

## FO converters - FL MC 2000E LC - 2891056

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FO converter with LC duplex fiber optic connection (1300 nm), for converting 100Base-TX to multi-mode fiberglass. Auto MDI(X) function. Comprehensive link diagnostics. DIN rail mountable, 12 ... 57 V DC supply. Meets IEC 61850-3 and IEEE 1613 standards.

### Your advantages

- Network structure according to IEC 61850
- IEEE 1613
- Auto MDI/MDI-X switch-over
- Link fault pass through (LFPT) function for easy connection monitoring
- Data transfer rates of 100 Mbps



### Key Commercial Data

Packing unit	1 pc
GTIN	 4 046356 763141
GTIN	4046356763141
Weight per Piece (excluding packing)	315.000 g
Custom tariff number	85176200
Country of origin	Taiwan

### Technical data

#### Note

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

Width	30 mm
Height	130 mm
Depth	100 mm

#### Ambient conditions

Ambient temperature (operation)	-40 °C ... 75 °C
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## Technical data

### Ambient conditions

Ambient temperature (storage/transport)	-40 °C ... 85 °C
Permissible humidity (operation)	5 % ... 95 % (non-condensing)
Permissible humidity (storage/transport)	5 % ... 95 % (non-condensing)
Altitude	4850 m
Degree of protection	IP20
Noise immunity	IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005

### General

Electrical isolation	VCC // FE // Ethernet
Latency	700 ns (Pass-through mode, 100 Mbps, static)
Test voltage data interface/power supply	1500 V AC (500 V AC, 1 minute)
Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Noise emission	EN 61000-6-4
Mounting position	On horizontal DIN rail NS 35 in acc. with EN 60715
Net weight	315 g
Housing material	Aluminum
MTTF	95.3 Years (MIL-HDBK-217F standard, temperature 25°C, operating cycle 100%)
Conformance	CE-compliant
UL, USA/Canada	Class I, Div. 2, Groups A, B, C, D

### Power supply

Nominal supply voltage	24 V DC
	48 V DC
Supply voltage range	12 V DC ... 57 V DC
Typical current consumption	110 mA (24 V DC)
Connection method	Plug-in screw terminal block (COMBICON), redundancy possible
Conductor cross section flexible max.	2.50 mm <sup>2</sup>
Conductor cross section flexible min.	0.20 mm <sup>2</sup>
Conductor cross section solid max.	2.50 mm <sup>2</sup>
Conductor cross section solid min.	0.20 mm <sup>2</sup>
Max. AWG conductor cross section, flexible	12
Min. AWG conductor cross section, flexible	24
Conductor cross section AWG max.	12
Conductor cross section AWG min.	24

### Interfaces

Interface 1	Ethernet interface, 100Base-Tx in acc. with IEEE 802.3u
No. of ports	1
Connection method	RJ45 socket, shielded
Transmission medium	Copper
Transmission length	100 m (twisted pair, shielded)
Link through	Link fault pass through

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## Technical data

### Interfaces

MDI-/MDI-X switchover	Auto-MDI(X)
Signal LEDs	LNK/ACT, 100
Data flow control/protocols	IEC 61850-3, IEEE 1613
Serial transmission speed	100 Mbps

### Optical interface FO

Wavelength	1310 nm
Transmission length incl. 3 dB system reserve	8 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)
	3.3 km (fiberglass with F-G 62.5/125 2.6 dB/km F600)
	9.6 km (fiberglass with F-G 50/125 0.7 dB/km F1200)
	5.3 km (fiberglass with F-G 50/125 1.6 dB/km F800)
Transmission medium	Multi-mode fiberglass
	GI-HCS fiber
Connection method	LC duplex

### Digital outputs

Output name	Relay output
Output description	Alarm output
Number of outputs	1
Contact type	N/C contact
Maximum switching voltage	≤ 250 V AC
Max. switching current	1 A

### Standards and Regulations

Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Type of test	Vibration resistance in acc. with EN 60068-2-6/IEC 60068-2-6
Test result	5g, 150 Hz, Criterion 3
Type of test	Shock in acc. with EN 60068-2-27/IEC 60068-2-27
Test result	30g, 11 ms half-sine shock pulse
Noise emission	EN 61000-6-4
Noise immunity	IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005
Standards/regulations	EN 61000-4-2
	EN 61000-4-3
	EN 61000-4-4
Comments	Criterion A
Standards/regulations	EN 61000-4-5
	EN 61000-4-6
Shock	300 m/s <sup>2</sup> , 11 ms (IEC 60068-2)
Conformance	CE-compliant
UL, USA/Canada	Class I, Div. 2, Groups A, B, C, D

### Environmental Product Compliance

REACH SVHC	Lead 7439-92-1
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## Technical data

### Environmental Product Compliance

China RoHS	Environmentally Friendly Use Period = 10;
	For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration"

## Classifications

### eCl@ss

eCl@ss 4.0	27230200
eCl@ss 4.1	27230200
eCl@ss 5.0	27230200
eCl@ss 5.1	27230200
eCl@ss 6.0	19179200
eCl@ss 7.0	19179290
eCl@ss 8.0	19179290
eCl@ss 9.0	19170114

### ETIM

ETIM 3.0	EC000310
ETIM 4.0	EC000310
ETIM 5.0	EC001467
ETIM 6.0	EC001467
ETIM 7.0	EC001467

### UNSPSC

UNSPSC 6.01	30211506
UNSPSC 7.0901	39121008
UNSPSC 11	39121008
UNSPSC 12.01	39121008
UNSPSC 13.2	43222604
UNSPSC 18.0	43223323
UNSPSC 19.0	43223323
UNSPSC 20.0	43223323
UNSPSC 21.0	43223323

## Approvals

### Approvals

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#### Approvals

UL Listed / cUL Listed / cULus Listed

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## Approvals

Ex Approvals

UL Listed / cUL Listed / cULus Listed

### Approval details

UL Listed		<a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a>	FILE E 140324
mm <sup>2</sup> /AWG/kcmil		30-14	

cUL Listed		<a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a>	FILE E 140324
mm <sup>2</sup> /AWG/kcmil		30-14	

cULus Listed	
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## Accessories

### Accessories

#### Data cable preassembled

Patch cable - NBC-R4AC-R4AC-IE8A/.../... - 1411854



Patch cable, degree of protection: IP20, number of positions: 8, 10 Gbps, CAT6<sub>A</sub>, cable outlet: straight

Patch cable - NBC-R4AC/10G-R4AC/10G-94F/2,0 - 1408360



Patch cable, CAT6<sub>A</sub>, 4-pair, shielded, connection not crossed (line), assembled at both ends with RJ45/IP20 connectors, outer sheath material: PUR, length: 2.0 m

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### Accessories

Patch cable - NBC-R4AC/10G-R4AC/10G-94F/3,0 - 1408365



Patch cable, CAT6<sub>A</sub>, 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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### End block

End clamp - E/NS 35 N - 0800886



End clamp, width: 9.5 mm, color: gray

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### Mounting rail adapter

DIN rail adapter - FL DIN RA - 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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### Patch cable

Patch cable - FL CAT5 PATCH 0,5 - 2832263



Patch cable, CAT5, assembled, 0.5 m

Patch cable - FL CAT5 PATCH 1,0 - 2832276



Patch cable, CAT5, assembled, 1 m

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### Accessories

Patch cable - FL CAT5 PATCH 2,0 - 2832289



Patch cable, CAT5, assembled, 2 m

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### PCB plug

Printed-circuit board connector - MSTB 2,5/ 8-ST - 1754562



PCB connector, nominal current: 12 A, rated voltage (III/2): 320 V, nominal cross section: 2.5 mm<sup>2</sup>, number of positions: 8, pitch: 5 mm, connection method: Screw connection with tension sleeve, color: green, contact surface: Tin

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### Protective cap

Dust protection - FL RJ45 PROTECT CAP - 2832991



Dust protection caps for RJ45 socket

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### Surge protection for information technology

Surge protection device - DT-LAN-CAT.6+ - 2881007



Surge protection in accordance with Class E<sub>A</sub> (CAT6<sub>A</sub>), for Gigabit Ethernet (up to 10 Gbps), token ring, FDDI/ CDDI, ISDN, and DS1. Suitable for Power over Ethernet (PoE+) "Mode A" and "Mode B". RJ45 attachment plug with separate grounding cable and ground connection snap-on foot for NS 35 DIN rails.