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# FO converters - FL MC EF 1300 SM SC - 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 Features

☑ Transmission ranges up to 36 km

☑ Auto negotiation

☑ Auto MDI/MDI-X switch-over

☑ Link fault pass through (LFP) and far end fault (FEF) functions for easy connection monitoring

☑ Data rates 10/100 Mbps

**Ethernet   PROFINET   Modbus**

## Key commercial data

| Packing unit | 1 PCE |
|---|---|
| Weight per Piece (excluding packing) | 180.0 GRM |
| Custom tariff number | 85176200 |
| Country of origin | Germany |

## Technical data

### Note:

| Utilization restriction | EMC: class A product, see manufacturer's declaration in the download area |
|---|---|

### Dimensions

| Width | 22.5 mm |
|---|---|
| Height | 99 mm |
| Depth | 114.5 mm |

### Ambient conditions

| Ambient temperature (operation) | -40 °C ... 65 °C |
|---|---|
| | -25 °C ... 55 °C (With UL approval) |

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## Technical data

### Ambient conditions

| | |
|---|---|
| Ambient temperature (storage/transport) | -40 °C ... 85 °C |
| Permissible humidity (operation) | 30 % ... 95 % (no condensation) |
| Permissible humidity (storage/transport) | 30 % ... 95 % (no condensation) |
| Altitude | 5000 m (For restrictions see manufacturer's declaration) |
| | 2000 m (With UL approval) |
| Degree of protection | IP20 |

### General

| | |
|---|---|
| Electrical isolation | according to IEEE 802.3 |
| | (VCC // FE // Ethernet) |
| Test voltage data interface/power supply | 1.5 $kV_{rms}$ (50 Hz, 1 min.) |
| Standards/regulations | EN 60950-1 |
| Electromagnetic compatibility | Conformance with EMC Directive 2004/108/EC |
| Net weight | 120 g |
| Housing material | PA 6.6-FR |
| Color | green |
| 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)) |
| MTTF | 1400 Years (SN 29500 standard, temperature 25°C, operating cycle 21% (5 days a week, 8 hours a day)) |
| | 599 Years (SN 29500 standard, temperature 40°C, operating cycle 34.25% (5 days a week, 12 hours a day)) |
| | 101 Years (SN 29500 standard, temperature 40°C, operating cycle 100% (7 days a week, 24 hours a day)) |
| Conformance | CE-compliant |
| ATEX | # II 3 G Ex nA IIC T4 Gc X |
| UL, USA / Canada | cULus listed UL 508 |
| | 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 |

### Power 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 | Protection against polarity reversal |
| Connection method | Plug-in screw terminal block (COMBICON), redundancy possible |

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## Technical data

### Power supply

| | |
|---|---|
| Conductor cross section stranded max. | 2.50 mm² |
| Conductor cross section stranded min. | 0.20 mm² |
| Conductor cross section solid max. | 2.50 mm² |
| Conductor cross section solid min. | 0.20 mm² |
| Max. AWG conductor cross section, stranded | 14 |
| Min. AWG conductor cross section, stranded | 24 |
| Conductor cross section AWG/kcmil max | 14 |
| Conductor cross section AWG/kcmil min. | 24 |

### Serial interface

| | |
|---|---|
| Interface 1 | Ethernet interface, 10/100BASE-T(X) in acc. with IEEE 802.3u |
| Connection method | RJ45 socket, shielded |
| Transmission medium | Copper |
| Transmission length | 100 m (twisted pair, shielded) |
| Conductor cross section solid min. | 0.2 mm² |
| Conductor cross section solid max. | 2.5 mm² |
| Conductor cross section stranded min. | 0.2 mm² |
| Conductor cross section stranded max. | 2.5 mm² |
| Conductor cross section AWG/kcmil min. | 24 |
| Conductor cross section AWG/kcmil max | 14 |
| Auto-negotiation modes | Auto |
| Link through | Link fault pass through |
| Basic functions | Store-and-forward media converter |
| MDI-/MDI-X switchover | Auto-MDI(X) |
| Signal LEDs | Activity, link status, 10/100 Mbps |

### Optical interface FO

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

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## Classifications

### eCl@ss

| eCl@ss 4.0 | 27230207 |
|---|---|
| eCl@ss 4.1 | 27230207 |
| eCl@ss 5.0 | 27230207 |
| eCl@ss 5.1 | 27230207 |
| eCl@ss 6.0 | 27230207 |
| eCl@ss 7.0 | 27230207 |
| eCl@ss 8.0 | 27230207 |

### ETIM

| ETIM 3.0 | EC000310 |
|---|---|
| ETIM 4.0 | EC000310 |
| ETIM 5.0 | EC001467 |

### UNSPSC

| UNSPSC 6.01 | 30211506 |
|---|---|
| UNSPSC 7.0901 | 39121008 |
| UNSPSC 11 | 39121008 |
| UNSPSC 12.01 | 39121008 |
| UNSPSC 13.2 | 39121008 |

## Approvals

### Approvals

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Approvals

UL Listed / cUL Listed / cULus Listed

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Ex Approvals

ATEX / UL Listed / cUL Listed / cULus Listed

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Approvals submitted

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Approval details

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## Approvals

UL Listed

cUL Listed
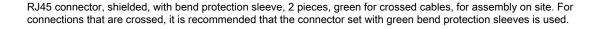
cULus Listed

## Accessories

Accessories

Connector set

RJ45 connector - FL PLUG RJ45 GR/2 - 2744856

RJ45 connector, shielded, with bend protection sleeve, 2 pieces, gray for straight cables, for assembly on site. For connections that are not crossed, it is recommended that you use the connector set with gray bend protection sleeve.

RJ45 connector - FL PLUG RJ45 GN/2 - 2744571

RJ45 connector, shielded, with bend protection sleeve, 2 pieces, green for crossed cables, for assembly on site. For connections that are crossed, it is recommended that the connector set with green bend protection sleeves is used.

Data cable by the meter

Cable - FL CAT5 HEAVY - 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 mm², solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.75 mm ± 0.15 mm diameter

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## Accessories

Network cable - FL CAT5 FLEX - 2744830

CAT5-SF/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm², stranded, shielded, outer sheath: 5.75 mm ± 0.15 mm diameter

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## Data cable preassembled

FO patch cable - FL SM PATCH 1,0 LC-SC - 2989190

Assembled fiber optic cable, break-out cable, fiberglass single mode 9/125 µm, connector: LC/SC duplex, degree of protection: IP20, for installation in cable ducts or control cabinets, length: 1 m

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FO patch cable - FL SM PATCH 2,0 LC-SC - 2989297

Assembled fiber optic cable, break-out cable, fiberglass single mode 9/125 µm, connector: LC/SC duplex, degree of protection: IP20, for installation in cable ducts or control cabinets, length: 2 m

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FO patch cable - FL SM PATCH 5,0 LC-SC - 2901827

Assembled FO cable, break out cable, single-mode fiberglass 9/125 µm, connector: LC / SC Duplex, protection type: IP20, for installation in cable ducts or control cabinets, length: 5 m

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FO patch cable - FL SM PATCH 1,0 SC-SC - 2901829

Assembled FO cable, break out cable, single-mode fiberglass 9/125 µm, connector: SC Duplex / SC-Duplex, protection type: IP20, for installation in cable ducts or control cabinets, length: 1 m

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# FO converters - FL MC EF 1300 SM SC - 2902856

## Accessories

FO patch cable - FL SM PATCH 2,0 SC-SC - 2901830

Assembled FO cable, break out cable, single-mode fiberglass 9/125 µm, connector: SC Duplex / SC-Duplex, protection type: IP20, for installation in cable ducts or control cabinets, length: 2 m

FO patch cable - FL SM PATCH 5,0 SC-SC - 2901831

Assembled FO cable, break out cable, single-mode fiberglass 9/125 µm, connector: SC Duplex / SC-Duplex protection type: IP20, for installation in cable ducts or control cabinets, length: 5 m

FO patch cable - FL SM PATCH 1,0 SC-ST - 2901832

Assembled FO cable, break out cable, single-mode fiberglass 9/125 µm, connector: SC Duplex / B-FOC (ST), protection type: IP20, for installation in cable ducts or control cabinets, length: 1 m

FO patch cable - FL SM PATCH 2,0 SC-ST - 2901833

Assembled FO cable, break out cable, single-mode fiberglass 9/125 µm, connector: SC Duplex / B-FOC (ST), protection type: IP20, for installation in cable ducts or control cabinets, length: 2 m

FO patch cable - FL SM PATCH 5,0 SC-ST - 2901834

Assembled FO cable, break out cable, single-mode fiberglass 9/125 µm, connector: SC Duplex / B-FOC (ST), protection type: IP20, for installation in cable ducts or control cabinets, length: 5 m

Data plug

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## Accessories

RJ45 connector - VS-08-RJ45-5-Q/IP20 - 1656725

RJ45 connector, IP20, CAT5e, 8-pos., with QUICKON fast connection technology, for 26 ... 23 AWG 1-wire and 7-wire conductors, for 4.5 mm ... 8.0 mm cable diameter, labeling: TIA 568 B, color: gray

## DIN rail connector

Cable - ME 22,5 TBUS 1,5/ 5-ST-3,81 GN - 2707437

DIN rail connector for DIN rail mounting. Universal for TBUS housing. Gold-plated contacts, 5-pos.

Electronic housing - ME 17,5 TBUS 1,5/ 5-ST-3,81 GN - 2709561

DIN rail connector for DIN rail mounting. Universal for TBUS housing. Gold-plated contacts, 5-pos.

## Power supply

Power supply unit - MINI-SYS-PS-100-240AC/24DC/1.5 - 2866983

DIN rail power supply unit, primary-switched mode, narrow design, output: 24 V DC / 1.5 A

## Universal tools

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## Accessories
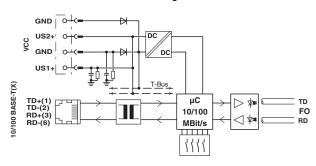
Assembly tool - FL CRIMPTOOL - 2744869

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

## Drawings

Block diagram