Maximum power dissipation for nominal condition	2.4 W
Test voltage data interface/power supply	0.5 kV_{rms} (50 Hz, 1 min.)

Supply

Supply voltage range	18 V DC ... 30 V DC (Screw connection)
	18 V DC ... 30 V DC (as an alternative or redundant, via backplane bus contact and system current supply)
Typical current consumption	< 100 mA (24 V DC)
Protective circuit	Reverse polarity protection

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Connection data

Supply

Connection method	Plug-in screw terminal block (COMBICON), redundancy possible
Single conductor/terminal point, rigid	0.2 mm² ... 2.5 mm²
Single-wire/terminal point, flexible	0.2 mm² ... 2.5 mm²
Conductor cross section, flexible [AWG]	24 ... 14
Stripping length	7.00 mm
Tightening torque	0.56 Nm ... 0.79 Nm

Interfaces

Signal	Ethernet
Basic functions	Store-and-forward media converter

Data: optical FO

Transmit capacity, minimum	≥ -15 dBm ((9/125 µm) dynamic in link mode (average))
Transmit capacity, maximum	≤ -8 dBm ((9/125 µm) dynamic in link mode (average))
Transmission length incl. 3 dB system reserve	36 km (F-E 9/125 0.36 dB/km)
	32 km (F-E 9/125 0.4 dB/km)
	26 km (F-E 9/125 0.5 dB/km)
Connection method	SC duplex
Wavelength	1300 nm
Minimum receiver sensitivity	-31 dBm (dynamic in link mode (average))
Maximum receiver sensitivity	-7 dBm (dynamic in link mode (average))
Transmission medium	Single-mode fiberglass

Data: Ethernet interface, 10/100Base-T(X) in accordance with IEEE 802.3

Transmission speed	10/100 Mbps
Connection method	RJ45 jack, shielded
No. of channels	1
Transmission length	100 m (shielded twisted pair)
Transmission medium	Copper
Signal LEDs	Activity, link status, 10/100 Mbps
Auto-negotiation modes	Auto
Link through	Link fault pass through
MDI-/MDI-X switchover	Auto-MDI(X)

Dimensions

Dimensional drawing	
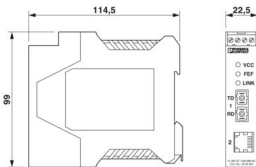
Width	22.5 mm
Height	99 mm
Depth	114.5 mm

Material specifications

Color (Housing)	green (RAL 6021)
Material (Housing)	PA 6.6-FR

Cable/line

FO cable

Fiber types	50/125 µm
	62.5/125 µm
	Fiberglass

Environmental and real-life conditions

Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 65 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Altitude	≤ 5000 m (For restrictions, see the manufacturer's declaration for altitude operation)
	≤ 2000 m (in acc. with UL)
Permissible humidity (operation)	5 % ... 95 % (non-condensing)
Permissible humidity (storage/transport)	5 % ... 95 % (non-condensing)

Approvals

CE

Certificate	CE-compliant

ATEX

Identification	⟨Ex⟩ II 3 G Ex nA IIC T4 Gc X
Note	Please follow the special installation instructions in the documentation!

UL, USA/Canada

Identification	508 Listed
	Class I, Zone 2, AEx nA IIC T4
	Class I, Zone 2, Ex nA IIC T4 Gc X
	Class I, Div. 2, Groups A, B, C, D

Corrosive gas test

Identification	ISA-S71.04-1985 G3 Harsh Group A

Shipbuilding

Identification	DNV GL

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

EMC data

Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU

Electrostatic discharge	
Standards/regulations	EN 61000-4-2

Electrostatic discharge	
Contact discharge	± 6 kV (Test Level 3)
Discharge in air	± 8 kV (Test Level 3)
Indirect discharge	± 6 kV
Comments	Criterion B

Electromagnetic HF field	
Standards/regulations	EN 61000-4-3

Electromagnetic HF field	
Frequency range	80 MHz ... 3 GHz (Test Level 3)
Field intensity	10 V/m
Comments	Criterion A

Fast transients (burst)	
Standards/regulations	EN 61000-4-4

Fast transients (burst)	
Input	± 2 kV (Test Level 3)
Signal	± 2 kV (Test Level 3)
Comments	Criterion B

Surge current load (surge)	
Standards/regulations	EN 61000-4-5

Surge current load (surge)	
Input	± 0.5 kV (DC supply)
Signal	± 1 kV (Data line, asymmetrical)
Comments	Criterion B

Conducted interference	
Standards/regulations	EN 61000-4-6

Conducted interference

Frequency range	0.15 MHz ... 80 MHz
Comments	Criterion A
Voltage	10 V

Emitted interference

Standards/regulations	EN 55032
Comments	Class A, industrial applications

Criteria

Criterion A	Normal operating behavior within the specified limits.
Criterion B	Temporary impairment to operational behavior that is corrected by the device itself.

Standards and regulations

Free from substances that could impair the application of coating	in accordance with VW-AUDI-Seat central standard P-VW 3.10.7 57 65 0
Electrical isolation	according to IEEE 802.3

Mounting

Mounting type	DIN rail mounting

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Drawings

Block diagram
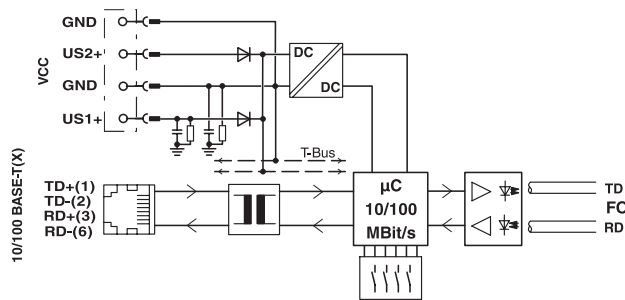
Basic circuit diagram

Dimensional drawing
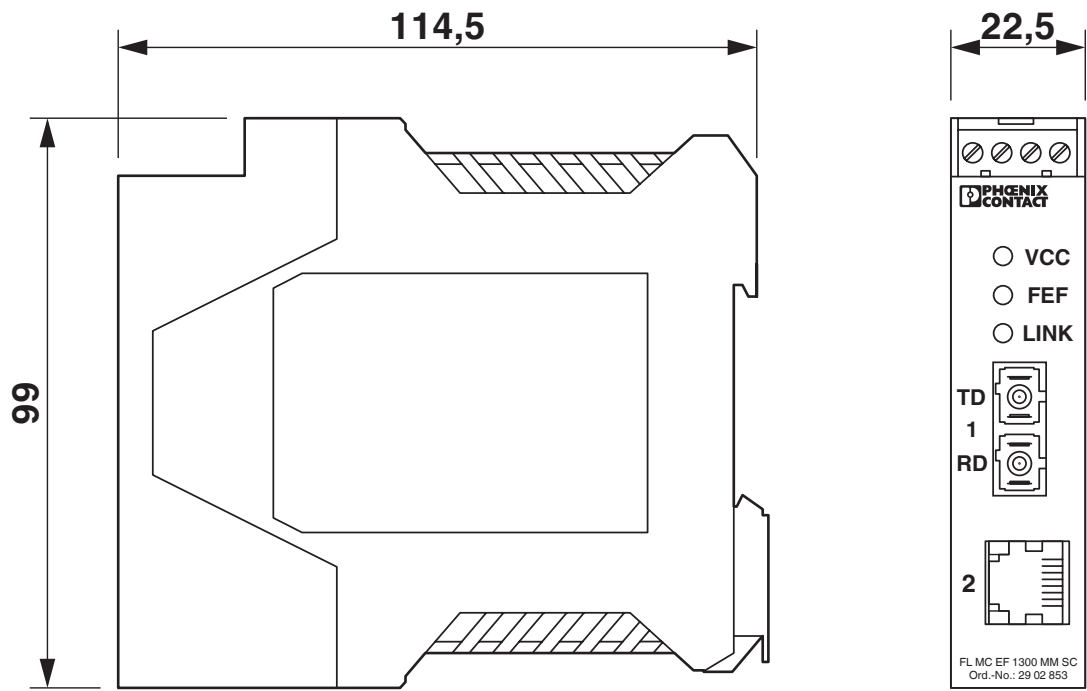
Slim design

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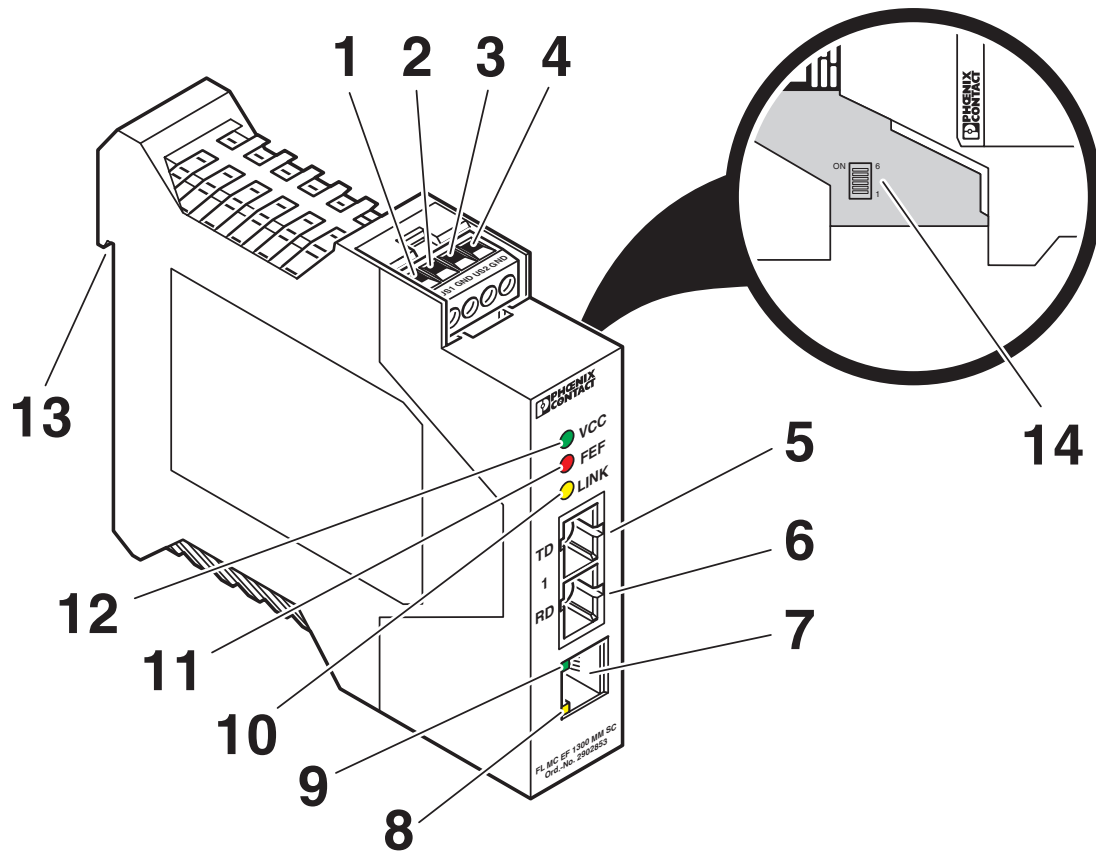
Schematic diagram

Function elements

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Schematic diagram

LED	permanent	flashing
GN - VCC	Device ON	
RD - FEF	Far End Fault	
YE - LINK	Link FO	Activity FO
GN - RJ45	Full Duplex	
GN/YE - RJ45	100/10 MBit/s	Activity CU

DIP	ON	OFF (DEFAULT)
6	Local Link	Link Pass Through
5	not used	not used
4	Pass Pause Frame	Drop Pause Frame
3	Half Duplex	Full Duplex
2	10 MBit/s	100 M
1	Fixed Data Rate	

FL MC EF 1300

ON ← 6
1

ON ← 6
1
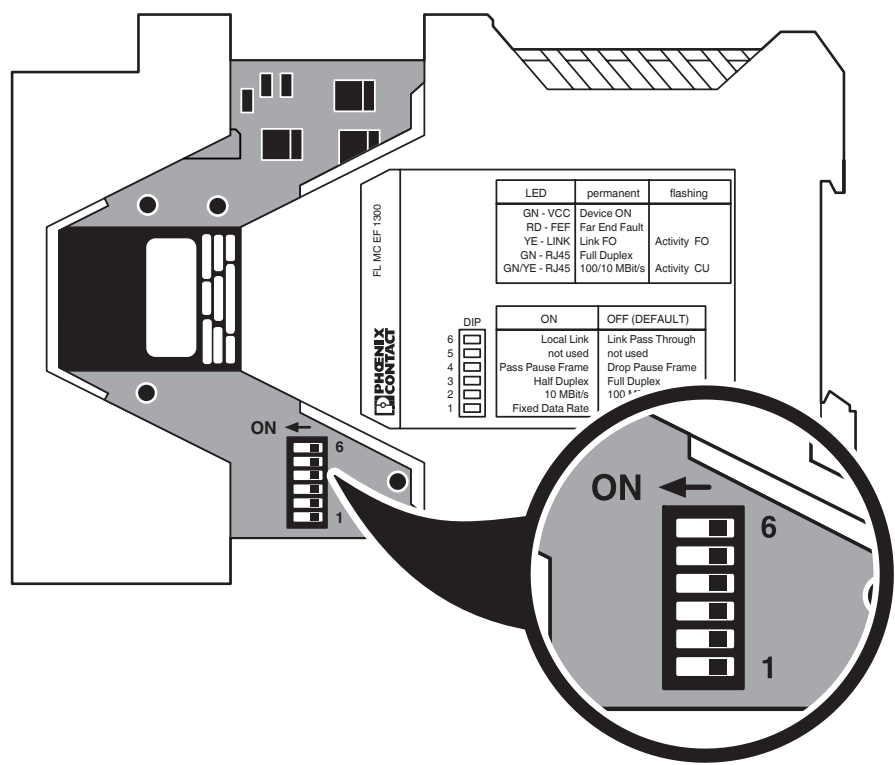
DIP switches

Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/us/products/2902856

EAC
Approval ID: RU*DE*08.B.00731/19

DNV GL
Approval ID: TAA00001KR

UL Listed
Approval ID: E238705

cUL Listed
Approval ID: E238705

cUL Listed
Approval ID: E199827

UL Listed
Approval ID: E199827

cULus Listed

cULus Listed

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Classifications

ECLASS

ECLASS-11.0	19170411
ECLASS-12.0	19170411
ECLASS-13.0	19170411

ETIM

ETIM 9.0	EC001467

UNSPSC

UNSPSC 21.0	43201500

Environmental product compliance

EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	7(a), 7(c)-I

China RoHS

Environment friendly use period (EFUP)	EFUP-50
	An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required.

EU REACH SVHC

REACH candidate substance (CAS No.)	Lead(CAS: 7439-92-1)
SCIP	440a3d4c-ab01-466b-9d3b-4e4f7baac025

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Accessories

FL PLUG RJ45 GR/2 - RJ45 connector

2744856

https://www.phoenixcontact.com/us/products/2744856

RJ45 connector, design: RJ45, degree of protection: IP20, number of positions: 8, 1 Gbps, CAT5 (IEC 11801:2002), material: Plastic, connection method: Crimp connection, connection cross section: AWG 26- 24, cable outlet: straight, color: gray, Ethernet

FL PLUG RJ45 GN/2 - RJ45 connector

2744571

https://www.phoenixcontact.com/us/products/2744571

RJ45 connector, design: RJ45, degree of protection: IP20, number of positions: 8, 1 Gbps, CAT5 (IEC 11801:2002), material: Plastic, connection method: Crimp connection, connection cross section: AWG 26- 24, cable outlet: straight, color: green, Ethernet

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FL CAT5 HEAVY - Data cable

2744814

https://www.phoenixcontact.com/us/products/2744814

CAT5-SF/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable, 2 x 2 x 0.22 mm^2, solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.75 mm ± 0.15 mm diameter

FL CAT5 FLEX - Installation cable

2744830

https://www.phoenixcontact.com/us/products/2744830

By the meter, Installation cable, Ethernet CAT5 (100 Mbps), shielded, PUR halogen-free, water blue RAL 5021, 4-wire (2x2xAWG26/7, SF/UTP), color single wire: white/orange-orange, white/green-green, cable length: Free entry (1.0 ... 1000.0 m)

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FL CRIMPTOOL - Assembly tool

2744869

https://www.phoenixcontact.com/us/products/2744869

Crimping pliers, for assembling the RJ45 plugs FL PLUG RJ45..., for assembly on site

ME 22,5 TBUS 1,5/ 5-ST-3,81 GN - DIN rail bus connectors

2707437

https://www.phoenixcontact.com/us/products/2707437

DIN rail connector, color: green, nominal current: 8 A (parallel contacts), rated voltage (III/2): 125 V, number of positions: 5, product range: TBUS5-22,5.., pitch: 3.81 mm, mounting: DIN rail mounting, locking: without, mounting: without, type of packaging: packed in cardboard, Item with gold-plated contacts, bus connectors for connecting with electronics housings, 5 parallel contacts
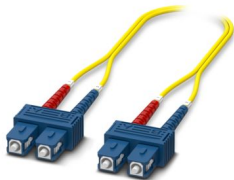
FL MC EF 1300 SM SC - FO converters
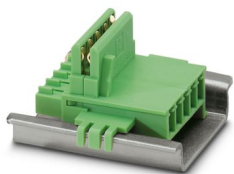
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QUINT4-SYS-PS/1AC/24DC/2.5/SC - Power supply unit

2904614

https://www.phoenixcontact.com/us/products/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

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN - DIN rail bus connectors

2709561

https://www.phoenixcontact.com/us/products/2709561
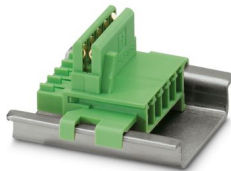
DIN rail connector for DIN rail mounting. Universal for TBUS housing. Gold-plated contacts, 5-pos.

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ME 17,5 TBUS 1,5/ 5-ST-3,81 KMGY - DIN rail bus connectors

2713645

https://www.phoenixcontact.com/us/products/2713645
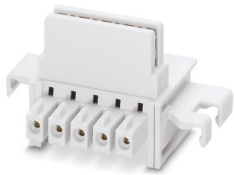
DIN rail connector, color: light gray, nominal current: 8 A (parallel contacts), rated voltage (III/2): 125 V, number of positions: 5, product range: TBUS5-17,5.., pitch: 3.81 mm, mounting: DIN rail mounting, locking: without, mounting: without, type of packaging: packed in cardboard, Item with gold-plated contacts, bus connectors for connecting with electronics housings, 5 parallel contacts

FOC-SC:PA-SC:PA-OS2:D01/1 - FO patch cable

1115550

https://www.phoenixcontact.com/us/products/1115550

Single-mode OS2 duplex jumper, SC-SC, UPC polishing, length 1 m

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FOC-SC:PA-SC:PA-OS2:D01/2 - FO patch cable

1115548

https://www.phoenixcontact.com/us/products/1115548

Single-mode OS2 duplex jumper, SC-SC, UPC polishing, length 2 m

FOC-ST:PA-SC:PA-OS2:D01/1 - FO patch cable
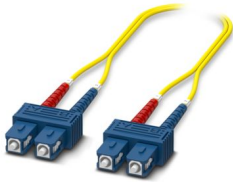
1115582

https://www.phoenixcontact.com/us/products/1115582

Single-mode OS2 duplex jumper, ST-SC, UPC polishing, length 1 m

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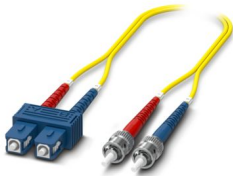
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https://www.phoenixcontact.com/us/products/2902856

FOC-ST:PA-SC:PA-OS2:D01/2 - FO patch cable

1115581

https://www.phoenixcontact.com/us/products/1115581

Single-mode OS2 duplex jumper, ST-SC, UPC polishing, length 2 m

FOC-LC:PA-SC:PA-OS2:D01/1 - FO patch cable
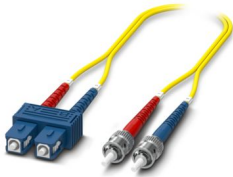
1115618

https://www.phoenixcontact.com/us/products/1115618

Single-mode OS2 duplex jumper, LC-SC, UPC polishing, length 1 m
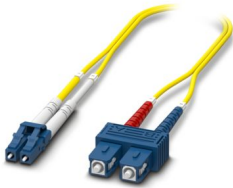
FL MC EF 1300 SM SC - FO converters
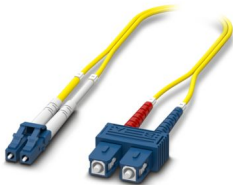
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FOC-LC:PA-SC:PA-OS2:D01/2 - FO patch cable

1115617

https://www.phoenixcontact.com/us/products/1115617

Single-mode OS2 duplex jumper, LC-SC, UPC polishing, length 2 m

VS-08-RJ45-5-Q/IP20 - RJ45 connector

1656725

https://www.phoenixcontact.com/us/products/1656725

RJ45 connector, design: RJ45, degree of protection: IP20, number of positions: 8, 1 Gbps, CAT5, material: Plastic, connection method: Insulation displacement connection, connection cross section: AWG 26- 23, cable outlet: straight, color: traffic grey A RAL 7042, Ethernet

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VS-08-RJ45-5-Q/IP20 BK - RJ45 connector

1658008

https://www.phoenixcontact.com/us/products/1658008

RJ45 connector, design: RJ45, degree of protection: IP20, number of positions: 8, 1 Gbps, CAT5, material: Plastic, connection method: Insulation displacement connection, connection cross section: AWG 26- 23, cable outlet: straight, color: black, Ethernet

FL CAT5 PATCH 0,5 - Patch cable

2832263

https://www.phoenixcontact.com/us/products/2832263

Patch cable, CAT5, assembled, 0.5 m

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FL CAT5 PATCH 1,0 - Patch cable

2832276

https://www.phoenixcontact.com/us/products/2832276

Patch cable, CAT5, assembled, 1 m

FL CAT5 PATCH 2,0 - Patch cable

2832289

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Patch cable, CAT5, assembled, 2 m

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FL CAT5 PATCH 3,0 - Patch cable

2832292

https://www.phoenixcontact.com/us/products/2832292

Patch cable, CAT5, assembled, 3 m

NBC-R4AC-R4AC-IE8A/.../... - Patch cable

1411854

https://www.phoenixcontact.com/us/products/1411854
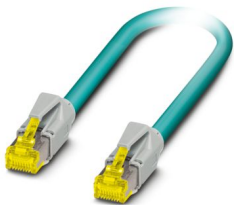
Patch cable, degree of protection: IP20, number of positions: 8, 10 Gbps, $CAT6_A$, cable outlet: straight, Ethernet
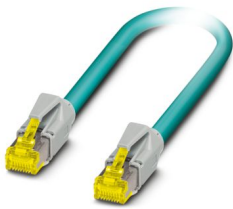
NBC-R4AC/10G-R4AC/10G-94F/2,0 - Patch cable

1408360

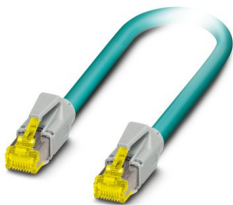https://www.phoenixcontact.com/us/products/1408360

Patch cable, $CAT6_A$, 4-pair, shielded, connection not crossed (line), assembled at both ends with RJ45/IP20 connectors, outer sheath material: PUR, length: 2.0 m

NBC-R4AC/10G-R4AC/10G-94F/3,0 - Patch cable

1408365

https://www.phoenixcontact.com/us/products/1408365

Patch cable, $CAT6_A$, 4-pair, shielded, connection not crossed (line), assembled at both ends with RJ45/IP20 connectors, outer sheath material: PUR, length: 3.0 m

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FL DIN RA - DIN rail adapter

2891053

https://www.phoenixcontact.com/us/products/2891053

The FL DIN RA is installed in a standard, 19-inch rack (EIA-310-D, IEC 60297-3-100) to allow DIN rail mounted equipment to be rack mounted.

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