

Industrial communication technology – Industrial Ethernet

Make the most of all the options offered by your Ethernet network.

Phoenix Contact offers you more real time, more wireless, more safety, and more reliability.

Industrial Ethernet from Phoenix Contact can be easily integrated into your automation infrastructure – because we make Ethernet easy.

Benefit from our experience in automation which spans decades and the experience we have gained in industrial Ethernet networks over the past ten plus years.

We know and understand the expectations and demands placed on automation. This is evident and embodied in our products and solutions.

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Unmanaged Switches



Unmanaged Switches with basic functions
in IP20
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Unmanaged Switches with basic functions
in IP67
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Unmanaged Power over Ethernet Switches
in IP30 and IP67
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Managed Switches



2000 series Managed Switches
for PROFINET networks
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3000 series Managed Switches
with IT functions
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4000 series Managed Switches
with two Gigabit uplink ports
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4000 series Managed Power over
Ethernet Switches
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Managed Switches



4000 series Managed Switches
for 19" rack mounting
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SMCS series Managed Switches
with a very flat design
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IRT series Managed Switches for
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7000 series Managed Switches for
high-availability EtherNet/IP™ networks
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Routers and Layer 3 switches



2000 series Managed Switches
with NAT router functions
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GHS series Modular Gigabit switches
with Layer 3 functions
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Switch accessories



SFP modules and configuration memory
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Security routers and firewalls



mGuard security routers for DIN rails
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mGuard security routers for mounting without a DIN rail
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Software



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Redundancy modules



PRP redundancy modules for parallel network redundancy
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PoE injector



PoE injectors for the common transmission of power and data
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Ethernet extenders



Managed and unmanaged Ethernet extenders for large IP networks
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Media converters



Universal media converters for conversion to fiber optics
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Media converters for real-time protocols and IEC 61850 environments
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Serial device servers, gateways, and proxies



Serial device servers and protocol converters, multiport, for conversion to Ethernet
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Serial device servers, 1 port, for conversion to Ethernet
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Proxies as a link between PROFINET networks and other fieldbus systems
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Patch panels



Passive mini patch panels with various connection options
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Isolator



4 kV isolator for electrical isolation
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COMPLETE line



The comprehensive solution for your control cabinet:
Easy planning, intuitive installation
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Standard switches with basic functions

FL SWITCH SFNB... Unmanaged Switches are designed for simple entry-level applications where low installation costs and a high degree of industrialization are required.

Features:

- 5 to 8 ports in a narrow, metal housing
- Optional SC and ST fiber optic ports
- For longer distances, multimode and single mode fiber connections are available
- RJ45 ports provide 10/100 Mbps speeds; fiber optic ports operate at 100 Mbps
- Auto negotiation and autocrossing simplify installation and setup
- LED indicators provide local diagnostics
- Cable locking security options



5 RJ45 ports



Technical data	
Ethernet interface	
Number of ports	5 (RJ45 ports)
Transmission speed	10/100 Mbps
Fiber optic interface	
Number of ports	-
Transmission speed	-
Connection method	-
Wavelength	-
Transmission distance	-
Function	
Basic functions	Unmanaged Switch / auto negotiation, complies with IEEE 802.3, store and forward switching mode
Status and diagnostic indicators	LEDs: U _S , link and activity per port
Power supply	
Supply voltage	24 V DC
Residual ripple	3.6 V _{PP}
Supply voltage range	12 V DC ... 48 V DC
Typical current consumption	185 mA (at U _S = 24 V DC)
General data	
Dimensions	W / H / D 28 mm / 110 mm / 70 mm
Degree of protection	IP20
Ambient temperature (operation)	-10°C ... 60°C
Permissible humidity (operation)	5% ... 95% (non-condensing)
Noise emission	EN 61000-6-4
Noise immunity	EN 61000-6-2
EMC note	Class A product, see page 527

Ordering data		
Type	Order No.	Pcs./Pkt.
FL SWITCH SFNB 5TX	2891001	1

Description
Ethernet switch
- 5 RJ45 ports
- 8 RJ45 ports
- 4 RJ45 ports, 1 SC FO port
- 4 RJ45 ports, 1 ST FO port



8 RJ45 ports

4 RJ45 ports and
1 fiber optic port (multimode)4 RJ45 ports and
1 fiber optic port (single mode)

Ex:

Technical data

8 (RJ45 ports)
10/100 Mbps-
-
-
-Unmanaged Switch / auto negotiation, complies with IEEE 802.3,
store and forward switching modeLEDs: U_S, link and activity per port24 V DC
3.6 V_{PP}
9 V DC ... 32 V DC
140 mA (at U_S = 24 V DC)50 mm / 110 mm / 70 mm
IP20
-10°C ... 60°C
5% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2:2005
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFNB 8TX	2891002	1



Ex:

Technical data

FL SWITCH SFNB 4TX/FX FL SWITCH SFNB 4TX/FX ST

4 (RJ45 ports)
10/100 Mbps

1 (SC multimode)	1 (ST multimode)
100 Mbps (full duplex)	
SC	ST
1310 nm	
12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	

Unmanaged Switch / auto negotiation, complies with IEEE 802.3,
store and forward switching modeLEDs: U_S, link and activity per port

24 V DC	
3.6 V _{PP}	
12 V DC ... 48 V DC	
185 mA (at U _S = 24 V DC)	175 mA (at U _S = 24 V DC)

28 mm / 110 mm / 70 mm	
IP20	
0°C ... 60°C	-10°C ... 60°C
5% ... 95% (non-condensing)	
EN 61000-6-4	
EN 61000-6-2	
Class A product, see page 527	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFNB 4TX/FX	2891027	1
FL SWITCH SFNB 4TX/FX ST	2891028	1



Ex:

Technical data

4 (RJ45 ports)
10/100 Mbps

1 (SC single mode)	
100 Mbps (full duplex)	
SC	
1310 nm	
25 km (fiberglass with F-G 9/125 0.5 dB/km)	

Unmanaged Switch / auto negotiation, complies with IEEE 802.3,
store and forward switching modeLEDs: U_S, link and activity per port

24 V DC	
3.6 V _{PP}	
12 V DC ... 48 V DC	
175 mA (at U _S = 24 V DC)	

28 mm / 110 mm / 70 mm	
IP20	
-10°C ... 60°C	
5% ... 95% (non-condensing)	
EN 61000-6-4	
EN 61000-6-2	
Class A product, see page 527	

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFNB 4TX/FX SM20	2891029	1

Unmanaged Switches

Standard switches with up to 8 ports

FL SWITCH SFN... Unmanaged

Switches have a wide range of port configurations and features for standard applications.

Features:

- 5 to 8 ports in a narrow, metal housing
- Optional SC and ST fiber optic ports
- Quality of Service (QoS) prioritized messages
- RJ45 ports provide 10/100 Mbps speeds; fiber optic ports operate at 100 Mbps
- Auto negotiation and autocrossing simplify installation and setup
- LED indicators provide local diagnostics
- Switch-mounted cable locking and port blocking options



**5/8 RJ45 ports
for PROFINET**

		Technical data	
		FL SWITCH SFN 5TX-PN	FL SWITCH SFN 8TX-PN
Ethernet interface			
Number of ports		5 (RJ45 ports)	8 (RJ45 ports)
Transmission speed		10/100 Mbps	
Fiber optic interface			
Number of ports		-	
Transmission speed		-	
Wavelength		-	
Transmission distance		-	
Function			
Basic functions		Unmanaged Switch / auto negotiation, complies with IEEE 802.3, store and forward switching mode	
Status and diagnostic indicators		LEDs: U _S , link and activity per port	
Power supply			
Supply voltage		24 V DC	
Residual ripple		3.6 V _{pp}	
Supply voltage range		9 V DC ... 32 V DC	
Typical current consumption		90 mA (at U _S = 24 V DC)	140 mA (at U _S = 24 V DC)
General data			
Dimensions	W / H / D	30 mm / 130 mm / 100 mm	50 mm / 130 mm / 100 mm
Degree of protection		IP20	
Ambient temperature (operation)		0°C ... 60°C	
Permissible humidity (operation)		5% ... 95% (non-condensing)	
Noise emission		EN 61000-6-4	
Noise immunity		EN 61000-6-2:2005	
EMC note		Class A product, see page 527	
Ordering data			
Type		Order No.	Pcs./Pkt.
FL SWITCH SFN 5TX-PN		2891151	1
FL SWITCH SFN 8TX-PN		2891018	1
Ethernet switch			
- 5 RJ45 ports			
- 8 RJ45 ports			
- 8 RJ45 ports, flow control disabled			
- 4 RJ45 ports, 1 SC FO port			
- 4 RJ45 ports, 1 ST FO port			
- 7 RJ45 ports, 1 SC FO port			
- 7 RJ45 ports, 1 ST FO port			
- 7 RJ45 ports, 1 SC FO port, flow control disabled			
- 6 RJ45 ports, 2 SC FO ports			
- 6 RJ45 ports, 2 ST FO ports			
- 6 RJ45 ports, 2 SC FO ports, flow control disabled			



5/8 RJ45 ports



4/7 RJ45 ports and 1 FO port



6 RJ45 ports and 2 FO ports



Ex:

Technical data

FL SWITCH SFN 5TX FL SWITCH SFN 8TX

5 (RJ45 ports) 8 (RJ45 ports)
10/100 Mbps-
-
-
-

Unmanaged Switch / auto negotiation, complies with IEEE 802.3, store and forward switching mode

LEDs: U_S, link and activity per port

24 V DC

3.6 V_{PP}

9 V DC ... 32 V DC

90 mA (at U_S = 24 V DC) 140 mA (at U_S = 24 V DC)

30 mm / 120 mm / 70 mm 50 mm / 120 mm / 70 mm

IP20

0°C ... 60°C

5% ... 95% (non-condensing)

EN 61000-6-4

EN 61000-6-2:2005

Class A product, see page 527



Ex:

Technical data

FL SWITCH SFN 4TX/FX FL SWITCH SFN 7TX/FX ST

4 (RJ45 ports) 7 (RJ45 ports)
10/100 Mbps1 (SC multimode) 1 (ST multimode)
100 Mbps (full duplex)
1300 nm
2000 m (Fiberglass 50/125)
2000 m (Fiberglass 62.5/125)

Unmanaged Switch / auto negotiation, complies with IEEE 802.3, store and forward switching mode

LEDs: U_S, link and activity per port

24 V DC

3.6 V_{PP}

9 V DC ... 32 V DC

140 mA (at U_S = 24 V DC) 190 mA (at U_S = 24 V DC)

30 mm / 120 mm / 70 mm 50 mm / 120 mm / 70 mm

IP20

0°C ... 60°C

5% ... 95% (non-condensing)

EN 61000-6-4

EN 61000-6-2:2005

Class A product, see page 527



Ex:

Technical data

FL SWITCH SFN 6TX/2FX FL SWITCH SFN 6TX/2FX ST

6 (RJ45 ports)
10/100 Mbps2 (SC multimode) 2 (ST multimode)
100 Mbps (full duplex)
1300 nm
2000 m (Fiberglass 50/125)
2000 m (Fiberglass 62.5/125)

Unmanaged Switch / auto negotiation, complies with IEEE 802.3, store and forward switching mode

LEDs: U_S, link and activity per port

24 V DC

3.6 V_{PP}

9 V DC ... 32 V DC

230 mA (at U_S = 24 V DC)

50 mm / 120 mm / 70 mm

IP20

0°C ... 60°C

5% ... 95% (non-condensing)

EN 61000-6-4

EN 61000-6-2:2005

Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 5TX	2891152	1
FL SWITCH SFN 8TX	2891929	1
FL SWITCH SFN 8TX-NF	2891022	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 4TX/FX	2891851	1
FL SWITCH SFN 4TX/FX ST	2891453	1
FL SWITCH SFN 7TX/FX	2891097	1
FL SWITCH SFN 7TX/FX ST	2891110	1
FL SWITCH SFN 7TX/FX-NF	2891023	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 6TX/2FX	2891314	1
FL SWITCH SFN 6TX/2FX ST	2891411	1
FL SWITCH SFN 6TX/2FX-NF	2891024	1

Unmanaged Switches

Standard switches with up to 16 ports

FL SWITCH SFN(T)... 16-port Unmanaged Switches provide Ethernet connections with high contact density for larger or higher-level applications.

Features:

- 16 ports in a narrow, metal housing with redundant power supply
- Optional SC fiber optic ports
- Standard devices (-10°C ... +60°C) and devices with wide temperature range (-40°C ... +75°C) available
- RJ45 ports provide 10/100 Mbps speeds; fiber optic ports operate at 100 Mbps
- Auto negotiation and autocrossing simplify installation and setup
- LED indicators provide local diagnostics
- Cable locking security options
- DC and AC power supply options



5/8 RJ45 ports with AC supply



Ethernet interface
Number of ports
Transmission speed
Fiber optic interface
Number of ports
Transmission speed
Wavelength
Transmission distance
Function
Basic functions
Status and diagnostic indicators
Power supply
Supply voltage
Residual ripple
Supply voltage range
Typical current consumption
General data
Dimensions
Degree of protection
Ambient temperature (operation)
Permissible humidity (operation)
Noise emission
Noise immunity
EMC note

Technical data	
FL SWITCH SFN 5TX-24VAC	FL SWITCH SFN 8TX-24VAC
5 (RJ45 ports)	8 (RJ45 ports)
10/100 Mbps	
	-
	-
	-
	-
Unmanaged Switch / auto negotiation, complies with IEEE 802.3, store and forward switching mode	
LEDs: U _S , link and activity per port	
	24 V AC/DC
	3.6 V _{pp}
	20 V AC ... 28 V AC
114 mA (at U _S = 24 V AC)	189 mA (at U _S = 24 V AC)
30 mm / 120 mm / 70 mm	50 mm / 120 mm / 70 mm
	IP20
	0°C ... 60°C
	5% ... 95% (non-condensing)
	EN 61000-6-4
	EN 61000-6-2:2005
	Class A product, see page 527

Description
Ethernet switch
- 5 RJ45 ports
- 8 RJ45 ports
Ethernet switch
- 16 RJ45 ports
- 15 RJ45 ports, 1 SC FO port
- 14 RJ45 ports, 2 SC FO ports
Ethernet switch, wide temperature
- 16 RJ45 ports
- 14 RJ45 ports, 2 SC FO ports

Ordering data		
Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 5TX-24VAC	2891021	1
FL SWITCH SFN 8TX-24VAC	2891020	1



16 RJ45 ports



15 RJ45 ports and 1 FO port



14 RJ45 ports and 2 FO ports



Ex:

Technical data

FL SWITCH SFN 16TX FL SWITCH SFNT 16TX

16 (RJ45 ports)
10/100 Mbps-
-
-
-

Unmanaged Switch / auto negotiation, complies with IEEE 802.3, store-and-forward switching mode, includes alarm contacts

LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port24 V DC (redundant)
3.6 V_{PP}
12 V DC ... 48 V DC
350 mA (at U_S = 24 V DC)70 mm / 135 mm / 110 mm
IP20

0°C ... 60°C -40°C ... 75°C

5% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2

Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 16TX	2891933	1
FL SWITCH SFNT 16TX	2891952	1



Ex:

Technical data

15 (RJ45 ports)
10/100 Mbps1 (SC multimode)
100 Mbps (full duplex)
1300 nm
12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)

Unmanaged Switch / auto negotiation, complies with IEEE 802.3, store-and-forward switching mode, includes alarm contacts

LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port24 V DC (redundant)
3.6 V_{PP}
12 V DC ... 48 V DC
350 mA (at U_S = 24 V DC)70 mm / 135 mm / 110 mm
IP200°C ... 60°C
5% ... 95% (non-condensing)EN 61000-6-4
EN 61000-6-2

Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 15TX/FX	2891934	1



Ex:

Technical data

FL SWITCH SFN 14TX/2FX FL SWITCH SFNT 14TX/2FX

14 (RJ45 ports)
10/100 Mbps2 (SC multimode)
100 Mbps (full duplex)
1300 nm

12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)

Unmanaged Switch / auto negotiation, complies with IEEE 802.3, store-and-forward switching mode, includes alarm contacts

LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port24 V DC (redundant)
3.6 V_{PP}
12 V DC ... 48 V DC
350 mA (at U_S = 24 V DC)70 mm / 135 mm / 110 mm
IP20

0°C ... 60°C -40°C ... 75°C

5% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 14TX/2FX	2891935	1
FL SWITCH SFNT 14TX/2FX	2891954	1

Standard Gigabit switch

FL SWITCH SFN... Gigabit

Unmanaged Switches have a wide range of port configurations with fiberglass and copper as well as functions for standard applications.

Features:

- 5/8 ports in a narrow, metal housing with redundant power supply
- All ports provide 1000 Mbps speeds
- LED indicators provide local diagnostics
- Relay contact
- **FL SWITCH SFN 6GT/2LX** provides a transmission distance of up to 10 km with 2 single mode fiberglass ports
- **FL SWITCH SFN 6GT/2LX-20** provides a transmission distance of up to 20 km with 2 single mode fiberglass ports



5 / 8 RJ45 ports



Ethernet interface	
Number of ports	
Transmission speed	
Fiber optic interface	
Number of ports	
Transmission speed	
Wavelength	
Transmission distance	
Function	
Basic functions	
Status and diagnostic indicators	
Power supply	
Supply voltage	
Residual ripple	
Supply voltage range	
Typical current consumption	
General data	
Dimensions	W / H / D
Degree of protection	
Ambient temperature (operation)	
Permissible humidity (operation)	
Noise emission	
Noise immunity	
EMC note	

Technical data	
FL SWITCH SFN 5GT	FL SWITCH SFN 8GT
5 (RJ45 ports)	8 (RJ45 ports)
	10/100/1000 Mbps
	-
	-
	-
	-
Unmanaged Switch / auto negotiation, complies with IEEE 802.3, store and forward switching mode	
LEDs: U _S , link and activity per port	LEDs: U _{S1} , U _{S2} (redundant voltage supply), link and activity per port
24 V DC	24 V DC (redundant)
	3.6 V _{PP}
10 V DC ... 60 V DC	9 V DC ... 32 V DC
200 mA (at U _S = 24 V DC)	430 mA (at U _S = 24 V DC)
28 mm / 110 mm / 70 mm	50 mm / 120 mm / 70 mm
	IP20
-10°C ... 60°C	-40°C ... 75°C
	5% ... 95% (non-condensing)
	EN 61000-6-4
	EN 61000-6-2:2005
	Class A product, see page 527

Description
Ethernet switch
- 5 RJ45 ports
- 8 RJ45 ports
- 7 RJ45 ports, 1 SC FO port (multimode)
- 6 RJ45 ports, 2 SC FO ports (multimode)
- 6 RJ45 ports, 2 SC FO ports (single mode) with 10 km range
- 6 RJ45 ports, 2 SC FO ports (single mode) with 20 km range
Ethernet switch, wide temperature
- 5 RJ45 ports
Ethernet switch, wide temperature, protective coating for harsh environments
- 5 RJ45 ports

Ordering data		
Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 5GT	2891444	1
FL SWITCH SFN 8GT	2891673	1



**7 / 6 RJ45 ports and
1 / 2 fiber optic ports (multimode)**



Ex:

Technical data

FL SWITCH SFN 7GT/SX FL SWITCH SFN 6GT/2SX

7 (RJ45 ports) 6 (RJ45 ports)
10/100/1000 Mbps

1 (SC multimode) 2 (SC multimode)
1000 Mbps (full duplex)
850 nm
220 m (Fiberglass 62.5/125)

Unmanaged Switch / auto negotiation, complies with IEEE 802.3,
store and forward switching mode

LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port

24 V DC (redundant)
3.6 V_{PP}
9 V DC ... 32 V DC
320 mA (at U_S = 24 V DC) 350 mA (at U_S = 24 V DC)

50 mm / 120 mm / 70 mm
IP20
-25°C ... 75°C
5% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2:2005
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 7GT/SX	2891518	1
FL SWITCH SFN 6GT/2SX	2891398	1



**6 RJ45 ports and
2 fiber optic ports (single mode)**



Ex:

Technical data

FL SWITCH SFN 6GT/2LX FL SWITCH SFN 6GT/2LX-20

6 (RJ45 ports)
10/100/1000 Mbps

2 (SC single mode)
1000 Mbps (full duplex)
1310 nm
10000 m (Fiberglass 9/125) 20000 m (Fiberglass 9/125)

Unmanaged Switch / auto negotiation, complies with IEEE 802.3,
store and forward switching mode

LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port

24 V DC (redundant)
3.6 V_{PP}
9 V DC ... 32 V DC
360 mA (at U_S = 24 V DC)

50 mm / 120 mm / 70 mm
IP20
-25°C ... 75°C 0°C ... 60°C
5% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2:2005
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFN 6GT/2LX	2891987	1
FL SWITCH SFN 6GT/2LX-20	2891563	1



**5 RJ45 ports,
extended temperature range
(-40°C ... +75°C)**



Ex:

Technical data

FL SWITCH SFNT 5GT FL SWITCH SFNT 5GT-C

5 (RJ45 ports)
10/100/1000 Mbps

-
-
-
-

Unmanaged Switch / auto negotiation, complies with IEEE 802.3,
store and forward switching mode, includes QoS and alarm contact

LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port

24 V DC (redundant)
3.6 V_{PP}
10 V DC ... 60 V DC
223 mA (at U_S = 24 V DC)

30 mm / 130 mm / 100 mm
IP20
-40°C ... 75°C
5% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2:2005
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFNT 5GT	2891390	1
FL SWITCH SFNT 5GT-C	2891391	1

Unmanaged Switches

Standard switch with wide temperature range

FL SWITCH SFNT... Unmanaged Switches are designed for use in extreme environments and marine applications.

Features:

- 5 to 8 ports in a narrow, metal housing with redundant power supply
- Optional SC and ST fiber optic ports
- RJ45 ports provide 10/100 Mbps speeds; fiber optic ports operate at 100 Mbps
- Extended temperature range for harsh environments (-40°C ... +75°C)
- Auto negotiation and autocrossing simplify installation and setup
- Quality of Service (QoS) prioritized messages
- LED indicators provide local diagnostics
- Alarm contact provides power and link status diagnostics
- Switch-mounted cable locking and port blocking options



5/8 RJ45 ports



Ethernet interface
Number of ports
Transmission speed
Fiber optic interface
Number of ports
Transmission speed
Wavelength
Transmission distance
Function
Basic functions
Status and diagnostic indicators
Power supply
Supply voltage
Residual ripple
Supply voltage range
Typical current consumption
General data
Dimensions
Degree of protection
Ambient temperature (operation)
Permissible humidity (operation)
Noise emission
Noise immunity
EMC note

Technical data		
	FL SWITCH SFNT 5TX	FL SWITCH SFNT 8TX
Number of ports	5 (RJ45 ports)	8 (RJ45 ports)
Transmission speed	10/100 Mbps	
Fiber optic interface		
Number of ports	-	
Transmission speed	-	
Wavelength	-	
Transmission distance	-	
Function	Unmanaged Switch / auto negotiation, complies with IEEE 802.3, store and forward switching mode, includes QoS and alarm contact	
Status and diagnostic indicators	LEDs: U _{S1} , U _{S2} (redundant voltage supply), link and activity per port	
Power supply		
Supply voltage	24 V DC (redundant)	
Residual ripple	3.6 V _{pp}	
Supply voltage range	9 V DC ... 32 V DC	
Typical current consumption	125 mA (at U _S = 24 V DC)	155 mA (at U _S = 24 V DC)
General data		
Dimensions	30 mm / 130 mm / 100 mm	50 mm / 130 mm / 100 mm
Degree of protection	IP20	
Ambient temperature (operation)	-40°C ... 75°C	
Permissible humidity (operation)	5% ... 95% (non-condensing)	
Noise emission	EN 61000-6-4	
Noise immunity	EN 61000-6-2	
EMC note	Class A product, see page 527	

Description
Ethernet switch, wide temperature
- 5 RJ45 ports
- 8 RJ45 ports
- 4 RJ45 ports, 1 SC FO port
- 7 RJ45 ports, 1 SC FO port
- 7 RJ45 ports, 1 ST FO port
- 6 RJ45 ports, 2 SC FO ports
- 6 RJ45 ports, 2 ST FO ports
Ethernet switch, wide temperature, protective coating for harsh environments
- 5 RJ45 ports
- 8 RJ45 ports
- 4 RJ45 ports, 1 SC FO port
- 7 RJ45 ports, 1 SC FO port
- 7 RJ45 ports, 1 ST FO port
- 6 RJ45 ports, 2 SC FO ports
- 6 RJ45 ports, 2 ST FO ports

Ordering data		
Type	Order No.	Pcs./Pkt.
FL SWITCH SFNT 5TX	2891003	1
FL SWITCH SFNT 8TX	2891005	1
FL SWITCH SFNT 5TX-C	2891043	1
FL SWITCH SFNT 8TX-C	2891045	1

Mounting plate, for 5- and 8-port SFNT switches
--

Accessories		
FL PA SFNT 5-8	2891012	1



4 RJ45 ports and 1 FO port



7 RJ45 ports and 1 FO port



6 RJ45 ports and 2 FO ports



Ex: Ex, Ex, Ex, Ex, Ex, Ex, Ex, Ex, Ex, Ex

Technical data

4 (RJ45 ports)
10/100 Mbps1 (SC multimode)
100 Mbps (full duplex)
1300 nm
12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)

Unmanaged Switch / auto negotiation, complies with IEEE 802.3, store and forward switching mode, includes QoS and alarm contact

LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port24 V DC (redundant)
3.6 V_{PP}
9 V DC ... 32 V DC
180 mA (at U_S = 24 V DC)30 mm / 130 mm / 100 mm
IP20
-40°C ... 75°C
5% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFNT 4TX/FX	2891004	1
FL SWITCH SFNT 4TX/FX-C	2891044	1

Accessories

FL PA SFNT 5-8	2891012	1
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Ex: Ex, Ex, Ex, Ex, Ex, Ex, Ex, Ex, Ex, Ex

Technical data

FL SWITCH SFNT 7TX/FX FL SWITCH SFNT 7TX/FX ST

7 (RJ45 ports)
10/100 Mbps1 (SC multimode) 1 (ST multimode)
100 Mbps (full duplex)
1300 nm
12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)

Unmanaged Switch / auto negotiation, complies with IEEE 802.3, store and forward switching mode, includes QoS and alarm contact

LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port24 V DC (redundant)
3.6 V_{PP}
9 V DC ... 32 V DC
180 mA (at U_S = 24 V DC)50 mm / 130 mm / 100 mm
IP20
-40°C ... 75°C
5% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFNT 7TX/FX FL SWITCH SFNT 7TX/FX ST	2891006 2891007	1 1
FL SWITCH SFNT 7TX/FX-C FL SWITCH SFNT 7TX/FX ST-C	2891046 2891047	1 1

Accessories

FL PA SFNT 5-8	2891012	1
----------------	---------	---



Ex: Ex, Ex, Ex, Ex, Ex, Ex, Ex, Ex, Ex, Ex

Technical data

FL SWITCH SFNT 6TX/2FX FL SWITCH SFNT 6TX/2FX ST

6 (RJ45 ports)
10/100 Mbps2 (SC multimode) 2 (ST multimode)
100 Mbps (full duplex)
1300 nm
12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)

Unmanaged Switch / auto negotiation, complies with IEEE 802.3, store and forward switching mode, includes QoS and alarm contact

LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port24 V DC (redundant)
3.6 V_{PP}
9 V DC ... 32 V DC
250 mA (at U_S = 24 V DC)50 mm / 130 mm / 100 mm
IP20
-40°C ... 75°C
5% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SFNT 6TX/2FX FL SWITCH SFNT 6TX/2FX ST	2891025 2891026	1 1
FL SWITCH SFNT 6TX/2FX-C FL SWITCH SFNT 6TX/2FX ST-C	2891048 2891049	1 1

Accessories

FL PA SFNT 5-8	2891012	1
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FL SWITCH SF... Unmanaged Switches have a wide variety of port configurations in a low-profile metal housing and are designed for standard applications.

Features:

- Up to 16 ports in a low-profile metal housing with redundant power supply
- Optional SC and ST fiber optic ports
- RJ45 ports provide 10/100 Mbps speeds; fiber optic ports operate at 100 Mbps
- Auto negotiation and autocrossing simplify installation and setup
- LED indicators provide local diagnostics
- Relay contact for alarm processing of voltage states
- Cable locking security options



8/16 RJ45 ports



Ethernet interface
Number of ports
Transmission speed
Fiber optic interface
Number of ports
Transmission speed
Wavelength
Transmission distance
Other connections
Floating signal contact
Function
Basic functions
Status and diagnostic indicators
Power supply
Supply voltage
Residual ripple
Supply voltage range
Typical current consumption
General data
Dimensions
Degree of protection
Ambient temperature (operation)
Permissible humidity (operation)
Noise emission
Noise immunity
EMC note

Technical data	
FL SWITCH SF 8TX	FL SWITCH SF 16TX
8 (RJ45 ports)	16 (RJ45 ports)
	10/100 Mbps
	-
	-
	-
	-
	Plug-in/screw connection via COMBICON
	Unmanaged Switch / auto negotiation, complies with IEEE 802.3, store and forward switching mode
	LEDs: U _{S1} , U _{S2} (redundant voltage supply), link and activity per port
	24 V DC (redundant)
	3.6 V _{PP}
	18.5 V DC ... 30.2 V DC
200 mA (at U _S = 24 V DC)	300 mA (at U _S = 24 V DC)
General data	
Dimensions	135 mm / 94.3 mm / 30 mm 205 mm / 94.3 mm / 30 mm
Degree of protection	IP20
Ambient temperature (operation)	0°C ... 55°C
Permissible humidity (operation)	5% ... 95% (non-condensing)
Noise emission	EN 61000-6-4
Noise immunity	EN 61000-6-2:2005
EMC note	Class A product, see page 527

Description
Ethernet switch
- 8 RJ45 ports
- 16 RJ45 ports
- 7 RJ45 ports, 1 SC FO port
- 7 RJ45 ports, 1 ST FO port
- 15 RJ45 ports, 1 SC FO port
- 6 RJ45 ports, 2 SC FO ports
- 6 RJ45 ports, 2 ST FO ports
- 14 RJ45 ports, 2 SC FO ports
- 4 RJ45 ports, 3 ST FO ports

Ordering data		
Type	Order No.	Pcs./Pkt.
FL SWITCH SF 8TX	2832771	1
FL SWITCH SF 16TX	2832849	1



7/15 RJ45 ports and 1 FO port



6/14 RJ45 ports and 2 FO ports



4 RJ45 ports and 3 FO ports



Ex:

Technical data

FL SWITCH SF 7TX/FX

FL SWITCH SF 15TX/FX

7 (RJ45 ports)

15 (RJ45 ports)

10/100 Mbps

1 (SC multimode)

100 Mbps (full duplex)

1300 nm

5.7 km (fiberglass with
F-G 50/125 0.7 dB/km F1200)6400 m (fiberglass with
F-G 50/125 0.7 dB/km F1200)

Plug-in/screw connection via COMBICON

Unmanaged Switch / auto negotiation, complies with IEEE 802.3,
store and forward switching modeLEDs: U_{S1} , U_{S2} (redundant voltage supply), link and activity per port

24 V DC (redundant)

24 V DC (redundant)

3.6 V_{PP}

18.5 V DC ... 30.2 V DC

220 mA (at $U_S = 24$ V DC)330 mA (at $U_S = 24$ V DC)

135 mm / 115.3 mm / 30 mm

205 mm / 115.3 mm / 30 mm

IP20

0°C ... 55°C

5% ... 95% (non-condensing)

EN 61000-6-4

EN 61000-6-2:2005

Class A product, see page 527



Ex:

Technical data

FL SWITCH SF 6TX/2FX

FL SWITCH SF 14TX/2FX

6 (RJ45 ports)

14 (RJ45 ports)

10/100 Mbps

2 (SC multimode)

100 Mbps (full duplex)

1300 nm

5.7 km (fiberglass with
F-G 50/125 0.7 dB/km F1200)6400 m (fiberglass with
F-G 50/125 0.7 dB/km F1200)

Plug-in/screw connection via COMBICON

Unmanaged Switch / auto negotiation, complies with IEEE 802.3,
store and forward switching modeLEDs: U_{S1} , U_{S2} (redundant voltage supply), link and activity per port

24 V DC (redundant)

3.6 V_{PP}

18.5 V DC ... 30.2 V DC

240 mA (at $U_S = 24$ V DC)360 mA (at $U_S = 24$ V DC)

135 mm / 115.3 mm / 30 mm

205 mm / 115.3 mm / 30 mm

IP20

0°C ... 55°C

5% ... 95% (non-condensing)

EN 61000-6-4

EN 61000-6-2:2005

Class A product, see page 527



Ex:

Technical data

4 (RJ45 ports)

10/100 Mbps

3 (ST multimode)

100 Mbps (full duplex)

1300 nm

6400 m (fiberglass with F-G 50/125 0.7 dB/km F1200)

Plug-in/screw connection via COMBICON

Unmanaged Switch / auto negotiation, complies with IEEE 802.3,
store and forward switching modeLEDs: U_{S1} , U_{S2} (redundant voltage supply), link and activity per port

24 V DC (redundant)

3.6 V_{PP}

18.5 V DC ... 30.2 V DC

240 mA (at $U_S = 24$ V DC)

135 mm / 115.3 mm / 30 mm

IP20

0°C ... 55°C

5% ... 95% (non-condensing)

EN 61000-6-4

EN 61000-6-2:2005

Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SF 7TX/FX	2832726	1
FL SWITCH SF 7TX/FX ST	2832577	1
FL SWITCH SF 15TX/FX	2832661	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SF 6TX/2FX	2832933	1
FL SWITCH SF 6TX/2FX ST	2832674	1
FL SWITCH SF 14TX/2FX	2832593	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SF 4TX/3FX ST	2832603	1

Unmanaged Switches

IP67 switches and switches for 19" rack mounting

The switches for rack mounting offer 24 twisted pair ports. They are optimized for large-scale or 19" applications with mounting rack assembly.

Thanks to its high degree of protection and compact design, the **FL SWITCH 1605 M12** is ideal for use directly in the machine.



24 RJ45 ports



5 ports in M12 format



Technical data

FL SWITCH 1824 FL SWITCH 1924

Ethernet interface	
Number of ports	24 (RJ45 ports)
Transmission speed	10/100 Mbps
Function	
Basic functions	Unmanaged Switch / auto negotiation, complies with IEEE 802.3, store and forward switching mode

Status and diagnostic indicators

LEDs: U_S, link and activity per port

Power supply

Supply voltage

120 V AC

220 V AC

Supply voltage range

100 V AC ... 240 V AC (50/60 Hz)

Typical current consumption

270 mA (100 V AC)

312 mA (100 V AC)

General data

Dimensions

W / H / D

440 mm / 44 mm / 173 mm

482 mm / 44 mm / 210 mm

Degree of protection

IP20

Ambient temperature (operation)

0°C ... 60°C

Permissible humidity (operation)

5% ... 95% (non-condensing)

Noise emission

EN 61000-6-4

Noise immunity

EN 61000-6-2:2005

EMC note

Class A product, see page 527

Technical data

5 (M12 socket)
10/100 Mbps

Unmanaged Switch / auto negotiation, complies with standard IEEE 802.3, store-and-forward switching mode, 2 priority classes in accordance with IEEE802.1p, PTCP filter

LEDs: U_S (power supply),
2 LEDs per Ethernet port (Link and Activity)

24 V DC (M12 connector)

9 V DC ... 32 V DC

40 mA (at U_S = 24 V DC)

30 mm / 200 mm / 41 mm

IP65 / IP66 / IP67

-40°C ... 70°C

10% ... 95%

EN 61000-6-4

EN 61000-6-2

Ordering data

Description

Ethernet switch

- 24 RJ45 ports

- 24 RJ45 ports, 1000 Mbps

Ethernet switch

- 5 Ethernet ports in M12 format

Type	Order No.	Pcs./Pkt.
FL SWITCH 1824	2891041	1
FL SWITCH 1924	2891057	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 1605 M12	2700200	1

Unmanaged Switches for IEC 61850 applications

The **FL SWITCH 1008E** industrial Unmanaged Switch is designed for use in energy technology. With its robust design, it can be used in environments subject to high levels of EMI around switchgear that have been designed in accordance with the new IEC 61850 standard.

Features:

- 8 RJ45 ports in metal housing with DIN rail adapter
- Extended temperature range for harsh environments (-40°C ... +75°C)
- Redundant power supply with a wide range from 12 ... 57 V DC (24, 36, 48 V DC)
- Robust design for high EMC requirements, such as electrostatic discharge with 15 kV air discharge and 8 kV contact discharge; surge withstand capability (surge) and fast transients (burst) up to 4 kV
- Floating alarm contact for power supply monitoring and diagnostics
- Link monitoring of every port for diagnostics via alarm LED and alarm contact can be configured via DIP switches

Notes:

A media converter which meets the same requirements that are required for switchgear and transformer substations in energy technology can be found on page 353

IEC 61850-3



8 RJ45 ports



Technical data

Ethernet interface	
Number of ports	8 (RJ45 ports)
Transmission speed	10/100 Mbps
Connection method	RJ45
Function	
Basic functions	Unmanaged Switch / auto negotiation, complies with IEEE 802.3, store and forward switching mode, includes QoS and alarm contact. Meets IEC 61850-3 and IEEE 1613 standards
Status and diagnostic indicators	LEDs: U _{S1} , U _{S2} (redundant voltage supply), link and activity per port
Network expansion parameters	
Cascading depth	Network, linear, and star structure: any
Maximum cable length (twisted pair)	100 m
Power supply	
Supply voltage	24 V DC (redundant) 48 V DC
Residual ripple	3.6 V _{pp}
Supply voltage range	12 V DC ... 57 V DC
Typical current consumption	440 mA (at U _S = 24 V DC)
General data	
Dimensions	W / H / D 54.4 mm / 146.4 mm / 125 mm
Degree of protection	IP20
Ambient temperature (operation)	-40°C ... 75°C
Permissible humidity (operation)	5% ... 95% (non-condensing)
Noise emission	EN 61000-6-4
Noise immunity	IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005
EMC note	Class A product, see page 527

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet switch - 8 RJ45 ports	FL SWITCH 1008E	2891065	1

Unmanaged Switches

Unmanaged Power over Ethernet Switches

The 1000 series Unmanaged Power over Ethernet (PoE) Switches enable you to supply up to eight end devices with power and data via the same Ethernet cable.

Features:

- Up to 30 W per port
- Gigabit data throughput
- Jumbo frame support
- Versions with link monitoring



4 RJ45 PoE ports and 1 RJ45 port



2 RJ45 PoE ports and 2 SFP ports



Technical data

Ethernet interface	
Number of ports	1 (RJ45 port)
Transmission speed	10/100 Mbps
Ethernet interface (PoE)	
Number of ports	4 (RJ45 ports)
Transmission speed	10/100 Mbps
Connection method	RJ45 socket
Fiber optic interface	
Number of ports	-
Transmission speed	-
Transmission distance	-
Function	
Basic functions	PSE, complies with IEEE 802.3at
Status and diagnostic indicators	
	LEDs: U _{S1} , U _{S2} (redundant voltage supply), Alarm (alarm contact), Link/Activity and PoE per Ethernet port
Power supply	
Supply voltage	24 V DC
Residual ripple	3.6 V _{PP}
Supply voltage range	18 V DC ... 57 V DC
Typical current consumption	148 mA (at U _S = 24 V DC)
General data	
Dimensions	W / H / D 55 mm / 117 mm / 78 mm
Degree of protection	IP20
Ambient temperature (operation)	-40°C ... 75°C
Permissible humidity (operation)	5% ... 95% (non-condensing)
EMC note	Class A product, see page 527

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Power over Ethernet switch	FL SWITCH 1001T-4POE	2891064	1
Gigabit Power over Ethernet switch			

Accessories

SFP module

Technical data

	-
	-
	2 (RJ45 ports)
	10/100/1000 Mbps
	RJ45 socket
	2 (SFP ports)
	100/1000 Mbps (full duplex)
	up to 80 km (depending on the fiber/SFP module used)
	Store-and-forward switch, 10/100/1000 Mbps, auto negotiation, redundant power supply, PoE in accordance with IEEE 802.3at/802.3af, jumbo frames up to 10240 bytes, alarm contact
	LEDs: U _{S1} , U _{S2} (redundant voltage supply), Alarm (alarm contact), Link/Activity and PoE per Ethernet port
	55 V DC (redundant)
	3.6 V _{PP}
	46 V DC ... 57 V DC (>52 V DC for PoE+ recommended)
	80 mA (at U _S = 55 V DC)
	42.8 mm / 100 mm / 101 mm
	IP30
	-40°C ... 75°C
	5% ... 95% (non-condensing)
	Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 1000T-2POE-GT-2SFP	1026765	1

Accessories

See page 332



4 RJ45 PoE ports and 1 RJ45 port,
optional 1 SFP port



8 RJ45 PoE ports and 2 SFP ports



8 PoE ports (M12 female),
for wall mounting,
IP67 protection



Technical data

FL SWITCH 1001T-4POE-GT FL SWITCH 1001T-4POE-GT-SFP

1 (RJ45 port)
10/100/1000 Mbps

4 (RJ45 ports)
10/100/1000 Mbps
RJ45 socket

- 1 (SFP port)
- 1000 Mbps (full duplex)
- up to 80 km (depending on the fiber/SFP module used)

Store-and-forward switch, 10/100/1000 Mbps, auto negotiation, redundant power supply, PoE in accordance with IEEE 802.3at/802.3af, jumbo frames up to 10240 bytes, alarm contact

LEDs: U_{S1} , U_{S2} (redundant voltage supply), Alarm (alarm contact), Link/Activity and PoE per Ethernet port

24 V DC
48 V DC
3.6 V_{PP}
18 V DC ... 57 V DC

165 mA (at $U_S = 24$ V DC) 214 mA (at $U_S = 24$ V DC)

30 mm / 149 mm / 107.8 mm
IP30
-40°C ... 75°C
5% ... 95% (non-condensing)
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 1001T-4POE-GT	1026937	1
FL SWITCH 1001T-4POE-GT-SFP	1026932	1

Accessories

See page 332

Technical data

8 (RJ45 ports)
10/100/1000 Mbps
RJ45 socket

2 (SFP ports)
1000 Mbps (full duplex)
up to 80 km (depending on the fiber/SFP module used)

Store-and-forward switch, 10/100/1000 Mbps, auto negotiation, redundant power supply, PoE in accordance with IEEE 802.3at/802.3af, jumbo frames up to 10240 bytes, alarm contact

LEDs: U_{S1} , U_{S2} (redundant voltage supply), Alarm (alarm contact), Link/Activity and PoE per Ethernet port

24 V DC
48 V DC
3.6 V_{PP}
18 V DC ... 57 V DC

470 mA (at $U_S = 24$ V DC)

63.5 mm / 145 mm / 136 mm
IP30
-40°C ... 75°C
5% ... 95% (non-condensing)
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 1000T-8POE-GT-2SFP	1026929	1

Accessories

See page 332

Technical data

8
10/100/1000 Mbps
M12 connector, 8-pos.

-
-
-

Store-and-forward switch, 10/100/1000 Mbps, auto negotiation, complies with standard IEEE 802.3, 4 priority classes in accordance with IEEE 802.1p, PoE in accordance with IEEE 802.3at/802.3af, jumbo frames up to 9720 bytes

LEDs: U_{S1} , U_{S2} (power supply), Fail (alarm contact), 3 LEDs per Ethernet port (Link, Activity, and PoE Status), and PoE performance

24 V DC (M12 connector)

3.6 V_{PP}
18.7 V DC ... 30.5 V DC

300 mA (at $U_S = 24$ V DC)

176 mm / 112 mm / 100 mm
IP65 / IP66 / IP67
-40°C ... 70°C (non-condensing)
10% ... 95%

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 1708 M12 POE	2701883	1

Accessories

2000 series Managed Switches for the series production of machines

2000 and 2100 Managed Switches provide an optimum range of functions for use in applications that require easy network configuration and diagnostics.

Features:

- Loop Protection via Rapid Spanning Tree Protocol (RSTP)
- Port-based DHCP server
- Configuration memory (SD card)
- IGMP snooping/querier
- PROFINET and EtherNet/IP™ supported
- Gigabit versions support jumbo frames



**5/8 RJ45 ports
10/100 Mbps**



Ethernet interface	
Number of ports	
Transmission speed	
Function	
Basic functions	
Management	
Diagnostic function	
Redundancy	
Status and diagnostic indicators	
Power supply	
Supply voltage	
Residual ripple	
Supply voltage range	
Typical current consumption	
General data	
Dimensions	W / H / D
Degree of protection	
Ambient temperature (operation)	
Permissible humidity (operation)	
Noise emission	
Noise immunity	
EMC note	

Description
Ethernet switch
- 5 RJ45 ports
- 8 RJ45 ports
- 16 RJ45 ports

Parameterization memory, Flash card without license

Technical data		
FL SWITCH 2005	FL SWITCH 2008	
5 (RJ45 ports)	8 (RJ45 ports)	
	10/100 Mbps	
Store-and-forward switch, complies with IEEE 802.3		
Web-based management (HTTP/HTTPS)		
SNMPv1/v2/v3		
Command-line interface (Telnet, SSH)		
RMON History		
LLDP (Link Layer Discovery Protocol)		
SNMP-Traps		
N:1-Portmirroring		
ACD (Address Conflict Detection)		
MRP (Media Redundancy Protocol)		
RSTP (Rapid Spanning Tree Protocol)		
LEDs: US (power supply),		
2 LEDs per Ethernet port (Link/Activity and Speed)		
24 V DC (single)		
3.6 V _{pp}		
18 V DC ... 32 V DC		
165 mA (at U _s = 24 V DC)	180 mA (at U _s = 24 V DC)	
45 mm / 130 mm / 115 mm		
IP20		
0°C ... 60°C		
10% ... 95% (non-condensing)		
EN 61000-6-4		
EN 61000-6-2		
Class A product, see page 527		
Ordering data		
Type	Order No.	Pcs./Pkt.
FL SWITCH 2005	2702323	1
FL SWITCH 2008	2702324	1
Accessories		
SD FLASH 2GB	2988162	1



16 RJ45 ports
10/100 Mbps



5/8 RJ45 ports
10/100/1000 Mbps



16 RJ45 ports
10/100/1000 Mbps



Technical data

Technical data

Technical data

FL SWITCH 2105 FL SWITCH 2108

16 (RJ45 ports)
10/100 Mbps

5 (RJ45 ports) 8 (RJ45 ports)
10/100/1000 Mbps

16 (RJ45 ports)
10/100/1000 Mbps

Store-and-forward switch, complies with IEEE 802.3

Store-and-forward switch, complies with IEEE 802.3

Store-and-forward switch, complies with IEEE 802.3

Web-based management (HTTP/HTTPS)
SNMPv1/v2/v3
Command-line interface (Telnet, SSH)
RMON History
LLDP (Link Layer Discovery Protocol)
SNMP-Traps
N:1-Portmirroring
ACD (Address Conflict Detection)
MRP (Media Redundancy Protocol)
RSTP (Rapid Spanning Tree Protocol)
LEDs: US (power supply),
2 LEDs per Ethernet port (Link/Activity and Speed)

Web-based management (HTTP/HTTPS)
SNMPv1/v2/v3
Command-line interface (Telnet, SSH)
RMON History
LLDP (Link Layer Discovery Protocol)
SNMP-Traps
N:1-Portmirroring
ACD (Address Conflict Detection)
MRP (Media Redundancy Protocol)
RSTP (Rapid Spanning Tree Protocol)
LEDs: US (power supply),
2 LEDs per Ethernet port (Link/Activity and Speed)

Web-based management (HTTP/HTTPS)
SNMPv1/v2/v3
Command-line interface (Telnet, SSH)
RMON History
LLDP (Link Layer Discovery Protocol)
SNMP-Traps
N:1-Portmirroring
ACD (Address Conflict Detection)
MRP (Media Redundancy Protocol)
RSTP (Rapid Spanning Tree Protocol)
LEDs: US (power supply),
2 LEDs per Ethernet port (Link/Activity and Speed)

24 V DC (single)
3.6 V_{PP}
18 V DC ... 32 V DC
315 mA (at U_S = 24 V DC)

24 V DC (single)
3.6 V_{PP}
18 V DC ... 32 V DC
225 mA (at U_S = 24 V DC) 275 mA (at U_S = 24 V DC)

24 V DC (single)
3.6 V_{PP}
18 V DC ... 32 V DC
315 mA (at U_S = 24 V DC)

85 mm / 130 mm / 115 mm
IP20
0°C ... 60°C
10% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2

45 mm / 130 mm / 115 mm
IP20
0°C ... 60°C
10% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2
Class A product, see page 527

85 mm / 130 mm / 115 mm
IP20
0°C ... 60°C
10% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2

Ordering data

Ordering data

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2106	2702903	1

Type	Order No.	Pcs./Pkt.
FL SWITCH 2105	2702665	1
FL SWITCH 2108	2702666	1

Type	Order No.	Pcs./Pkt.
FL SWITCH 2116	2702908	1

Accessories

Accessories

Accessories

SD FLASH 2GB	2988162	1
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SD FLASH 2GB	2988162	1
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SD FLASH 2GB	2988162	1
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2000 series Managed Switches for universal automation applications

The 2200 and 2300 Managed Switches with enhanced functions offer an optimum range of functions, choice of versions, and approvals for a wide range of applications, e.g., in the maritime sector or process technology.

Features:

- PROFINET device
- Media Redundancy Protocol (MRP) in accordance with IEC 62439
- Extended temperature range (-40°C ... +70°C)
- Redundant power supply
- IGMP snooping/querier
- HTTPS/SNMPv3
- Port-based/pool-based DHCP server, DHCP option 82
- Simple Network Time Protocol (SNTP)
- Preconfigured versions for PROFINET applications
- Gigabit versions support jumbo frames
- MAC-based port security
- RADIUS authentication (IEEE 802.1x)

Notes:

The approvals refer to the first product listed in each column. Detailed information can be found in the product area on our website at phoenixcontact.net/products.



**5/8 RJ45 ports
10/100 Mbps**



Ethernet interface
Number of ports
Transmission speed
Function
Basic functions
Management
Diagnostic function
Redundancy
Status and diagnostic indicators
Power supply
Supply voltage
Residual ripple
Supply voltage range
Typical current consumption
General data
Dimensions
Degree of protection
Ambient temperature (operation)
Permissible humidity (operation)
Noise emission
Noise immunity
EMC note

Technical data	
FL SWITCH 2205	FL SWITCH 2208
5 (RJ45 ports)	8 (RJ45 ports)
10/100 Mbps	
Store-and-forward switch, complies with IEEE 802.3	
Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Command-line interface (Telnet, SSH) RMON History LLDP (Link Layer Discovery Protocol) SNMP-Traps N:1-Portmirroring ACD (Address Conflict Detection) MRP (Media Redundancy Protocol) RSTP (Rapid Spanning Tree Protocol) FRD (Fast Ring Detection) Large Tree Support LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link/Activity and Speed)	
24 V DC (redundant) 3.6 V _{pp} 9 V DC ... 57 V DC 170 mA (at U _S = 24 V DC) 185 mA (at U _S = 24 V DC)	
45 mm / 130 mm / 115 mm IP20 -40°C ... 70°C 10% ... 95% (non-condensing) EN 61000-6-4 EN 61000-6-2 Class A product, see page 527	

Description
Ethernet switch
- 5 RJ45 ports
- 8 RJ45 ports
- 8 RJ45 ports, preconfigured for PROFINET
- 16 RJ45 ports
- 16 RJ45 ports, preconfigured for PROFINET

Ordering data		
Type	Order No.	Pcs./Pkt.
FL SWITCH 2205	2702326	1
FL SWITCH 2208	2702327	1
FL SWITCH 2208 PN	1044024	1

Parameterization memory , Flash card without license

Accessories		
SD FLASH 2GB	2988162	1

PROFI[®]
NET16 RJ45 ports
10/100 MbpsPROFI[®]
NET8 RJ45 ports
10/100/1000 MbpsPROFI[®]
NET16 RJ45 ports
10/100/1000 Mbps

Ex:

Ex: CC-Link IE Field

Ex:

Technical data

16 (RJ45 ports)
10/100 Mbps

Store-and-forward switch, complies with IEEE 802.3

Web-based management (HTTP/HTTPS)
SNMPv1/v2/v3
Command-line interface (Telnet, SSH)
RMON History
LLDP (Link Layer Discovery Protocol)
SNMP-Traps
N:1-Portmirroring
ACD (Address Conflict Detection)
MRP (Media Redundancy Protocol)
RSTP (Rapid Spanning Tree Protocol)
FRD (Fast Ring Detection)
Large Tree Support
LEDs: US1, US2 (power supply), Fail (alarm contact),
2 LEDs per Ethernet port (Link/Activity and Speed)

24 V DC (redundant)
3.6 V_{pp}
12 V DC ... 57 V DC
315 mA (at U_S = 24 V DC)

85 mm / 130 mm / 115 mm
IP20
-40°C ... 70°C
10% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2

Technical data

8 (RJ45 ports)
10/100/1000 Mbps

Store-and-forward switch, complies with IEEE 802.3

Web-based management (HTTP/HTTPS)
SNMPv1/v2/v3
Command-line interface (Telnet, SSH)
RMON History
LLDP (Link Layer Discovery Protocol)
SNMP-Traps
N:1-Portmirroring
ACD (Address Conflict Detection)
MRP (Media Redundancy Protocol)
RSTP (Rapid Spanning Tree Protocol)
FRD (Fast Ring Detection)
Large Tree Support
LEDs: US1, US2 (power supply), Fail (alarm contact),
2 LEDs per Ethernet port (Link/Activity and Speed)

24 V DC (redundant)
3.6 V_{pp}
12 V DC ... 57 V DC
280 mA (at U_S = 24 V DC)

45 mm / 130 mm / 115 mm
IP20
-40°C ... 70°C
10% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2
Class A product, see page 527

Technical data

16 (RJ45 ports)
10/100/1000 Mbps

Store-and-forward switch, complies with IEEE 802.3

Web-based management (HTTP/HTTPS)
SNMPv1/v2/v3
Command-line interface (Telnet, SSH)
RMON History
LLDP (Link Layer Discovery Protocol)
SNMP-Traps
N:1-Portmirroring
ACD (Address Conflict Detection)
MRP (Media Redundancy Protocol)
RSTP (Rapid Spanning Tree Protocol)
FRD (Fast Ring Detection)
Large Tree Support
LEDs: US1, US2 (power supply), Fail (alarm contact),
2 LEDs per Ethernet port (Link/Activity and Speed)

24 V DC (redundant)
3.6 V_{pp}
12 V DC ... 57 V DC
455 mA (at U_S = 24 V DC)

85 mm / 130 mm / 115 mm
IP20
-40°C ... 70°C
10% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2216	2702904	1
FL SWITCH 2216 PN	1044029	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2308	2702652	1
FL SWITCH 2308 PN	1009220	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2316	2702909	1
FL SWITCH 2316 PN	1031673	1

Accessories

SD FLASH 2GB	2988162	1
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Accessories

SD FLASH 2GB	2988162	1
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Accessories

SD FLASH 2GB	2988162	1
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2200 series Managed Switches with fiberglass interfaces

2200 Managed Switches offer a wide range of options for creating networks with fiberglass connections. The range comprises multimode or single mode versions with SC or ST connections and satisfies various approvals for maritime applications and process technology.

Features:

- PROFINET device
- Media Redundancy Protocol (MRP) in accordance with IEC 62439
- Extended temperature range (-40°C ... +70°C)
- Redundant power supply
- IGMP snooping/querier
- HTTPS/SNMPv3
- Port-based/pool-based DHCP server, DHCP option 82
- Simple Network Time Protocol (SNTP)
- Gigabit versions support jumbo frames
- MAC-based port security
- RADIUS authentication (IEEE 802.1x)



**7 RJ45 ports and
1 fiber optic port (multimode)**



Ethernet interface			
Number of ports	7 (RJ45 ports)		
Transmission speed	10/100 Mbps		
Fiber optic interface			
Number of ports	1 (SC multimode)		
Transmission speed	100 Mbps (full duplex)		
Wavelength	1300 nm		
Transmission distance	11000 m (fiberglass with F-G 62.5/125 0.7 dB/km F1000)		
Function			
Basic functions	Store-and-forward switch, complies with IEEE 802.3		
Management	Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Command-line interface (Telnet, SSH)		
Diagnostic function	RMON History LLDP (Link Layer Discovery Protocol) SNMP-Traps N:1-Portmirroring ACD (Address Conflict Detection)		
Redundancy	MRP (Media Redundancy Protocol) RSTP (Rapid Spanning Tree Protocol) FRD (Fast Ring Detection) Large Tree Support		
Status and diagnostic indicators	LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link/Activity and Speed)		
Power supply			
Supply voltage	24 V DC (redundant)		
Residual ripple	3.6 V _{pp}		
Supply voltage range	9 V DC ... 57 V DC		
Typical current consumption	220 mA (at U _S = 24 V DC)		
General data			
Dimensions	W / H / D	45 mm / 130 mm / 115 mm	
Degree of protection	IP20		
Ambient temperature (operation)	-40°C ... 70°C		
Permissible humidity (operation)	10% ... 95% (non-condensing)		
Noise emission	EN 61000-6-4		
Noise immunity	EN 61000-6-2		
EMC note	Class A product, see page 527		
Ordering data			
Description	Type	Order No.	Pcs./Pkt.
Ethernet switch	FL SWITCH 2207-FX	2702328	1
- 7 RJ45 ports, 1 SC FO port			
- 6 RJ45 ports, 2 SC FO ports			
- 6 RJ45 ports, 2 ST FO ports			
Accessories			
Parameterization memory, Flash card without license	SD FLASH 2GB	2988162	1

PROFI[®]
NET

**7 RJ45 ports and
1 fiber optic port (single mode)**

PROFI[®]
NET

**6 RJ45 ports and
2 fiber optic ports (multimode)**

PROFI[®]
NET

**6 RJ45 ports and
2 fiber optic ports (single mode)**



Technical data

7 (RJ45 ports)
10/100 Mbps

1 (SC single mode)
100 Mbps (full duplex)
1300 nm
36000 m (fiberglass with F-G 9/125 0.36 dB/km)

Store-and-forward switch, complies with IEEE 802.3

Web-based management (HTTP/HTTPS)
SNMPv1/v2/v3
Command-line interface (Telnet, SSH)
RMON History
LLDP (Link Layer Discovery Protocol)
SNMP-Traps
N:1-Portmirroring
ACD (Address Conflict Detection)
MRP (Media Redundancy Protocol)
RSTP (Rapid Spanning Tree Protocol)
FRD (Fast Ring Detection)
Large Tree Support
LEDs: US1, US2 (power supply), Fail (alarm contact),
2 LEDs per Ethernet port (Link/Activity and Speed)

24 V DC (redundant)
3.6 V_{pp}
9 V DC ... 57 V DC
210 mA (at U_S = 24 V DC)

45 mm / 130 mm / 115 mm
IP20
-40°C ... 70°C
10% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2

Class A product, see page 527

Technical data

FL SWITCH 2206-2FX FL SWITCH 2206-2FX ST

6 (RJ45 ports)
10/100 Mbps

2 (SC multimode) 2 (ST multimode)
100 Mbps (full duplex)
1300 nm
11000 m (fiberglass with F-G 62.5/125 0.7 dB/km F1000)

Store-and-forward switch, complies with IEEE 802.3

Web-based management (HTTP/HTTPS)
SNMPv1/v2/v3
Command-line interface (Telnet, SSH)
RMON History
LLDP (Link Layer Discovery Protocol)
SNMP-Traps
N:1-Portmirroring
ACD (Address Conflict Detection)
MRP (Media Redundancy Protocol)
RSTP (Rapid Spanning Tree Protocol)
FRD (Fast Ring Detection)
Large Tree Support
LEDs: US1, US2 (power supply), Fail (alarm contact),
2 LEDs per Ethernet port (Link/Activity and Speed)

24 V DC (redundant)
3.6 V_{pp}
9 V DC ... 57 V DC
255 mA (at U_S = 24 V DC)

45 mm / 130 mm / 115 mm
IP20
-40°C ... 70°C
10% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2

Class A product, see page 527

Technical data

FL SWITCH 2206-2FX SM FL SWITCH 2206-2FX SM ST

6 (RJ45 ports)
10/100 Mbps

2 (SC single mode) 2 (ST single mode)
100 Mbps (full duplex)
1300 nm
36000 m (fiberglass with F-G 9/125 0.36 dB/km)

Store-and-forward switch, complies with IEEE 802.3

Web-based management (HTTP/HTTPS)
SNMPv1/v2/v3
Command-line interface (Telnet, SSH)
RMON History
LLDP (Link Layer Discovery Protocol)
SNMP-Traps
N:1-Portmirroring
ACD (Address Conflict Detection)
MRP (Media Redundancy Protocol)
RSTP (Rapid Spanning Tree Protocol)
FRD (Fast Ring Detection)
Large Tree Support
LEDs: US1, US2 (power supply), Fail (alarm contact),
2 LEDs per Ethernet port (Link/Activity and Speed)

24 V DC (redundant)
3.6 V_{pp}
9 V DC ... 57 V DC
235 mA (at U_S = 24 V DC)

45 mm / 130 mm / 115 mm
IP20
-40°C ... 70°C
10% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2

Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2207-FX SM	2702329	1

Accessories

SD FLASH 2GB	2988162	1
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Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2206-2FX	2702330	1
FL SWITCH 2206-2FX ST	2702332	1

Accessories

SD FLASH 2GB	2988162	1
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Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2206-2FX SM	2702331	1
FL SWITCH 2206-2FX SM ST	2702333	1

Accessories

SD FLASH 2GB	2988162	1
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2000 series Managed Switches with fiberglass interfaces

The 2200 Managed Switches offer a wide range of options for creating networks with fiberglass connections. The portfolio includes multimode or single mode versions with SC connections and satisfies various approvals for maritime applications and process technology.



**14 RJ45 ports and
2 fiber optic ports (multimode)**



**14 RJ45 ports and
2 fiber optic ports (single mode)**



Technical data		Technical data	
Ethernet interface			
Number of ports	14 (RJ45 ports)	14 (RJ45 ports)	
Transmission speed	10/100 Mbps	10/100 Mbps	
Fiber optic interface			
Number of ports	2 (SC multimode)	2 (SC single mode)	
Transmission speed	100 Mbps (full duplex)	100 Mbps (full duplex)	
Wavelength	1300 nm	1300 nm	
Transmission distance	11000 m (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	36000 m (fiberglass with F-G 9/125 0.36 dB/km)	
Function			
Basic functions	Store-and-forward switch, complies with IEEE 802.3	Store-and-forward switch, complies with IEEE 802.3	
Management	Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Command-line interface (Telnet, SSH)	Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Command-line interface (Telnet, SSH)	
Diagnostic function	RMON History LLDP (Link Layer Discovery Protocol) SNMP-Traps N:1-Portmirroring ACD (Address Conflict Detection)	RMON History LLDP (Link Layer Discovery Protocol) SNMP-Traps N:1-Portmirroring ACD (Address Conflict Detection)	
Redundancy	MRP (Media Redundancy Protocol) RSTP (Rapid Spanning Tree Protocol) FRD (Fast Ring Detection) Large Tree Support	MRP (Media Redundancy Protocol) RSTP (Rapid Spanning Tree Protocol) FRD (Fast Ring Detection) Large Tree Support	
Status and diagnostic indicators	LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link/Activity and Speed)	LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link/Activity and Speed)	
Power supply			
Supply voltage	24 V DC (redundant)	24 V DC (redundant)	
Residual ripple	3.6 V _{pp}	3.6 V _{pp}	
Supply voltage range	12 V DC ... 57 V DC	12 V DC ... 57 V DC	
Typical current consumption	375 mA (at U _S = 24 V DC)	375 mA (at U _S = 24 V DC)	
General data			
Dimensions	W / H / D 85 mm / 130 mm / 115 mm	85 mm / 130 mm / 115 mm	
Degree of protection	IP20	IP20	
Ambient temperature (operation)	-40°C ... 70°C	-40°C ... 70°C	
Permissible humidity (operation)	10% ... 95% (non-condensing)	10% ... 95% (non-condensing)	
Noise emission	EN 61000-6-4	EN 61000-6-4	
Noise immunity	EN 61000-6-2	EN 61000-6-2	
EMC note	Class A product, see page 527	Class A product, see page 527	
Ordering data		Ordering data	
Description	Type	Order No.	Pcs./Pkt.
Ethernet switch	FL SWITCH 2214-2FX	2702905	1
	FL SWITCH 2214-2FX SM	2702906	1
Accessories		Accessories	
Parameterization memory, Flash card without license	SD FLASH 2GB	2988162	1

2000 series Managed Switches with SFP fiberglass connections

2200 and 2300 Managed Switches with SFP ports guarantee maximum flexibility in applications. Depending on the chosen SFP module, cable lengths of up to 80 km are possible.

PROFINET


6 RJ45 ports and 2 SFP ports
10/100 Mbps



Ex:

PROFINET


6 RJ45 ports and 2 SFP ports
10/100/1000 Mbps



Ex:

Ethernet interface
Number of ports
Transmission speed
Fiber optic interface
Number of ports
Transmission speed
Transmission distance

Function
Basic functions

Management

Diagnostic function

Redundancy

Status and diagnostic indicators

Power supply
Supply voltage
Residual ripple
Supply voltage range
Typical current consumption

General data
Dimensions
Degree of protection
Ambient temperature (operation)
Permissible humidity (operation)
Noise emission
Noise immunity
EMC note

Technical data

6 (RJ45 ports)
10/100 Mbps

2 (SFP ports)
100 Mbps (full duplex)
up to 40 km (depending on the fiber/SFP module used)

Store-and-forward switch, complies with IEEE 802.3
--

Web-based management (HTTP/HTTPS)
SNMPv1/v2/v3
Command-line interface (Telnet, SSH)
RMON History
LLDP (Link Layer Discovery Protocol)
SNMP-Traps
ACD (Address Conflict Detection)
N:1-Portmirroring
MRP (Media Redundancy Protocol)
RSTP (Rapid Spanning Tree Protocol)
FRD (Fast Ring Detection)
Large Tree Support
LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link/Activity and Speed)

Technical data

6 (RJ45 ports)
10/100/1000 Mbps

2 (SFP ports)
100/1000 Mbps (full duplex)
up to 80 km (depending on the fiber/SFP module used)

Store-and-forward switch, complies with IEEE 802.3
--

Web-based management (HTTP/HTTPS)
SNMPv1/v2/v3
Command-line interface (Telnet, SSH)
RMON History
LLDP (Link Layer Discovery Protocol)
SNMP-Traps
ACD (Address Conflict Detection)
N:1-Portmirroring
MRP (Media Redundancy Protocol)
RSTP (Rapid Spanning Tree Protocol)
FRD (Fast Ring Detection)
Large Tree Support
LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link/Activity and Speed)

Description

Ethernet switch

- Preconfigured for PROFINET

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2206-2SFX	2702969	1
FL SWITCH 2206-2SFX PN	1044028	1

Accessories

SD FLASH 2GB	2988162	1
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See page 332

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2306-2SFP	2702970	1
FL SWITCH 2306-2SFP PN	1009222	1

Accessories

SD FLASH 2GB	2988162	1
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See page 332

2000 series Managed Switches with SFP fiberglass connections

2200 and 2300 Managed Switches with SFP ports guarantee maximum flexibility in applications. Depending on the chosen SFP module, cable lengths of up to 80 km are possible.

Features:

- PROFINET device
- Media Redundancy Protocol (MRP) in accordance with IEC 62439
- Extended temperature range (-40°C ... +70°C)
- Redundant power supply
- IGMP snooping/querier
- HTTPS/SNMPv3
- Port-based/pool-based DHCP server, DHCP option 82
- Simple Network Time Protocol (SNTP)
- Preconfigured versions for PROFINET applications
- Gigabit versions support jumbo frames
- MAC-based port security
- RADIUS authentication (IEEE 802.1x)



**14 RJ45 ports and 2 SFP ports
10/100 Mbps**



Ethernet interface	
Number of ports	14 (RJ45 ports)
Transmission speed	10/100 Mbps
Fiber optic interface	
Number of ports	2 (SFP ports)
Transmission speed	100 Mbps (full duplex)
Transmission distance	up to 40 km (depending on the fiber/SFP module used)
Fiber optic interface	
Number of ports	-
Transmission speed	-
Transmission distance	-
Function	
Basic functions	Store-and-forward switch, complies with IEEE 802.3
Management	Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Command-line interface (Telnet, SSH)
Diagnostic function	RMON History LLDP (Link Layer Discovery Protocol) SNMP-Traps N:1-Portmirroring ACD (Address Conflict Detection) MRP (Media Redundancy Protocol) RSTP (Rapid Spanning Tree Protocol) FRD (Fast Ring Detection) Large Tree Support
Redundancy	LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link/Activity and Speed)
Status and diagnostic indicators	
Power supply	
Supply voltage	24 V DC (redundant)
Residual ripple	3.6 V _{pp}
Supply voltage range	12 V DC ... 57 V DC
Typical current consumption	325 mA (at U _S = 24 V DC)
General data	
Dimensions	W / H / D 85 mm / 130 mm / 115 mm
Degree of protection	IP20
Ambient temperature (operation)	-40°C ... 70°C
Permissible humidity (operation)	10% ... 95% (non-condensing)
Noise emission	EN 61000-6-4
Noise immunity	EN 61000-6-2
EMC note	

Description
Ethernet switch
- Preconfigured for PROFINET

Parameterization memory, Flash card without license
SFP module

Technical data

14 (RJ45 ports)
10/100 Mbps
2 (SFP ports)
100 Mbps (full duplex)
up to 40 km (depending on the fiber/SFP module used)
-
-
-
Store-and-forward switch, complies with IEEE 802.3
Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Command-line interface (Telnet, SSH) RMON History LLDP (Link Layer Discovery Protocol) SNMP-Traps N:1-Portmirroring ACD (Address Conflict Detection) MRP (Media Redundancy Protocol) RSTP (Rapid Spanning Tree Protocol) FRD (Fast Ring Detection) Large Tree Support LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link/Activity and Speed)
24 V DC (redundant)
3.6 V _{pp}
12 V DC ... 57 V DC
325 mA (at U _S = 24 V DC)
85 mm / 130 mm / 115 mm
IP20
-40°C ... 70°C
10% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2214-2SFX	1006188	1
FL SWITCH 2214-2SFX PN	1044030	1

Accessories

SD FLASH 2GB	2988162	1
See page 332		

PROFI[®]
NET

14 RJ45 ports and 2 SFP ports
10/100/1000 Mbps

Ex:

PROFI[®]
NET

**4 / 12 RJ45 ports, 2 SFP ports,
and 2 Fast Ethernet combo ports**
10/100 Mbps

Ex:

PROFI[®]
NET

**4 / 12 RJ45 ports, 2 SFP ports,
and 2 Gigabit combo ports**
10/100/1000 Mbps

Ex:

Technical data

14 (RJ45 ports)
10/100/1000 Mbps

2 (SFP ports)
100/1000 Mbps (full duplex)
up to 80 km (depending on the fiber/SFP module used)

-
-
-

Store-and-forward switch, complies with IEEE 802.3

Web-based management (HTTP/HTTPS)
SNMPv1/v2/v3
Command-line interface (Telnet, SSH)
RMON History
LLDP (Link Layer Discovery Protocol)
SNMP-Traps
N:1-Portmirroring
ACD (Address Conflict Detection)
MRP (Media Redundancy Protocol)
RSTP (Rapid Spanning Tree Protocol)
FRD (Fast Ring Detection)
Large Tree Support
LEDs: US1, US2 (power supply), Fail (alarm contact),
2 LEDs per Ethernet port (link/activity and speed),
PROFINET status LEDs (BF, SF)

24 V DC (redundant)
3.6 V_{PP}
12 V DC ... 57 V DC
460 mA (at U_S = 24 V DC)

85 mm / 130 mm / 115 mm
IP20
-40°C ... 70°C
10% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2314-2SFP	1006191	1
FL SWITCH 2314-2SFP PN	1031683	1

Accessories

SD FLASH 2GB	2988162	1
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See page 332

Technical data

FL SWITCH 2204-2TC-2SFX FL SWITCH 2212-2TC-2SFX

4 (RJ45 ports) 12 (RJ45 ports)
10/100 Mbps

2 (SFP ports)
100 Mbps (full duplex)
up to 40 km (depending on the fiber/SFP module used)

2 (Combo ports)
10/100 Mbps (full duplex)
up to 40 km (depending on the fiber/SFP module used)

Store-and-forward switch, complies with IEEE 802.3

Web-based management (HTTP/HTTPS)
SNMPv1/v2/v3
Command-line interface (Telnet, SSH)
RMON History
LLDP (Link Layer Discovery Protocol)
SNMP-Traps
N:1-Portmirroring
ACD (Address Conflict Detection)
MRP (Media Redundancy Protocol)
RSTP (Rapid Spanning Tree Protocol)
FRD (Fast Ring Detection)
Large Tree Support
LEDs: US1, US2 (power supply), Fail (alarm contact),
2 LEDs per Ethernet port (Link/Activity and Speed)

24 V DC (redundant)
3.6 V_{PP}
12 V DC ... 57 V DC
250 mA (at U_S = 24 V DC) 360 mA (at U_S = 24 V DC)

45 mm / 130 mm / 115 mm 85 mm / 130 mm / 115 mm
IP20
-40°C ... 70°C
10% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2204-2TC-2SFX	2702334	1
FL SWITCH 2212-2TC-2SFX	2702907	1

Accessories

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See page 332

Technical data

FL SWITCH 2304-2GC-2SFP FL SWITCH 2312-2GC-2SFP

4 (RJ45 ports) 12 (RJ45 ports)
10/100/1000 Mbps

2 (SFP ports)
100/1000 Mbps (full duplex)
up to 80 km (depending on the fiber/SFP module used)

2 (Combo ports)
10/100/1000 Mbps (full duplex)
up to 80 km (depending on the fiber/SFP module used)

Store-and-forward switch, complies with IEEE 802.3

Web-based management (HTTP/HTTPS)
SNMPv1/v2/v3
Command-line interface (Telnet, SSH)
RMON History
LLDP (Link Layer Discovery Protocol)
SNMP-Traps
N:1-Portmirroring
ACD (Address Conflict Detection)
MRP (Media Redundancy Protocol)
RSTP (Rapid Spanning Tree Protocol)
FRD (Fast Ring Detection)
Large Tree Support
LEDs: US1, US2 (power supply), Fail (alarm contact),
2 LEDs per Ethernet port (Link/Activity and Speed)

24 V DC (redundant)
3.6 V_{PP}
12 V DC ... 57 V DC
290 mA (at U_S = 24 V DC) 475 mA (at U_S = 24 V DC)

45 mm / 130 mm / 115 mm 85 mm / 130 mm / 115 mm
IP20
-40°C ... 70°C
10% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 2304-2GC-2SFP	2702653	1
FL SWITCH 2312-2GC-2SFP	2702910	1

Accessories

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See page 332

3000 series Managed Switches

The **FL SWITCH 3000** industrial Managed Switches provide scalable power for application flexibility and ease of use.

Features:

- Standard devices (-10°C ... +60°C) and devices with wide temperature range (-40°C ... +75°C) available
- Extended Ring Redundancy provides a 15 ms recovery time
- Extensive IEEE and security functions



5/8 RJ45 ports



16 RJ45 ports



Technical data	
FL SWITCH 3005	FL SWITCH 3008T
Ethernet interface	
Number of ports	5 (RJ45 ports) 8 (RJ45 ports)
Transmission speed	10/100 Mbps
Fiber optic interface	
Number of ports	-
Transmission speed	-
Wavelength	-
Transmission distance	-
Function	
Basic functions	Store and forward switch, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNMP, web customization, user accounts
Status and diagnostic indicators	LEDs: U _{S1} , U _{S2} (redundant voltage supply), link and activity per port
Power supply	
Supply voltage	24 V DC (redundant)
Residual ripple	3.6 V _{pp}
Supply voltage range	12 V DC ... 48 V DC
Typical current consumption	200 mA (at U _S = 24 V DC) 210 mA (at U _S = 24 V DC)
General data	
Dimensions	54.4 mm / 146.4 mm / 125 mm
Degree of protection	IP20
Ambient temperature (operation)	-10°C ... 60°C -40°C ... 75°C
Permissible humidity (operation)	5% ... 95% (non-condensing)
Noise emission	EN 61000-6-4
Noise immunity	EN 61000-6-2:2005
EMC note	Class A product, see page 527



Technical data	
FL SWITCH 3016	FL SWITCH 3016T
Ethernet interface	
Number of ports	16 (RJ45 ports)
Transmission speed	10/100 Mbps
Fiber optic interface	
Number of ports	-
Transmission speed	-
Wavelength	-
Transmission distance	-
Function	
Basic functions	Store and forward switch, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNMP, web customization, user accounts
Status and diagnostic indicators	LEDs: U _{S1} , U _{S2} (redundant voltage supply), link and activity per port
Power supply	
Supply voltage	24 V DC (redundant)
Residual ripple	3.6 V _{pp}
Supply voltage range	12 V DC ... 48 V DC
Typical current consumption	312 mA (at U _S = 24 V DC)
General data	
Dimensions	66 mm / 173 mm / 140 mm
Degree of protection	IP20
Ambient temperature (operation)	-10°C ... 60°C -40°C ... 75°C
Permissible humidity (operation)	5% ... 95% (non-condensing)
Noise emission	EN 61000-6-4
Noise immunity	EN 61000-6-2:2005
EMC note	Class A product, see page 527

Ordering data			
Type	Order No.	Pcs./Pkt.	
FL SWITCH 3005	2891030	1	
FL SWITCH 3008	2891031	1	
FL SWITCH 3005T	2891032	1	
FL SWITCH 3008T	2891035	1	

Ordering data			
Type	Order No.	Pcs./Pkt.	
FL SWITCH 3016	2891058	1	
FL SWITCH 3016T	2891059	1	

Description
Ethernet switch
- 5 RJ45 ports
- 8 RJ45 ports
- 16 RJ45 ports
Ethernet switch, wide temperature
- 5 RJ45 ports
- 8 RJ45 ports
- 16 RJ45 ports
- 4 RJ45 ports, 1 SC FO port
- 4 RJ45 ports, 1 ST FO port
- 6 RJ45 ports, 2 SC FO ports
- 6 RJ45 ports, 2 ST FO ports



**4 RJ45 ports and
1 fiber optic port (multimode)**



**6 RJ45 ports and
2 fiber optic ports (multimode)**



**6 RJ45 ports and
2 fiber optic ports (single mode)**



Technical data

FL SWITCH 3004T-FX FL SWITCH 3004T-FX ST

4 (RJ45 ports)
10/100 Mbps

1 (SC multimode) 1 (ST multimode)
100 Mbps (full duplex)
1300 nm

12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)

Store and forward switch, Extended Ring and IEEE redundancy,
Multicast control, IGMP snooping, trunking, Port and Tagging VLANs,
Port and IEEE 802.1x security, SNMP V3 and Https security,
SNTP, web customization, user accounts

LEDs: U_{S1} , U_{S2} (redundant voltage supply), link and activity per port

24 V DC (redundant)
3.6 V_{pp}
12 V DC ... 48 V DC
330 mA (at $U_S = 24$ V DC)

54.4 mm / 146.4 mm / 125 mm
IP20
-40°C ... 75°C
5% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2:2005
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 3004T-FX	2891033	1
FL SWITCH 3004T-FX ST	2891034	1

Technical data

FL SWITCH 3006T-2FX FL SWITCH 3006T-2FX ST

6 (RJ45 ports)
10/100 Mbps

2 (SC multimode) 2 (ST multimode)
100 Mbps (full duplex)
1300 nm

12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)

Store and forward switch, Extended Ring and IEEE redundancy,
Multicast control, IGMP snooping, trunking, Port and Tagging VLANs,
Port and IEEE 802.1x security, SNMP V3 and Https security,
SNTP, web customization, user accounts

LEDs: U_{S1} , U_{S2} (redundant voltage supply), link and activity per port

24 V DC (redundant)
3.6 V_{pp}
12 V DC ... 48 V DC
330 mA (at $U_S = 24$ V DC)

54.4 mm / 146.4 mm / 125 mm
IP20
-40°C ... 75°C
5% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2:2005
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 3006T-2FX	2891036	1
FL SWITCH 3006T-2FX ST	2891037	1

Technical data

6 (RJ45 ports)
10/100 Mbps

2 (SC single mode)
100 Mbps (full duplex)
1300 nm

40 km (fiberglass with F-G 9/125 0.36 dB/km)

Store and forward switch, Extended Ring and IEEE redundancy,
Multicast control, IGMP snooping, trunking, Port and Tagging VLANs,
Port and IEEE 802.1x security, SNMP V3 and Https security,
SNTP, web customization, user accounts

LEDs: U_{S1} , U_{S2} (redundant voltage supply), link and activity per port

24 V DC (redundant)
3.6 V_{pp}
12 V DC ... 48 V DC
330 mA (at $U_S = 24$ V DC)

54.4 mm / 146.4 mm / 125 mm
IP20
-40°C ... 75°C
5% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2:2005
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 3006T-2FX SM	2891060	1

Managed Switches for IEC 61850 applications

The 3000E Managed Switches are particularly suitable for use in energy systems and meet the stringent requirements of standards IEC 61850-3 and IEEE 1613. They provide round-the-clock reliable operation under extreme environmental conditions thanks to their very high immunity to electromagnetic and electrostatic interference.

Features:

- Extended temperature range (-40°C ... +75°C)
- High shock and vibration resistance
- Extended Ring Redundancy provides a 15 ms recovery time
- Extensive IEEE and security functions

IEC 61850-3



16 RJ45 ports



Technical data

Ethernet interface	
Number of ports	16 (RJ45 ports)
Transmission speed	10/100 Mbps
Fiber optic interface	
Number of ports	-
Transmission speed	-
Wavelength	-
Transmission distance	-
Function	
Basic functions	Store and forward switch, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNTP, web customization, user accounts
Status and diagnostic indicators	LEDs: U _{S1} , U _{S2} (redundant voltage supply), link and activity per port
Network expansion parameters	
Cascading depth	Network, linear, and star structure: any
Maximum cable length (twisted pair)	100 m
Power supply	
Supply voltage	24 V DC (redundant)
Residual ripple	3.6 V _{pp}
Supply voltage range	12 V DC ... 48 V DC
Typical current consumption	312 mA (at U _S = 24 V DC)
General data	
Dimensions	W / H / D 78.6 mm / 145 mm / 125 mm
Degree of protection	IP20
Ambient temperature (operation)	-40°C ... 70°C
Permissible humidity (operation)	5% ... 95% (non-condensing)
Noise emission	EN 61000-6-4
Noise immunity	IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005
EMC note	Class A product, see page 527

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Managed Switch - 16 RJ45 ports - 12 RJ45 ports, 2 SC FO ports - 12 RJ45 ports, 2 SFP FO ports	FL SWITCH 3016E	2891066	1

Accessories

Redundancy module - 3 RJ45 ports - 1 RJ45 port, 2 LC fiber optic ports (multimode)	FL RED 2003E PRP	2701863	1
	FL RED 2001E PRP 2LC	2701864	1
SFP module			

IEC 61850-3

12 RJ45 ports and
2 fiber optic ports (multimode)

IEC 61850-3

12 RJ45 ports and
2 fiber optic ports (single mode)

IEC 61850-3



12 RJ45 ports and 2 SFP ports



Technical data
12 (RJ45 ports) 10/100 Mbps
2 (SC multimode) 100 Mbps (full duplex) 1300 nm 8 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)
Store and forward switch, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNTP, web customization, user accounts
LEDs: U _{S1} , U _{S2} (redundant voltage supply), link and activity per port
Network, linear, and star structure: any 100 m
24 V DC (redundant) 3.6 V _{PP} 12 V DC ... 48 V DC 354 mA (at U _S = 24 V DC)
78.6 mm / 145 mm / 125 mm IP20 -40°C ... 70°C 5% ... 95% (non-condensing) EN 61000-6-4 IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005 Class A product, see page 527

Ordering data		
Type	Order No.	Pcs./Pkt.
FL SWITCH 3012E-2FX	2891120	1

Accessories		
FL RED 2003E PRP	2701863	1
FL RED 2001E PRP 2LC	2701864	1

Technical data
12 (RJ45 ports) 10/100 Mbps
2 (SC single mode) 100 Mbps (full duplex) 1300 nm 40 km (fiberglass with F-G 9/125 0.36 dB/km)
Store and forward switch, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNTP, web customization, user accounts
LEDs: U _{S1} , U _{S2} (redundant voltage supply), link and activity per port
Network, linear, and star structure: any 100 m
24 V DC (redundant) 3.6 V _{PP} 12 V DC ... 48 V DC 320 mA (at U _S = 24 V DC)
78.6 mm / 145 mm / 125 mm IP20 -40°C ... 70°C 5% ... 95% (non-condensing) EN 61000-6-4 IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005 Class A product, see page 527

Ordering data		
Type	Order No.	Pcs./Pkt.
FL SWITCH 3012E-2FX SM	2891119	1

Accessories		
FL RED 2003E PRP	2701863	1
FL RED 2001E PRP 2LC	2701864	1

Technical data
12 (RJ45 ports) 10/100 Mbps
2 (SFP ports) 100 Mbps (full duplex) - up to 40 km (depending on the fiber/SFP module used)
Store and forward switch, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNTP, web customization, user accounts
LEDs: U _{S1} , U _{S2} (redundant voltage supply), link and activity per port
Network, linear, and star structure: any 100 m
24 V DC (redundant) 3.6 V _{PP} 12 V DC ... 48 V DC 312 mA (at U _S = 24 V DC)
78.6 mm / 145 mm / 125 mm IP20 -40°C ... 70°C 5% ... 95% (non-condensing) EN 61000-6-4 IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005 Class A product, see page 527

Ordering data		
Type	Order No.	Pcs./Pkt.
FL SWITCH 3012E-2SFX	2891067	1

Accessories		
FL RED 2003E PRP	2701863	1
FL RED 2001E PRP 2LC	2701864	1

See page 332

Managed Switches

4000 series Managed Switches with Gigabit uplink ports

The **FL SWITCH 4000** Managed Switches feature flexible, scalable performance while maintaining ease of operation.

Features:

- 2 Gigabit ports for high-performance data trunk lines
- Extended temperature range (-40°C ... +75°C)
- Extended Ring Redundancy provides a 15 ms recovery time
- Flexible fiberglass interface options



8 RJ45 ports and 2 SFP ports



10 / 14 RJ45 ports and 4 / 2 FO ports



Technical data

Ethernet interface	
Number of ports	8 (RJ45 ports)
Transmission speed	10/100 Mbps
Gigabit Ethernet interface	
Number of ports	-
Transmission speed	-
Fiber optic interface	
Number of ports	2 (SFP ports)
Transmission speed	1000 Mbps (full duplex)
Wavelength	-
Transmission distance	up to 80 km (depending on the fiber/SFP module used)
Function	
Basic functions	Store and forward switch, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNMP, web customization, user accounts
Status and diagnostic indicators	LEDs: U _{S1} , U _{S2} (redundant voltage supply), link and activity per port
Power supply	
Supply voltage	24 V DC (hazardous locations)
Residual ripple	3.6 V _{pp}
Supply voltage range	12 V DC ... 48 V DC (ordinary locations)
Typical current consumption	278 mA (at U _S = 24 V DC)
General data	
Dimensions	W / H / D 54.4 mm / 146.4 mm / 125 mm
Degree of protection	IP20
Ambient temperature (operation)	-40°C ... 75°C
Permissible humidity (operation)	5% ... 95% (non-condensing)
Noise emission	EN 61000-6-4
Noise immunity	EN 61000-6-2:2005
EMC note	Class A product, see page 527

Technical data

FL SWITCH 4008T-2GT-4FX SM	FL SWITCH 4012T-2GT-2FX
8 (RJ45 ports)	12 (RJ45 ports)
	10/100 Mbps
	2 (RJ45 ports)
	10/100/1000 Mbps
4 (SC single mode)	2 (SC multimode)
	100 Mbps (full duplex)
	1300 nm
40 km (fiberglass with F-G 9/125 0.36 dB/km)	8 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)
Store and forward switch, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNMP, web customization, user accounts	Store and forward switch, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNMP, web customization, user accounts
LEDs: U _{S1} , U _{S2} (redundant voltage supply), link and activity per port	LEDs: U _{S1} , U _{S2} (redundant voltage supply), link and activity per port
24 V DC (redundant)	
3.6 V _{pp}	
12 V DC ... 48 V DC	
488 mA (at U _S = 24 V DC)	474 mA (at U _S = 24 V DC)
66 mm / 173 mm / 140 mm	
IP20	
-40°C ... 75°C	
5% ... 95% (non-condensing)	
EN 61000-6-4	
EN 61000-6-2:2005	
Class A product, see page 527	

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Ethernet switch , wide temperature			
- 8 RJ45 ports, 2 SFP FO ports, 1000 Mbps	FL SWITCH 4008T-2SFP	2891062	1
- 10 RJ45 ports, 4 SC FO ports (single mode)			
- 14 RJ45 ports, 2 SC FO ports (multimode)			

Accessories

SFP module	See page 332
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Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 4008T-2GT-4FX SM	2891061	1
FL SWITCH 4012T-2GT-2FX	2891063	1

Accessories

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Managed Power over Ethernet Switches

The 4000 series Managed PoE Switches enable you to connect up to 16 network devices. Up to eight end devices can be supplied with power and data via the same Ethernet cable.

Features:

- Up to 60 W per port
- PoE configuration options (watchdog, scheduler, etc.)
- Jumbo frame support



4 / 8 RJ45 PoE ports and 1 / 2 SFP ports



8 RJ45 PoE ports, 4 RJ45 ports, and 4 SFP ports

**Technical data**

FL SWITCH 4000T-4POE-SFP FL SWITCH 4000T-8POE-2SFP

Ethernet interface	
Number of ports	-
Transmission speed	-
Ethernet interface (PoE)	
Number of ports	4 (RJ45 ports)
Transmission speed	10/100 Mbps
Connection method	RJ45
Fiber optic interface	
Number of ports	1 (SFP port)
Transmission speed	100/1000 Mbps (full duplex)
Wavelength	-
Transmission distance	up to 80 km (depending on the fiber/SFP module used)
Function	
Basic functions	Store and forward switch, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNTP, web customization, user accounts, Modbus/TCP, PoE in accordance with IEEE 802.3at/af.
Status and diagnostic indicators	LEDs: U _{S1} , U _{S2} (redundant voltage supply), Alarm (alarm contact), Link/Activity and PoE per Ethernet port
Power supply	
Supply voltage	55 V DC (redundant)
Residual ripple	3.6 V _{PP}
Supply voltage range	46 V DC ... 57 V DC (> 52 V DC for PoE+ or 60 W output recommended)
Typical current consumption	142 mA (U _S = 55 V DC)
General data	
Dimensions	W / H / D
Degree of protection	IP30
Ambient temperature (operation)	-40°C ... 75°C
Permissible humidity (operation)	5% ... 95% (non-condensing)
Noise emission	EN 61000-6-4
Noise immunity	EN 61000-6-2:2005
EMC note	Class A product, see page 527

Ordering data

Description
- 4 RJ45 PoE ports, 1 SFP port
- 8 RJ45 PoE ports, 2 SFP ports
- 8 RJ45 PoE ports, 4 RJ45 ports, 4 SFP ports

Type	Order No.	Pcs./Pkt.
FL SWITCH 4000T-4POE-SFP	1026924	1
FL SWITCH 4000T-8POE-2SFP	1026923	1

Accessories

SFP module

See page 332

**Technical data**

4 (RJ45 ports)
10/100/1000 Mbps
8 (RJ45 ports)
10/100/1000 Mbps
RJ45
4 (SFP ports)
1000 Mbps (full duplex)
-
up to 80 km (depending on the fiber/SFP module used)
Store and forward switch, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNTP, web customization, user accounts, Modbus/TCP, PoE in accordance with IEEE 802.3at/af.
LEDs: U _{S1} , U _{S2} (redundant voltage supply), Alarm (alarm contact), Link/Activity and PoE per Ethernet port
55 V DC (redundant)
3.6 V _{PP}
46 V DC ... 57 V DC
(> 52 V DC for PoE+ or 60 W output recommended)
301 mA (U _S = 55 V DC)
68 mm / 170 mm / 152 mm
IP30
-40°C ... 75°C
5% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2:2005
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 4004T-8POE-4SFP	1026922	1

Accessories

See page 332

Managed Switches, 19" rack-mount

The FL SWITCH 4800E series of Managed Switches for the automation of energy systems combine 24 ports of 10/100 Mbps device connections with four 10/100/1000 Mbps uplink ports for a total of 28 ports. Application flexibility is ensured with different combinations of copper/fiberglass and fiber types, Gigabit fiberglass/copper "combination" ports, and modular power supply units. Operation in extreme environments is ensured with a wide temperature range and an electrical noise immunity up to four times that of normal industrial switches.

Features:

- All switches have four Gigabit combo ports for network connections with high data throughput
- Flexible cabling using eight or 24 10/100 Mbps RJ45 connections with up to 16 fiberglass connections (100 Mbps)
- Extended Ring Redundancy provides a 15 ms recovery time
- Optional PRP redundancy modules provide a 0 ms recovery time
- Extensive IEEE and security functions
- Unique web customization, diagnostic viewing mode, and help pages simplify maintenance
- Supports up to two modular, hot-swappable power supplies for maximum power flexibility and uptime
- Electrical noise immunity in accordance with IEC 61850-3 and IEEE 1613
- Extended temperature range (-40°C ... +70°C)

Notes:

¹⁾ Requires the installation of at least one FL SWITCH 4800E-P1 or FL SWITCH 4800E-P5 for operation.

IEC 61850-3



24 RJ45 ports and
4 Gigabit combo (SFP or RJ45) ports



Technical data

Ethernet interface	
Number of ports	24 (RJ45 ports)
Transmission speed	10/100 Mbps
Ethernet (RJ45/FO combo)	
Interface	Ethernet (RJ45/FO combo)
Connection method	Combo
Note on the connection method	Auto negotiation and autocrossing (RJ45 interface)
Fiber optic interface	
Number of ports	-
Transmission speed	-
Connection method	-
Transmission distance	-
Function	
Basic functions	Store and forward switch, Extended Ring and IEEE redundancy, Multicast control, IGMP snooping, trunking, Port and Tagging VLANs, Port and IEEE 802.1x security, SNMP V3 and Https security, SNTP, web customization, user accounts
Status and diagnostic indicators	LEDs: U _{S1} , U _{S2} (redundant voltage supply), link and activity per port
Network expansion parameters	
Cascading depth	Network, linear, and star structure: any
Maximum cable length (twisted pair)	100 m
Power supply	
Power supply connection	From FL SWITCH 4800E-P...
General data	
Dimensions	W / H / D 442 mm / 44 mm / 375 mm
Degree of protection	IP20
Ambient temperature (operation)	-40°C ... 70°C
Permissible humidity (operation)	5% ... 95% (non-condensing)
Noise emission	EN 61000-6-4
Noise immunity	IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005
EMC note	Class A product, see page 527

Description

- Managed Switch**, 19-inch rack mounted
- 24 RJ45 and 4 Gigabit combo ports
- Managed Switch**, 19-inch rack mounted with 8 RJ45 and 4 Gigabit combo ports
- 16 fiber optic (LC duplex) ports
 - 16 fiber optic (SC duplex) ports
- Managed Switch**, 19-inch rack mounted with 4 Gigabit combo ports
- 24 fiber optic (SC duplex) ports, multimode
 - 24 fiber optic (SC duplex) ports, single mode

Power supply, modular redundant

- 48 V DC nominal
- 230 V nominal

Redundancy module

- 3 RJ45 ports
- 1 RJ45 port, 2 LC fiber optic ports (multimode)

SFP module

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 4824E-4GC ¹⁾	2891072	1

Accessories

FL SWITCH 4800E-P1	2891075	1
FL SWITCH 4800E-P5	2891076	1
FL RED 2003E PRP	2701863	1
FL RED 2001E PRP 2LC	2701864	1

See page 332

IEC 61850-3



8 RJ45 ports,
4 Gigabit combo (SFP or RJ45) ports
and 16 FO ports (multimode)



IEC 61850-3



8 RJ45 ports,
4 Gigabit combo (SFP or RJ45) ports
and 16 FO ports (single mode)



IEC 61850-3



4 Gigabit combo (SFP or RJ45) ports
and 24 FO ports



Technical data

8 (RJ45 ports)
10/100 Mbps

Ethernet (RJ45/FO combo)
Combo
Auto negotiation and autocrossing (RJ45 interface)

16 (multimode)
100 Mbps (full duplex)
LC
8 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)

Store and forward switch, Extended Ring and IEEE redundancy,
Multicast control, IGMP snooping, trunking, Port and Tagging VLANs,
Port and IEEE 802.1x security, SNMP V3 and Https security,
SNTP, web customization, user accounts

LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port

Network, linear, and star structure: any
100 m

From FL SWITCH 4800E-P...

442 mm / 44 mm / 375 mm
IP20
-40°C ... 70°C
5% ... 95% (non-condensing)
EN 61000-6-4
IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005
Class A product, see page 527

Technical data

8 (RJ45 ports)
10/100 Mbps

Ethernet (RJ45/FO combo)
Combo
Auto negotiation and autocrossing (RJ45 interface)

16 (single mode)
100 Mbps (full duplex)
LC
40 km (typical)

Store and forward switch, Extended Ring and IEEE redundancy,
Multicast control, IGMP snooping, trunking, Port and Tagging VLANs,
Port and IEEE 802.1x security, SNMP V3 and Https security,
SNTP, web customization, user accounts

LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port

Network, linear, and star structure: any
100 m

From FL SWITCH 4800E-P...

442 mm / 44 mm / 375 mm
IP20
-40°C ... 70°C
5% ... 95% (non-condensing)
EN 61000-6-4
IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005
Class A product, see page 527

Technical data

FL SWITCH 4800E-24FX-4GC FL SWITCH 4800E-24FX SM-4GC

-
-

Ethernet (RJ45/FO combo)
Combo
Auto negotiation and autocrossing (RJ45 interface)

24 (multimode) 24 (single mode)
100 Mbps (full duplex)
SC
8 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000) 40 km (typical)

Store and forward switch, Extended Ring and IEEE redundancy,
Multicast control, IGMP snooping, trunking, Port and Tagging VLANs,
Port and IEEE 802.1x security, SNMP V3 and Https security,
SNTP, web customization, user accounts

LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port

Network, linear, and star structure: any
100 m

From FL SWITCH 4800E-P...

442 mm / 44 mm / 375 mm
IP20
-40°C ... 70°C
5% ... 95% (non-condensing)
EN 61000-6-4
IEC 61850-3, IEEE 1613, EN 61000-6-2: 2005
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 4808E-16FX LC-4GC ¹⁾	2891073	1
FL SWITCH 4808E-16FX-4GC ¹⁾	2891079	1

Accessories

FL SWITCH 4800E-P1	2891075	1
FL SWITCH 4800E-P5	2891076	1
FL RED 2003E PRP	2701863	1
FL RED 2001E PRP 2LC	2701864	1

See page 332

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 4808E-16FX SM LC-4GC ¹⁾	2891074	1
FL SWITCH 4808E-16FX SM-4GC ¹⁾	2891080	1

Accessories

FL SWITCH 4800E-P1	2891075	1
FL SWITCH 4800E-P5	2891076	1
FL RED 2003E PRP	2701863	1
FL RED 2001E PRP 2LC	2701864	1

See page 332

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 4800E-24FX-4GC	2891102	1
FL SWITCH 4800E-24FX SM-4GC	2891104	1

Accessories

FL SWITCH 4800E-P1	2891075	1
FL SWITCH 4800E-P5	2891076	1
FL RED 2003E PRP	2701863	1
FL RED 2001E PRP 2LC	2701864	1

See page 332

SMCS series Managed Switches

Smart Managed Switches offer excellent real-time properties with high data throughput at the same time.

The industrial DIN rail switches support Fast Ethernet or Gigabit on all ports and are ideal for use in the PROFINET RT or EtherNet/IP™ environment.

The **FL SWITCH SMCS 8GT** and **6GT/2SFP** Gigabit versions also have maritime approvals GL, BV, ABS, LR, and DNV.

All eight-port versions of the SMCS switches can be used in Ex zone 2.



8 RJ45 ports



All devices support:

- RSTP
- MRP (client and master)
- VLANs
- SNMP

Ethernet interface
Number of ports
Transmission speed
Fiber optic interface
Number of ports
Transmission speed
Wavelength
Transmission distance

Other connections
Serial (RS-232)
Function
Basic functions

Status and diagnostic indicators

Power supply
Supply voltage
Residual ripple
Supply voltage range
Typical current consumption
General data
Dimensions
Degree of protection
Ambient temperature (operation)
Permissible humidity (operation)
Noise emission
Noise immunity

Technical data

FL SWITCH SMCS 8TX	FL SWITCH SMCS 8GT
8 (RJ45 ports)	
10/100 Mbps	10/100/1000 Mbps
-	-
-	-
-	-
-	-

RS-232-C, 6-pos. MINI-DIN socket (PS/2)
Store-and-forward switch complies with IEEE 802.3, 4 priority classes in acc. with IEEE 802.1 P TCP/IP protocol, BootP-capable, port-mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), PROFINET Device, Media Redundancy Protocol (MRP).
LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex)

24 V DC (redundant)
3.6 V _{pp}
18 V DC ... 32 V DC
240 mA (at U _s = 24 V DC) 450 mA (at U _s = 24 V DC)
128 mm / 110 mm / 69 mm
IP20
0°C ... 55°C (non-condensing)
5% ... 95% (non-condensing)
EN 61000-6-3 +A11
EN 61000-6-2:2005

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SMCS 8TX	2989226	1
FL SWITCH SMCS 8TX-PN	2989103	1
FL SWITCH SMCS 8GT	2891123	1

Accessories

FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1

Description
Smart Managed Compact Switch
- 8 RJ45 ports
- 8 RJ45 ports, preconfigured for PROFINET
- 8 RJ45 ports, 1000 Mbps
- 6 RJ45 ports, 2 SFP FO ports
- 6 RJ45 ports, 2 SFP FO ports, 1000 Mbps
- 16 RJ45 ports
- 14 RJ45 ports, 2 SC FO ports (multimode)
- 14 RJ45 ports, 2 SC FO ports (single mode)

Configuration memory, replaceable
Configuration memory, replaceable, with MRM function

SFP module

PROFI[®]
NET

6 RJ45 ports and 2 SFP ports

PROFI[®]
NET

16 RJ45 ports

PROFI[®]
NET

14 RJ45 ports and 2 FO ports



Technical data

FL SWITCH SMCS 6TX/2SFP FL SWITCH SMCS 6GT/2SFP

6 (RJ45 ports)
10/100 Mbps 10/100/1000 Mbps2 (SFP ports)
1000 Mbps (full duplex)
-
up to 80 km (depending on the fiber/SFP module used)
-

RS-232-C, 6-pos. MINI-DIN socket (PS/2)

Store-and-forward switch complies with IEEE 802.3,
4 priority classes in acc. with IEEE 802.1 P TCP/IP protocol,
BootP-capable, port-mirroring, integrated web server function,
multicast filtering, IGMP snooping, VLAN,
Rapid Spanning Tree (RSTP), PROFINET Device,
Media Redundancy Protocol (MRP).
LEDs: US1, US2 (power supply), Fail (alarm contact),
2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex)24 V DC (redundant)
3.6 V_{PP}
18 V DC ... 32 V DC
600 mA (at U_S = 24 V DC)128 mm / 110 mm / 69 mm
IP20
0°C ... 55°C (non-condensing)
5% ... 95% (non-condensing)
EN 61000-6-3 +A11
EN 61000-6-2:2005

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SMCS 6TX/2SFP	2989323	1
FL SWITCH SMCS 6GT/2SFP	2891479	1

Accessories

FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1

See page 332



Technical data

16 (RJ45 ports)
10/100 Mbps-
-
-
-
-

RS-232-C, 6-pos. MINI-DIN socket (PS/2)

Store-and-forward switch complies with IEEE 802.3,
4 priority classes in acc. with IEEE 802.1 P TCP/IP protocol,
BootP-capable, port-mirroring, integrated web server function,
multicast filtering, IGMP snooping, VLAN,
Rapid Spanning Tree (RSTP), PROFINET Device,
Media Redundancy Protocol (MRP).
LEDs: US1, US2 (power supply), Fail (alarm contact),
2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex)24 V DC (redundant)
3.6 V_{PP}
18 V DC ... 32 V DC
200 mA (at U_S = 24 V DC)214 mm / 110 mm / 69 mm
IP20
-40°C ... 70°C (non-condensing)
5% ... 95% (non-condensing)
EN 61000-6-3
EN 61000-6-2:2005

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SMCS 16TX	2700996	1

Accessories

FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1



Technical data

FL SWITCH SMCS 14TX/2FX FL SWITCH SMCS 14TX/2FX-SM

14 (RJ45 ports)
10/100 Mbps2 (SC multimode) 2 (SC single mode)
100 Mbps (full duplex)
1310 nm
10000 m (depending on the fiber used) 36000 m (fiberglass with F-G 9/125 0.36 dB/km)
6400 m (fiberglass with F-G 50/125 0.7 dB/km F1200) 32000 m (fiberglass with F-G 9/125 0.4 dB/km)

RS-232-C, 6-pos. MINI-DIN socket (PS/2)

Store-and-forward switch complies with IEEE 802.3,
4 priority classes in acc. with IEEE 802.1 P TCP/IP protocol,
BootP-capable, port-mirroring, integrated web server function,
multicast filtering, IGMP snooping, VLAN,
Rapid Spanning Tree (RSTP), PROFINET Device,
Media Redundancy Protocol (MRP).
LEDs: US1, US2 (power supply), Fail (alarm contact),
2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex)24 V DC (redundant)
3.6 V_{PP}
18 V DC ... 32 V DC
290 mA (at U_S = 24 V DC)214 mm / 110 mm / 69 mm
IP20
-40°C ... 70°C (non-condensing)
5% ... 95% (non-condensing)
EN 61000-6-3
EN 61000-6-2:2005

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH SMCS 14TX/2FX	2700997	1
FL SWITCH SMCS 14TX/2FX-SM	2701466	1

Accessories

FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1

Switches for PROFINET IRT

The IRT switches are particularly suitable for high-performance PROFINET networks.

The **FL SWITCH IRT** switches use built-in ERTEC (Enhanced Real Time Ethernet Controller) technology to forward PROFINET data packets as fast as possible using the cut-through method.

In addition, PROFINET data packets are always delivered with the highest priority to the receiver independently of other data traffic.

The **FL SWITCH IRT** switches can be fully configured and monitored via STEP7 and PC Worx.

Features:

- Easy integration into a PROFINET network
- Extended temperature range (-25°C ... +60°C)
- POF interfaces for use in areas subject to high levels of EMI
- Path length measurement
- Fiber optic diagnostics
- MRP client



4 RJ45 ports



Ethernet interface
Number of ports
Transmission speed
Fiber optic interface
Number of ports
Transmission speed
Wavelength
Transmission distance
Function
Basic functions

Status and diagnostic indicators

Power supply
Supply voltage
Residual ripple
Supply voltage range
Typical current consumption
General data
Dimensions
Degree of protection
Ambient temperature (operation)
Permissible humidity (operation)
EMC note

Technical data

4 (RJ45 ports)
10/100 Mbps
-
-
-
-
Cut-through/store-and-forward switch complies with IEEE 802.3, 2 priority classes in accordance with IEEE802.1 P, TCP/IP protocol, DCP capable, integrated web server function, PROFINET device.
LEDs: US1, US2 (power supply), Fail (alarm contact), 3 LEDs per Ethernet port (Link, Activity, and FO status), and BF (Bus Fail)

Description
Ethernet switch for PROFINET applications
- 4 RJ45 ports
- 2 RJ45 ports, 2 POF SC-RJ ports
- 1 RJ45 port, 3 POF SC-RJ ports

Configuration memory, replaceable
Configuration memory, replaceable, with MRM function

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH IRT 4TX	2700689	1

Accessories

FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1



2 RJ45 ports and 2 POF SC-RJ ports



1 RJ45 port and 3 POF SC-RJ ports

1 RJ45 port and 3 POF SC-RJ ports,
for wall mounting

Technical data

2 (RJ45 ports)
10/100 Mbps

2 (SC-RJ)
100 Mbps (full duplex)
650 nm
up to 100 m (depending on the fiber used)

Cut-through/store-and-forward switch complies with IEEE 802.3,
2 priority classes in accordance with IEEE802.1 P, TCP/IP protocol,
DCP capable, integrated web server function, PROFINET device.

LEDs: US1, US2 (power supply), Fail (alarm contact),
3 LEDs per Ethernet port (Link, Activity, and FO status),
and BF (Bus Fail)

24 V DC (redundant)
3.6 V_{PP}
18.5 V DC ... 30.2 V DC
235 mA (at U_S = 24 V DC)

127 mm / 95 mm / 69 mm
IP20
-25°C ... 60°C
5% ... 95% (non-condensing)
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH IRT 2TX 2POF	2700691	1

Accessories

FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1



Technical data

1 (RJ45 port)
10/100 Mbps

3 (SC-RJ)
100 Mbps (full duplex)
650 nm
up to 100 m (depending on the fiber used)

Cut-through/store-and-forward switch complies with IEEE 802.3,
2 priority classes in accordance with IEEE802.1 P, TCP/IP protocol,
DCP capable, integrated web server function, PROFINET device.

LEDs: US1, US2 (power supply), Fail (alarm contact),
3 LEDs per Ethernet port (Link, Activity, and FO status),
and BF (Bus Fail)

24 V DC (redundant)
3.6 V_{PP}
18.5 V DC ... 30.2 V DC
270 mA (at U_S = 24 V DC)

127 mm / 95 mm / 69 mm
IP20
-25°C ... 60°C
5% ... 95% (non-condensing)
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH IRT TX 3POF	2700692	1

Accessories

FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1



Technical data

1 (RJ45 port)
10/100 Mbps

3 (SC-RJ)
100 Mbps (full duplex)
650 nm
up to 100 m (depending on the fiber used)

Cut-through/store-and-forward switch complies with IEEE 802.3,
2 priority classes in accordance with IEEE802.1 P, TCP/IP protocol,
DCP capable, integrated web server function, PROFINET device.

LEDs: US1, US2 (power supply), Fail (alarm contact),
3 LEDs per Ethernet port (Link, Activity, and FO status),
and BF (Bus Fail)

24 V DC (redundant)
3.6 V_{PP}
18.5 V DC ... 30.2 V DC
260 mA (at U_S = 24 V DC)

176 mm / 112 mm / 99 mm
IP67
-25°C ... 60°C
5% ... 95% (non-condensing)
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH IRT IP TX/3POF	2700697	1

Accessories

FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1

7000 series Managed Switches

The automation switches in the 7000 series are switches that support direct integration into a Device Level Ring (DLR). Direct integration of the switches into the DLR is a considerable advantage when installing and operating EtherNet/IP™ networks.

Up to six devices can be integrated into a DLR via the **FL SWITCH 7000**. In system networks, the switches allow the redundant rings to be connected to the higher-level networking level. In this way, you can create networks with minimal switch-over times of less than three milliseconds (< 3 ms).

The Managed Switches from the 7000 series communicate directly via the Common Industrial Protocol (CIP) in the EtherNet/IP™ network. Via CIP, you can integrate the switch into an EtherNet/IP™ control system from where it can be configured and diagnosed.

Pure copper versions and versions with up to four fiberglass ports are available for flexible use. The range also includes versions for Gigabit transmission and combo ports for free selection of the transmission medium (RJ45 or SFP).

Features:

- Slim design
- Extended temperature range (-40°C ... +70°C)
- VLANs
- Common Industrial Protocol (CIP)
- Device Level Ring (DLR)
- RSTP
- Web-based management
- Port-based/pool-based DHCP server, DHCP option 82
- HTTPS/SNMPv3

EtherNet/IP



8 RJ45 ports

Ex:

Technical data

Ethernet interface	
Number of ports	8 (RJ45 ports)
Transmission speed	10/100 Mbps
Fiber optic interface	
Number of ports	-
Transmission speed	-
Wavelength	-
Transmission distance	-
Fiber optic interface	
Number of ports	-
Transmission speed	-
Wavelength	-
Transmission distance	-
Function	
Basic functions	Store-and-forward switch, complies with IEEE 802.3
Management	Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Remanente Event-Table RMON History N:1-Portmirroring LLDP (Link Layer Discovery Protocol) SNMP-Traps ACD (Address Conflict Detection) DLR (Device Level Ring) RSTP (Rapid Spanning Tree Protocol) FRD (Fast Ring Detection) Large Tree Support MAC-based Port Security
Diagnostic function	LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex) EtherNet/IP™ status LED: Net, Mod
Redundancy	
Additional function	
Status and diagnostic indicators	
Power supply	
Supply voltage	24 V DC (redundant)
Residual ripple	3.6 V _{pp}
Supply voltage range	12 V DC ... 58 V DC
Typical current consumption	350 mA (at U _S = 24 V DC)
General data	
Dimensions	60 mm / 130 mm / 135.5 mm
Degree of protection	IP20
Ambient temperature (operation)	-40°C ... 70°C
Permissible humidity (operation)	10% ... 95% (non-condensing)
Noise emission	EN 61000-6-4
Noise immunity	EN 61000-6-2:2005
EMC note	Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 7008-EIP	2701418	1

Accessories

SFP module	
-------------------	--

EtherNet/IP™



**6 / 5 RJ45 ports and
2 / 3 fiber optic ports**

EtherNet/IP™



**6 / 4 RJ45 ports and
2 / 4 Gigabit combo ports (SFP or RJ45)**

EtherNet/IP™



**4 RJ45 ports, 2 Fast Ethernet and
2 Gigabit combo ports (SFP or RJ45)**



Technical data

FL SWITCH 7006/2FX-EIP FL SWITCH 7005/FX-2FXSM-EIP

6 (RJ45 ports) 5 (RJ45 ports)
10/100 Mbps
2 (SC multimode) 1 (SC multimode)
100 Mbps (full duplex)
1300 nm
11000 m (fiberglass with F-G 62.5/125 0.7 dB/km F1000)

- 2 (SC single mode)
- 100 Mbps (full duplex)
- 1300 nm
- 36000 m (fiberglass with F-G 9/125 0.36 dB/km)

Store-and-forward switch, complies with IEEE 802.3

Web-based management (HTTP/HTTPS)

SNMPv1/v2/v3

Remanente Event-Table

RMON History

N:1-Portmirroring

LLDP (Link Layer Discovery Protocol)

SNMP-Traps

ACD (Address Conflict Detection)

DLR (Device Level Ring)

RSTP (Rapid Spanning Tree Protocol)

FRD (Fast Ring Detection)

Large Tree Support

MAC-based Port Security

LEDs: US1, US2 (power supply), Fail (alarm contact),

2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex)
EtherNet/IP™ status LED: Net, Mod

24 V DC (redundant)
3.6 V_{PP}
12 V DC ... 58 V DC
470 mA (at U_S = 24 V DC) 520 mA (at U_S = 24 V DC)

60 mm / 130 mm / 135.5 mm
IP20
-40°C ... 70°C
10% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2:2005
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 7006/2FX-EIP	2701419	1
FL SWITCH 7005/FX-2FXSM-EIP	2701420	1

Accessories

Technical data

FL SWITCH 7006-2GC-EIP FL SWITCH 7004-4GC-EIP

6 (RJ45 ports) 4 (RJ45 ports)
10/100 Mbps
2 (Combo ports) 4 (Combo ports)
10/100/1000 Mbps (full duplex)
-
up to 80 km (depending on the fiber/SFP module used)

-

-

-

-

Store-and-forward switch, complies with IEEE 802.3

Web-based management (HTTP/HTTPS)

SNMPv1/v2/v3

Remanente Event-Table

RMON History

N:1-Portmirroring

LLDP (Link Layer Discovery Protocol)

SNMP-Traps

ACD (Address Conflict Detection)

DLR (Device Level Ring)

RSTP (Rapid Spanning Tree Protocol)

FRD (Fast Ring Detection)

Large Tree Support

MAC-based Port Security

LEDs: US1, US2 (power supply), Fail (alarm contact),

2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex)
EtherNet/IP™ status LED: Net, Mod

24 V DC (redundant)
3.6 V_{PP}
12 V DC ... 58 V DC
520 mA (at U_S = 24 V DC) 535 mA (at U_S = 24 V DC)

60 mm / 130 mm / 135.5 mm
IP20
-40°C ... 70°C
10% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2:2005
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 7006-2GC-EIP	2701554	1
FL SWITCH 7004-4GC-EIP	2701553	1

Accessories

See page 332

Technical data

4 (RJ45 ports)
10/100 Mbps
2 (Combo ports)
10/100/1000 Mbps (full duplex)
-
up to 80 km (depending on the fiber/SFP module used)

2 (Combo ports)
10/100 Mbps (full duplex)

-

up to 40 km (depending on the fiber/SFP module used)

Store-and-forward switch, complies with IEEE 802.3

Web-based management (HTTP/HTTPS)

SNMPv1/v2/v3

Remanente Event-Table

RMON History

N:1-Portmirroring

LLDP (Link Layer Discovery Protocol)

SNMP-Traps

ACD (Address Conflict Detection)

DLR (Device Level Ring)

RSTP (Rapid Spanning Tree Protocol)

FRD (Fast Ring Detection)

Large Tree Support

MAC-based Port Security

LEDs: US1, US2 (power supply), Fail (alarm contact),

2 LEDs per Ethernet port (Link and switchable Activity/Speed/Duplex)
EtherNet/IP™ status LED: Net, Mod

24 V DC (redundant)
3.6 V_{PP}
12 V DC ... 58 V DC
560 mA (at U_S = 24 V DC)

60 mm / 130 mm / 135.5 mm
IP20
-40°C ... 70°C
10% ... 95% (non-condensing)
EN 61000-6-4
EN 61000-6-2:2005
Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL SWITCH 7004-2TC-2GC-EIP	2702175	1

Accessories

See page 332

2000 series NAT switches

Thanks to its high flexibility, the 2000 series NAT switch provides a solution for every NAT application. Individual ports can be mapped to up to eight different LAN or WAN interfaces in total. This enables a wide range of different solutions for individual applications. Redundant connections to higher-level networks, such as ring topologies on the LAN side, can also be implemented easily.



8 RJ45 ports

new



4 / 8 RJ45 ports, optional 2 SFP ports and 2 Gigabit combo ports

new



Technical data

Ethernet interface	
Number of ports	8 (RJ45 ports)
Transmission speed	10/100 Mbps
Fiber optic interface	
Number of ports	-
Transmission speed	-
Transmission distance	-
Function	
Basic functions	Router for standard routing, NAT, 1:1-NAT and port forwarding
Management	Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Command-line interface (Telnet, SSH) RMON History LLDP (Link Layer Discovery Protocol) SNMP-Traps N:1-Portmirroring ACD (Address Conflict Detection) MRP (Media Redundancy Protocol) RSTP (Rapid Spanning Tree Protocol)
Diagnostic function	
Redundancy	
NAT functions	1:1-NAT Virtual-NAT IP-Masquerading Port forwarding
Status and diagnostic indicators	LEDs: US (power supply), 2 LEDs per Ethernet port (Link/Activity and Speed)

Technical data

FL NAT 2208	FL NAT 2304-2GC-2SFP
8 (RJ45 ports)	4 (RJ45 ports)
10/100 Mbps	10/100/1000 Mbps
-	2 (SFP ports)
-	100/1000 Mbps (full duplex)
-	up to 80 km (depending on the fiber/SFP module used)
Function	
Basic functions	Store-and-forward switch, complies with IEEE 802.3
Management	Web-based management (HTTP/HTTPS) SNMPv1/v2/v3 Command-line interface (Telnet, SSH) RMON History LLDP (Link Layer Discovery Protocol) SNMP-Traps N:1-Portmirroring ACD (Address Conflict Detection) MRP (Media Redundancy Protocol) RSTP (Rapid Spanning Tree Protocol) FRD (Fast Ring Detection) Large Tree Support
Diagnostic function	
Redundancy	
NAT functions	1:1-NAT Virtual-NAT IP-Masquerading Port forwarding
Status and diagnostic indicators	LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (Link/Activity and Speed)

Power supply	
Supply voltage	24 V DC (single)
Residual ripple	3.6 V _{pp}
Supply voltage range	18 V DC ... 32 V DC
Typical current consumption	180 mA (at U _S = 24 V DC)
General data	
Dimensions	W / H / D 45 mm / 130 mm / 115 mm
Degree of protection	IP20
Ambient temperature (operation)	0°C ... 60°C
Permissible humidity (operation)	10% ... 95% (non-condensing)
Noise emission	EN 61000-6-4
Noise immunity	EN 61000-6-2
EMC note	Class A product, see page 527

Power supply	
Supply voltage	24 V DC (redundant)
Residual ripple	3.6 V _{pp}
Supply voltage range	9 V DC ... 57 V DC
Typical current consumption	185 mA (at U _S = 24 V DC)
General data	
Dimensions	W / H / D 45 mm / 130 mm / 115 mm
Degree of protection	IP20
Ambient temperature (operation)	-40°C ... 70°C
Permissible humidity (operation)	10% ... 95% (non-condensing)
Noise emission	EN 61000-6-4
Noise immunity	EN 61000-6-2
EMC note	Class A product, see page 527

Ordering data

Description	Type	Order No.	Pcs./Pkt.
NAT switch - 8 RJ45 ports - 4 RJ45 ports, 2 Gigabit combo ports (SFP or RJ45), and 2 SFP ports	FL NAT 2008	2702881	1

Ordering data

Description	Type	Order No.	Pcs./Pkt.
FL NAT 2208 FL NAT 2304-2GC-2SFP		2702882 2702981	1 1

Accessories

SFP module	
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Accessories

See page 332

Layer 3 switches

Gigabit Modular Switches

The high-performance switch can communicate on up to 28 ports via any transmission medium.

Features:

- Up to 12 integrated Gigabit ports
- Quick and easy local configuration options with the operator/display interface
- Optional Layer 3 functions can be activated
- Static and dynamic routing
- Port- and VLAN-based routing



Head station, 8 - 16 ports



Head station, 12 - 20 ports



Technical data

SFP interface	
Number of ports	4 (SFP ports or RJ45 ports)
Transmission speed	1000 Mbps (full duplex)
Copper interface	
Number of ports	4 (RJ45 ports)
Transmission speed	10/100 Mbps
Interface extension	
Number of ports	2 (per interface module)
Note on the connection method	Max. 4 interface modules (without extension)
Transmission speed	10/100 Mbps (full duplex)
Transmission physics	Multimode fiberglass Single mode fiberglass POF-SCRJ GI-HCS fibers Copper PoE
Function	
Basic functions	Store-and-forward switch complies with IEEE 802.3, 8 priority classes in accordance with IEEE 802.1p, smart mode, port mirroring, multicast filtering, IGMP snooping, VLANs, Media Redundancy Protocol (MRP in accordance with IEC 62439), Rapid Spanning Tree (RSTP), Fast Ring Detection (FRD), Large Tree Support, IEEE 802.1X security, port security, SNMPv3, HTTPS, PROFINET device, GMRP, GVRP, SNTp, 2 digital inputs
Power supply	
Supply voltage	24 V DC (redundant)
Supply voltage range	18.5 V DC ... 30.2 V DC
Typical current consumption	800 mA (up to 2.5 A, depends on the configuration)
General data	
Dimensions	W / H / D 287 mm / 122 mm / 113 mm
Degree of protection	IP20
Ambient temperature (operation)	-20°C ... 55°C (non-condensing)
Noise emission	EN 61000-6-3/-4
Noise immunity	EN 61000-6-2:2005

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Gigabit Modular Switch			
- 4 Gigabit ports and 12 Fast Ethernet ports	FL SWITCH GHS 4G/12	2700271	1
- 12 Gigabit ports and 8 Fast Ethernet ports	FL SWITCH GHS 4G/12-L3	2700786	1

Accessories

Extension	FL FXT	2989307	1
- 8 Ethernet ports	SD FLASH 512MB	2988146	1
Program and configuration memory, plug-in			
Parameterization memory, replaceable, with MRM function	FL SD FLASH/MRM	2700270	1
Parameterization memory, replaceable with MRM and Layer 3 function	FL SD FLASH/L3/MRM	2700607	1

SFP module

See page 332



Technical data

SFP interface	
Number of ports	4 (SFP ports)
Transmission speed	1000 Mbps (full duplex)
Copper interface	
Number of ports	8 (RJ45 ports)
Transmission speed	10/100/1000 Mbps
Interface extension	
Number of ports	2 (per interface module)
Note on the connection method	Max. 4 interface modules (without extension)
Transmission speed	10/100 Mbps (full duplex)
Transmission physics	Multimode fiberglass Single mode fiberglass POF-SCRJ GI-HCS fibers Copper PoE
Function	
Basic functions	Store-and-forward switch complies with IEEE 802.3, 8 priority classes in accordance with IEEE 802.1p, smart mode, port mirroring, multicast filtering, IGMP snooping, VLANs, Media Redundancy Protocol (MRP in accordance with IEC 62439), Rapid Spanning Tree (RSTP), Fast Ring Detection (FRD), Large Tree Support, IEEE 802.1X security, port security, SNMPv3, HTTPS, PROFINET device, GMRP, GVRP, SNTp, 2 digital inputs
Power supply	
Supply voltage	24 V DC (redundant)
Supply voltage range	18.5 V DC ... 30.2 V DC
Typical current consumption	800 mA (up to 2.7 A, depends on the configuration)
General data	
Dimensions	287 mm / 122 mm / 113 mm
Degree of protection	IP20
Ambient temperature (operation)	-20°C ... 55°C (non-condensing)
Noise emission	EN 61000-6-3/-4
Noise immunity	EN 61000-6-2:2005

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Gigabit Modular Switch			
- 4 Gigabit ports and 12 Fast Ethernet ports	FL SWITCH GHS 4G/12	2700271	1
- 12 Gigabit ports and 8 Fast Ethernet ports	FL SWITCH GHS 4G/12-L3	2700786	1

Accessories

Extension	FL FXT	2989307	1
- 8 Ethernet ports	SD FLASH 512MB	2988146	1
Program and configuration memory, plug-in			
Parameterization memory, replaceable, with MRM function	FL SD FLASH/MRM	2700270	1
Parameterization memory, replaceable with MRM and Layer 3 function	FL SD FLASH/L3/MRM	2700607	1

See page 332



**Fiber optic ports
(single mode)**



POF SC-RJ ports



Configuration memory and MRP manager function



Technical data	
2	100 Mbps
2	100 Mbps 1300 nm 36000 m (fiberglass with F-G 9/125 0.36 dB/km)
	32000 m (fiberglass with F-G 9/125 0.4 dB/km)
	26000 m (fiberglass with F-G 9/125 0.5 dB/km)
-	
Media module for Modular Managed Switch	
From FL SWITCH GHS or FXT via head station 200 mA	
31 mm / 85 mm / 72.5 mm IP20 0°C ... 55°C (non-condensing) 10% ... 95% (non-condensing) EN 61000-6-3/-4 EN 61000-6-2:2005 Class A product, see page 527	



Technical data	
-	
-	
2 (SC-RJ)	
100 Mbps	
-	
50 m (including 3 dB system reserve, polymer fiber with F-K 980/1000 230 dB/km)	
100 m (PCF fiber with F-S 200/230 10 dB/km)	
-	
-	
Media module for Modular Managed Switch with FO diagnostics	
From FL SWITCH GHS or FXT	
48 V DC (via head station)	
200 mA	
31 mm / 73.5 mm / 72.5 mm	
IP20	
0°C ... 55°C (non-condensing)	
10% ... 95% (non-condensing)	
EN 61000-6-3/-4	
EN 61000-6-2:2005	
Class A product, see page 527	

Technical data	
FL MEM PLUG	FL MEM PLUG/MRM
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
Configuration memory (plug-in)	Configuration memory and manager for the media redundancy protocol (MRP)
from FL SWITCH MCS/SMCS	
-	
-	
16 mm / 49 mm / - IP20 0°C ... 55°C (non-condensing) 10% ... 95% (non-condensing) EN 61000-6-3/-4 EN 61000-6-2:2005	

Ordering data		
Type	Order No.	Pcs./Pkt.
FL IF 2FX SM SC-D	2832205	1

Ordering data		
Type	Order No.	Pcs./Pkt.
FL IF 2POF SCRJ-D	2891084	1

Ordering data		
Type	Order No.	Pcs./Pkt
FL MEM PLUG	2891259	1
FL MEM PLUG/MRM	2891275	1



**Fiberglass,
for Gigabit transmission ranges up to 80 km**



**WDM technology,
for transmission via a single glass fiber**



**Gigabit transmission
with copper connection**



Technical data	
FL SFP LX	FL SFP LH
-	-
-	-
1 (LC single mode)	1 Gbps
1310 nm	1550 nm
30 km (Fiberglass 9/125)	80 km (Fiberglass 9/125)
250 m (Fiberglass 62.5/125)	-
-	-
-	-
SFP module as FO port	
via SFP slot	
3.3 V (via Factoryline switch)	
-40°C ... 85°C (non-condensing)	
30% ... 95% (non-condensing)	

Technical data	
FL SFP FE WDM20-SET	FL SFP WDM10-SET
-	-
-	-
1 (LC single mode)	1 Gbps
100 Mbps	1 Gbps
1310 nm / 1550 nm (TX)	
20 km (Fiberglass 9/125)	10 km (Fiberglass 9/125)
-	-
-	-
-	-
SFP module as FO port	
via SFP slot	
3.3 V (via Factoryline switch)	
-40°C ... 75°C	
-	

Technical data
1 (RJ45 port)
1 Gbps
-
-
-
-
-
-
SFP module as copper port
via SFP slot
3.3 V (via Factoryline switch)
-40°C ... 85°C (non-condensing)
-

Ordering data		
Type	Order No.	Pcs./Pkt.
FL SFP LX10-B	1025401	1
FL SFP LX	2891767	1
FL SFP LH	2989912	1

Ordering data		
Type	Order No.	Pcs./Pkt.
FL SFP FE WDM20-SET	2702439	1
FL SFP FE WDM20-A	2702437	1
FL SFP FE WDM20-B	2702438	1
FL SFP WDM10-SET	2702442	1
FL SFP WDM10-A	2702440	1
FL SFP WDM10-B	2702441	1

Ordering data		
Type	Order No.	Pcs./Pkt.
FL SFP GT	2989420	1

Security routers for DIN rails

The compact and fanless DIN rail devices in metal housing suitable for industrial applications have an SD card slot at the front for configuration memory. The SD cards can be used for starting up or replacing the devices quickly and easily.

The devices feature an extended temperature range and contain a buffered real-time clock and trusted platform module (TPM) for secure and reliable key generation and management.

The **FL MGUARD RS4000** devices provide high-availability high-end security for industry and create a remote maintenance infrastructure for the secure connection of machines and systems.

The **FL MGUARD RS2000** devices are designed for price-sensitive applications with fewer complex requirements and allow secure remote maintenance of machines and systems in the field via the Internet. In this context, they are used as industrial remote service routers with a simplified configuration.

Secure networks also with Gigabit

The new router generation for top-class security:

- Replaceable configuration memory
- Comprehensive connection options
- Flexible routing
- Intelligent stateful inspection firewall
- Secure remote services (VPN) in accordance with IPsec standard or as OpenVPN client
- Central management tool available

VPN licenses

Operation with up to 250 parallel VPN tunnels is possible with optional VPN licenses.

Notes:

Central device management software, the Device Manager for FL MGUARD devices, can be found on page 342



Router for standard routing



Technical data

Ethernet interface	
Number of ports	2 (RJ45 ports)
Transmission speed	10/100 Mbps
Function	
Basic functions	Router for standard routing, NAT, 1:1-NAT and port forwarding
SNMP – Simple Network Management Protocol	SNMPv1, v2, v3
Security functions	
VPN throughput	-
Number of VPN tunnels	-
Encryption methods	-
Internet Protocol Security (IPsec) mode	-
Authentication	-
Data integrity	MD5, SHA-1, SHA 256, SHA-512
Firewall data throughput	-
Firewall rules	-
Filtering	-
Protection against	IP spoofing
Routing	Standard routing, NAT, 1:1-NAT, port forwarding
Power supply	
Supply voltage	24 V DC
Typical current consumption	100 mA (at U _S = 24 V DC)
General data	
Dimensions	45 mm / 130 mm / 114 mm
Ambient temperature (operation)	-20°C ... 60°C
EMC note	Class A product, see page 527

Description

Router/firewall

- Without VPN
- With VPN

Program and configuration memory, plug-in

License for lifetime software update of FL MGUARD field devices

License for activating CIFS Integrity Monitoring (CIM) on FL MGUARD

License for activating the OPC inspector function on an FL MGUARD

License for activating the firewall/router redundancy function on an FL MGUARD device pair

License for activating the firewall/router and VPN redundancy function on an FL MGUARD device pair

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGUARD RS2000 TX/TX-B	2702139	1

Accessories

SD FLASH 512MB	2988146	1
FL MGUARD LIC LIFETIME FW	2700184	1



Router with simplified 2-click firewall and VPN



Router with intelligent firewall and VPN



Gigabit router with firewall, replaceable memory



Technical data	
2 (RJ45 ports)	
10/100 Mbps	
Router with firewall and VPN for 2 tunnels (fixed), metal housing, slot for any SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps / 40 Mbps	
SNMPv1, v2, v3	
max. 40 Mbps (Router mode, VPN bidirectional throughput)	
2 (fixed, IPsec (IETF standard))	
DES, 3DES, AES-128, -192, -256	
ESP tunnel / ESP transport	
X.509v3 certificates with RSA or PSK	
MD5, SHA-1, SHA 256, SHA-512	
max. 124 Mbps (Router mode, default firewall rules, bidirectional throughput)	
Simple stateful inspection firewall, no user firewall, no conditional firewall, no rule sets	
Incoming or outgoing traffic	
-	
Standard routing, NAT, 1:1-NAT, port forwarding	
24 V DC	
100 mA (at U _s = 24 V DC)	
45 mm / 130 mm / 114 mm	
-20°C ... 60°C	
Class A product, see page 527	

Technical data	
FL MGUARD RS4000 TX/TX	FL MGUARD RS4000 TX/TX VPN
2 (RJ45 ports)	
10/100 Mbps	
Router with intelligent firewall (VPN, 10 tunnels as an option, up to 250 with additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN (as an option): up to 124 Mbps/40 Mbps (as an option)	Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps/40 Mbps
SNMPv1, v2, v3	
max. 40 Mbps (Router mode, VPN bidirectional throughput)	
0 (up to 250 tunnels with additional license as an option)	10 (up to 250 tunnels with additional license as an option)
DES, 3DES, AES-128, -192, -256	
ESP tunnel / ESP transport	
X.509v3 certificates with RSA or PSK	
MD5, SHA-1, SHA 256, SHA-512	
max. 124 Mbps (Router mode, default firewall rules, bidirectional throughput)	
Configurable stateful inspection firewall with full scope of functions	
MAC and IP addresses, ports, protocols	
IP spoofing, DoS and Syn Flood Protection	
Standard routing, NAT, 1:1-NAT, port forwarding	
24 V DC (redundant)	
100 mA (at U _S = 24 V DC)	
45 mm / 130 mm / 114 mm	
-20°C ... 60°C	
Class A product, see page 527	

Technical data	
FL MGuard GT/GT	FL MGuard GT/GT VPN
2 (Combo ports)	
10/100/1000 Mbps (SFP module: 100/1000 Mbps)	
Router with intelligent firewall and Gigabit connectivity	Router with intelligent firewall and Gigabit connectivity and VPN
SNMPv1, v2, v3	
max. 106 Mbps (Router mode, VPN bidirectional throughput)	
0 (up to 250 tunnels with additional license as an option)	10 (up to 250 tunnels with additional license as an option)
DES, 3DES, AES-128, -192, -256	
-	ESP tunnel / ESP transport
-	X.509v3 certificates with RSA or PSK
MD5, SHA-1, SHA 256, SHA-512	
max. 417 Mbps (Router mode, default firewall rules, bidirectional throughput)	
Configurable stateful inspection firewall	
MAC and IP addresses, ports, protocols	
IP spoofing, DoS and Syn Flood Protection	
Standard routing, NAT, 1:1-NAT, port forwarding	
24 V DC (redundant)	
270 mA (at U _s = 24 V DC)	
128 mm / 110 mm / 69 mm	
-20°C ... 60°C	
Class A product, see page 527	

Ordering data		
Type	Order No.	Pcs./Pkt.
FL MGuard RS2000 TX/TX VPN	2700642	1
Accessories		
SD FLASH 512MB	2988146	1
FL MGuard LIC LIFETIME FW	2700184	1

Ordering data		
Type	Order No.	Pcs./Pkt.
FL MGuard RS4000 TX/TX	2700634	1
FL MGuard RS4000 TX/TX VPN	2200515	1
Accessories		
SD FLASH 512MB	2988146	1
FL MGuard LIC LIFETIME FW	2700184	1
FL MGuard LIC CIM	2701083	1
FL MGuard LIC OPC INSP	2702191	1
FL MGuard LIC FW RD	2701356	1
FL MGuard LIC FW/VPN RD	2702193	1

Ordering data		
Type	Order No.	Pcs./Pkt.
FL MGuard GT/GT	2700197	1
FL MGuard GT/GT VPN	2700198	1
Accessories		
FL MEM PLUG	2891259	1
FL MGuard LIC LIFETIME FW	2700184	1
FL MGuard LIC CIM	2701083	1
FL MGuard LIC OPC INSP	2702191	1
FL MGuard LIC FW RD	2701356	1
FL MGuard LIC FW/VPN RD	2702193	1

Security routers for DIN rails

The compact, fanless security routers with 5 unmanaged ports or 4 managed ports and DMZ port for mutual protection of several networks are equipped with the simplified 2-click firewall or intelligent firewall with full functionality and easy configuration.

The devices have an SD card slot at the front for configuration memory. The SD cards can be used for starting up or replacing the devices quickly and easily.

The devices feature an extended temperature range and contain a buffered real-time clock and trusted platform module (TPM) for secure and reliable key generation and management.

VPN licenses

Operation with up to 250 parallel VPN tunnels is possible with optional VPN licenses.

Notes:

Central device management software, the Device Manager for FL MGUARD devices, can be found on page 342



Router with simplified 2-click firewall, VPN, and integrated switch



Technical data

Ethernet interface	
Number of ports	6 (RJ45 ports)
Transmission speed	10/100 Mbps
Function	
Basic functions	Router with firewall and VPN for 2 tunnels, integrated 5-port switch, metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps/40 Mbps
SNMP – Simple Network Management Protocol	SNMPv1, v2, v3
Security functions	
VPN throughput	max. 40 Mbps (Router mode, VPN bidirectional throughput)
Number of VPN tunnels	2
Encryption methods	DES, 3DES, AES-128, -192, -256
Internet Protocol Security (IPsec) mode	ESP tunnel / ESP transport
Authentication	X.509v3 certificates with RSA or PSK
Data integrity	MD5, SHA-1, SHA 256, SHA-512
Firewall data throughput	max. 130 Mbps (Router mode, default firewall rules, bidirectional throughput)
Firewall rules	Simple stateful inspection firewall, no user firewall, no conditional firewall, no rule sets
Filtering	Incoming or outgoing traffic
Protection against	-
Routing	Standard routing, NAT, 1:1-NAT, port forwarding
Power supply	
Supply voltage	24 V DC (redundant)
Typical current consumption	100 mA (at U _S = 24 V DC)
General data	
Dimensions	W / H / D 45 mm / 130 mm / 114 mm
Ambient temperature (operation)	-20°C ... 60°C
EMC note	Class A product, see page 527

Ordering data		
Type	Order No.	Pcs./Pkt.
FL MGUARD RS2005 TX VPN	2701875	1

Accessories		
SD FLASH 512MB	2988146	1
FL MGUARD LIC LIFETIME FW	2700184	1

Program and configuration memory, plug-in	
License for lifetime software update of FL MGUARD field devices	
License for activating CIFS Integrity Monitoring (CIM) on FL MGUARD	
License for activating the OPC inspector function on an FL MGUARD	
License for activating the firewall/router redundancy function on an FL MGUARD device pair	
License for activating the firewall/router and VPN redundancy function on an FL MGUARD device pair	



Router with intelligent firewall and integrated switch



Router with intelligent firewall, VPN, and integrated switch



Router with intelligent firewall, with VPN as an option



Technical data

6 (RJ45 ports)
10/100 Mbps

Router with intelligent firewall, integrated 4-port managed switch, opt. VPN (opt. for 10 tunnels, up to 250 tunnels with additional license), CIFS Integrity Monitoring (opt.), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps / 40 Mbps

SNMPv1, v2, v3

max. 42 Mbps (Router)

DES, 3DES, AES-128, -192, -256

MD5, SHA-1, SHA 256, SHA-512

max. 130 Mbps (Router mode, default firewall rules, bidirectional throughput)

Configurable stateful inspection firewall with full scope of functions

MAC and IP addresses, ports, protocols

IP spoofing, DoS and Syn Flood Protection

Standard routing, NAT, 1:1-NAT, port forwarding

24 V DC (redundant)
100 mA (at $U_s = 24$ V DC)

45 mm / 130 mm / 114 mm
-20°C ... 60°C

Class A product, see page 527

Technical data

6 (RJ45 ports)
10/100 Mbps

Router with intelligent firewall, integrated 4-port managed switch and VPN for 10 tunnels (opt. up to 250 with additional license), CIFS Integrity Monitoring (opt.), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps / 40 Mbps

SNMPv1, v2, v3

max. 42 Mbps (Router)

10 (up to 250 tunnels with additional license as an option)

DES, 3DES, AES-128, -192, -256

ESP tunnel / ESP transport

X.509v3 certificates with RSA or PSK

MD5, SHA-1, SHA 256, SHA-512

max. 130 Mbps (Router mode, default firewall rules, bidirectional throughput)

Configurable stateful inspection firewall with full scope of functions

MAC and IP addresses, ports, protocols

IP spoofing, DoS and Syn Flood Protection

Standard routing, NAT, 1:1-NAT, port forwarding

24 V DC (redundant)
100 mA (at $U_s = 24$ V DC)

45 mm / 130 mm / 114 mm
-20°C ... 60°C

Class A product, see page 527

Technical data

FL MGuard DELTA TX/TX VPN FL MGuard DELTA TX/TX

2 (RJ45)
10/100 Mbps

Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card

Router with intelligent firewall (VPN, 10 tunnels as an option, up to 250 possible with additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN (as an option): up to 99 Mbps / 35 Mbps (as an option)

SNMPv1, v2, v3

max. 42 Mbps (Router mode, VPN bidirectional throughput)

As an option, 10 tunnels up to 250 tunnels, IPsec (IETF) standard with additional license FL MGuard LIC VPN-10/Order No. 2700194 or FL MGuard LIC VPN-250/Order No. 2700193 or 2700192.

DES, 3DES, AES-128, -192, -256

MD5, SHA-1, SHA 256, SHA-512

max. 130 Mbps (Router mode, default firewall rules, bidirectional throughput)

Configurable stateful inspection firewall with full scope of functions

MAC and IP addresses, ports, protocols

IP spoofing, DoS and Syn Flood Protection

Standard routing, NAT, 1:1-NAT, port forwarding

230 V AC
13 mA

130 mm / 50 mm / 114 mm
5°C ... 40°C

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGuard RS4004 TX/DTX	2701876	1

Accessories

SD FLASH 512MB	2988146	1
FL MGuard LIC LIFETIME FW	2700184	1
FL MGuard LIC CIM	2701083	1
FL MGuard LIC OPC INSP	2702191	1
FL MGuard LIC FW RD	2701356	1
FL MGuard LIC FW/VPN RD	2702193	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGuard RS4004 TX/DTX VPN	2701877	1

Accessories

SD FLASH 512MB	2988146	1
FL MGuard LIC LIFETIME FW	2700184	1
FL MGuard LIC CIM	2701083	1
FL MGuard LIC OPC INSP	2702191	1
FL MGuard LIC FW RD	2701356	1
FL MGuard LIC FW/VPN RD	2702193	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGuard DELTA TX/TX	2700967	1
FL MGuard DELTA TX/TX VPN	2700968	1

Accessories

SD FLASH 512MB	2988146	1
FL MGuard LIC LIFETIME FW	2700184	1
FL MGuard LIC CIM	2701083	1
FL MGuard LIC OPC INSP	2702191	1
FL MGuard LIC FW RD	2701356	1
FL MGuard LIC FW/VPN RD	2702193	1

Security appliances for special applications

The **FL MGUARD...-M** provides all the relevant maritime approvals and is therefore the ideal device for onshore and offshore applications.

The **FL MGUARD...-P** is specifically designed for process technology. In addition to its conformal coating, the device provides ATEX and IECEx approvals, as well as a very wide temperature range. Using the DPI (Deep Packet Inspection) function for OPC Classic and Modbus/TCP, the device can be used as an Application Layer firewall.

The **FL MGUARD CENTERPORT** delivers more than enough performance for large remote maintenance centers or for use as an extremely powerful firewall. To increase availability, the device has two separate power supply units. With optional redundancy licenses, you can develop the device into a high-availability solution.

Notes:

Central device management software, the Device Manager for FL MGUARD devices, can be found on page 342



With maritime approvals



Ethernet interface	
Number of ports	2 (RJ45 ports)
Transmission speed	10/100 Mbps
Function	
Basic functions	Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps/40 Mbps
SNMP – Simple Network Management Protocol	SNMPv1, v2, v3
Security functions	
VPN throughput	max. 40 Mbps (Router mode, VPN bidirectional throughput)
Number of VPN tunnels	10 (up to 250 tunnels with additional license as an option)
Encryption methods	DES, 3DES, AES-128, -192, -256
Internet Protocol Security (IPsec) mode	ESP tunnel / ESP transport
Authentication	X.509v3 certificates with RSA or PSK
Data integrity	MD5, SHA-1, SHA 256, SHA-512
Firewall data throughput	max. 124 Mbps (Router mode, default firewall rules, bidirectional throughput)
Firewall rules	Configurable stateful inspection firewall with full scope of functions
Filtering	MAC and IP addresses, ports, protocols
Protection against	IP spoofing, DoS and Syn Flood Protection
Routing	Standard routing, NAT, 1:1-NAT, port forwarding
Power supply	
Supply voltage	24 V DC (redundant)
Supply voltage range	11 V DC ... 36 V DC
Typical current consumption	100 mA (at U _S = 24 V DC)
General data	
Dimensions	45 mm / 130 mm / 114 mm
Ambient temperature (operation)	-40°C ... 70°C
EMC note	Class A product, see page 527

Description
Security appliance , for special applications

Program and configuration memory, plug-in
License for lifetime software update of FL MGUARD field devices
License for activating CIFS Integrity Monitoring (CIM) on FL MGUARD
License for activating the OPC inspector function on an FL MGUARD
License for activating the firewall/router redundancy function on an FL MGUARD device pair
License for activating the firewall/router and VPN redundancy function on an FL MGUARD device pair

Technical data

2 (RJ45 ports)
10/100 Mbps
Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps/40 Mbps
SNMPv1, v2, v3
max. 40 Mbps (Router mode, VPN bidirectional throughput)
10 (up to 250 tunnels with additional license as an option)
DES, 3DES, AES-128, -192, -256
ESP tunnel / ESP transport
X.509v3 certificates with RSA or PSK
MD5, SHA-1, SHA 256, SHA-512
max. 124 Mbps (Router mode, default firewall rules, bidirectional throughput)
Configurable stateful inspection firewall with full scope of functions
MAC and IP addresses, ports, protocols
IP spoofing, DoS and Syn Flood Protection
Standard routing, NAT, 1:1-NAT, port forwarding

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGUARD RS4000 TX/TX VPN-M	2702465	1

Accessories

SD FLASH 512MB	2988146	1
FL MGUARD LIC LIFETIME FW	2700184	1
FL MGUARD LIC CIM	2701083	1
FL MGUARD LIC OPC INSP	2702191	1
FL MGUARD LIC FW RD	2701356	1



For process engineering applications



High performance with high availability



Technical data
2 (RJ45 ports) 10/100 Mbps
Router with intelligent firewall and OPC/Modbus inspector with ATEX and IECEx approval, from FW 8.5: VPN for up to 250 tunnels, CIFS Integrity Monitoring, redundancy function, metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps / 40 Mbps
SNMPv1, v2, v3
max. 40 Mbps (Router mode, VPN bidirectional throughput)
250 (Firmware 8.5 or later)
DES, 3DES, AES-128, -192, -256 ESP tunnel / ESP transport X.509v3 certificates with RSA or PSK MD5, SHA-1, SHA 256, SHA-512 max. 124 Mbps (Router mode, default firewall rules, bidirectional throughput) Configurable stateful inspection firewall with full scope of functions, deep packet inspection for OPC classic
MAC and IP addresses, ports, protocols IP spoofing, DoS and Syn Flood Protection Standard routing, NAT, 1:1-NAT, port forwarding
24 V DC (redundant) 11 V DC ... 36 V DC 100 mA (at U _S = 24 V DC)
45 mm / 130 mm / 114 mm -40°C ... 70°C Class A product, see page 527

Technical data
4 (RJ45 ports) 10/100/1000 Mbps
Security appliance for up to 3000 parallel VPN tunnels (with additional licenses) and more than 600 Mbps VPN data throughput (with hardware encryption)
SNMPv1, v2, v3
600 Mbps (Router mode, VPN bidirectional throughput)
0 (in the best case, up to 3000 tunnels with additional licenses)
DES, 3DES, AES-128, -192, -256 ESP tunnel / ESP transport X.509v3 certificates with RSA or PSK MD5, SHA-1, SHA 256, SHA-512 2000 Mbps (Router mode, default firewall rules, bidirectional throughput) Configurable stateful inspection firewall with full scope of functions
MAC and IP addresses, ports, protocols IP spoofing, DoS and Syn Flood Protection Standard routing, NAT, 1:1-NAT, port forwarding
- 2x 100 V AC ... 240 V AC (redundant) -
447 mm / 44 mm / 458 mm 0°C ... 45°C

Ordering data		
Type	Order No.	Pcs./Pkt.
FL MGuard RS4000 TX/TX-P	2702259	1
Accessories		
SD FLASH 512MB	2988146	1
FL MGuard LIC LIFETIME FW	2700184	1
FL MGuard LIC CIM	2701083	1
FL MGuard LIC OPC INSP	2702191	1
FL MGuard LIC FW RD	2701356	1
FL MGuard LIC FW/VPN RD	2702193	1

Ordering data		
Type	Order No.	Pcs./Pkt.
FL MGuard CENTERPORT	2702547	1
Accessories		
SD FLASH 512MB	2988146	1
FL MGuard LIC LIFETIME FW	2700184	1
FL MGuard LIC CIM	2701083	1
FL MGuard LIC OPC INSP	2702191	1
FL MGuard LIC FW RD	2701356	1
FL MGuard LIC FW/VPN RD	2702193	1

Firewall/router for office-based/mobile use

The **FL MGuard SMART2** features maximum possible security and performance in a minimum amount of space.

With its robust housing and uncomplicated power supply via any USB port, the **FL MGuard SMART2** is the ideal solution for the mobile protection of critical company resources.

The device is particularly suitable for the mobile and stationary protection of workstations and environments close to the production process with low requirements for industrial hardening.

It can be used as a secure firewall between office and production networks, as a remote maintenance client or as a security router for small workgroups.

Security routers without DIN rail mounting

Security is fundamental for PC-based automation. Do not leave any room for attack.

Distributed protection concepts where automation cells are protected individually provide maximum security.

In order to protect your PC reliably and easily in the network, PCI bus-based **FL MGuard PCI** cards are the ideal choice. mGuard technology features:

- Maximum security
- Optimum performance
- Central management

VPN licenses

Operation with up to 250 parallel VPN tunnels is possible with optional VPN licenses.

Notes:

Central device management software, the Device Manager for FL MGuard devices, can be found on page 342



Router with firewall for mobile use

ERC

Ethernet interface
Number of ports
Transmission speed
Function
Basic functions
SNMP – Simple Network Management Protocol
Security functions
Dynamic Host Configuration Protocol (DHCP) support
Remote syslog logging
VPN throughput
Number of VPN tunnels
Encryption methods
Internet Protocol Security (IPsec) mode
Authentication
Data integrity
1:1 Network Address Translation (NAT) in the VPN
Firewall data throughput
Firewall rules
Filtering
Protection against
Routing
Power supply
Supply voltage
General data
Width
Degree of protection
Ambient temperature (operation)

Description
Router with firewall
- Without VPN
- With VPN

Program and configuration memory, plug-in
License for lifetime software update of FL MGuard field devices
License for activating CIFS Integrity Monitoring (CIM) on FL MGuard
License for activating the OPC inspector function on an FL MGuard
License for activating the firewall/router redundancy function on an FL MGuard device pair
License for activating the firewall/router and VPN redundancy function on an FL MGuard device pair

Technical data	
FL MGuard SMART2 VPN	FL MGuard SMART2
	2 (RJ45)
	10/100 Mbps
Firewall/router for office use or mobile service technicians	

SNMPv1, v2, v3	
Server or Relay Agent	
On external server	
max. 42 Mbps (Router mode, VPN bidirectional throughput)	
10 (up to 250 with license possible)	0 (up to 250 tunnels with additional license as an option)
DES, 3DES, AES-128, -192, -256	
ESP tunnel / ESP transport	-
X.509v3 certificates with RSA or PSK	-
MD5, SHA-1, SHA 256, SHA-512	
Supported	-
max. 130 Mbps (Router mode, default firewall rules, bidirectional throughput)	
Configurable stateful inspection firewall	
MAC and IP addresses, ports, protocols	
IP spoofing, DoS and Syn Flood Protection	
NAT, 1:1-NAT, Port Forwarding	
5 V DC (from USB interface)	
77 mm	
IP30	
0°C ... 40°C	

Ordering data		
Type	Order No.	Pcs./Pkt.
FL MGuard SMART2	2700640	1
FL MGuard SMART2 VPN	2700639	1

Accessories		
FL MGuard LIC LIFETIME FW	2700184	1
FL MGuard LIC CIM	2701083	1
FL MGuard LIC OPC INSP	2702191	1
FL MGuard LIC FW RD	2701356	1
FL MGuard LIC FW/VPN RD	2702193	1



Embedded router/firewall with VPN



Router with firewall and VPN for PCI



Router with firewall and VPN for PCIe

ERC

ERC

ERC

Technical data

1 (RJ45 port) 10/100 Mbps
Embedded router with intelligent firewall and VPN for 10 active tunnels
SNMPv1, v2, v3
Server or Relay Agent On external server max. 40 Mbps (Router mode, VPN bidirectional throughput)
10 (up to 250 tunnels with additional license as an option)
DES, 3DES, AES-128, -192, -256 ESP tunnel / ESP transport X.509v3 certificates with RSA or PSK
MD5, SHA-1, SHA 256, SHA-512 Supported max. 124 Mbps (Router mode, default firewall rules, bidirectional throughput) Configurable stateful inspection firewall with full scope of functions
MAC and IP addresses, ports, protocols IP spoofing, DoS and Syn Flood Protection Standard routing, NAT, 1:1-NAT, port forwarding

5 V DC
56 mm IP00 0°C ... 60°C

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGuard CORE TX VPN	2702831	1

Accessories

SD FLASH 512MB	2988146	1
FL MGuard LIC LIFETIME FW	2700184	1
FL MGuard LIC CIM	2701083	1
FL MGuard LIC OPC INSP	2702191	1
FL MGuard LIC FW RD	2701356	1
FL MGuard LIC FW/VPN RD	2702193	1

Technical data

2 (RJ45) 10/100 Mbps
Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps/40 Mbps
SNMPv1, v2, v3
Server or Relay Agent On external server max. 42 Mbps (Router)
10 (up to 250 tunnels with additional license as an option)
DES, 3DES, AES-128, -192, -256 ESP tunnel / ESP transport X.509v3 certificates with RSA or PSK
MD5, SHA-1, SHA 256, SHA-512 Supported max. 130 Mbps (Router mode, default firewall rules, bidirectional throughput) Configurable stateful inspection firewall with full scope of functions
MAC and IP addresses, ports, protocols IP spoofing, DoS and Syn Flood Protection Standard routing, NAT, 1:1-NAT, port forwarding

-
- IP00 0°C ... 70°C

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGuard PCI4000 VPN	2701275	1

Accessories

SD FLASH 512MB	2988146	1
FL MGuard LIC LIFETIME FW	2700184	1
FL MGuard LIC CIM	2701083	1
FL MGuard LIC OPC INSP	2702191	1
FL MGuard LIC FW RD	2701356	1
FL MGuard LIC FW/VPN RD	2702193	1

Technical data

2 (RJ45) 10/100 Mbps
Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps/40 Mbps
SNMPv1, v2, v3
Server or Relay Agent On external server max. 42 Mbps (Router)
10 (up to 250 tunnels with additional license as an option)
DES, 3DES, AES-128, -192, -256 ESP tunnel / ESP transport X.509v3 certificates with RSA or PSK
MD5, SHA-1, SHA 256, SHA-512 Supported max. 130 Mbps (Router mode, default firewall rules, bidirectional throughput) Configurable stateful inspection firewall with full scope of functions
MAC and IP addresses, ports, protocols IP spoofing, DoS and Syn Flood Protection Standard routing, NAT, 1:1-NAT, port forwarding

-
- IP00 0°C ... 70°C

Ordering data

Type	Order No.	Pcs./Pkt.
FL MGuard PCIE4000 VPN	2701278	1

Accessories

SD FLASH 512MB	2988146	1
FL MGuard LIC LIFETIME FW	2700184	1
FL MGuard LIC CIM	2701083	1
FL MGuard LIC OPC INSP	2702191	1
FL MGuard LIC FW RD	2701356	1
FL MGuard LIC FW/VPN RD	2702193	1

Device Manager for FL MGuard devices

Tool for the central configuration and management of any number of mGuard devices in the field.

- Template-based management tool
- Suitable for remote maintenance applications

FL Network Manager

SNMP-based configuration and firmware update software for the easy startup and monitoring of network components.

- Network topology detection
- Multi-device configuration



Central management software
for FL MGuard



Network management software
for startup and monitoring

	Technical data	Technical data
Hardware requirements		
Processor	> 1 GHz	> 1.5 GHz
Main memory (RAM)	512 Mbyte	2 GByte
Hard disk memory	4 GByte (free memory space (server), 500 MB free memory space (client))	min. 1 GByte
Optical drive	CD-ROM	CD-RW/DVD-RW
Interfaces	Ethernet Port	Ethernet Port
Software requirements		
Operating system	Windows Server 2016 Windows Server 2012 R2 Windows Server 2008 R2 SP1 Windows 10 (only mdm Client) Windows 7 (only mdm Client) Ubuntu 16.04 LTS	Windows® 10 Windows® 8.1 (32-Bit/64-Bit) Windows® 7 (32-Bit/64-Bit)
Basic functions	Voucher for a license for MGUARD Device Manager, the central device management software for MGUARD devices for any number of devices in the field. For installation on a PC. -	The FL Network Manager Basic software simplifies the startup of Managed Switches and provides a central configuration point With just a few clicks, the Network Manager identifies the network devices and, in addition to IP parameter assignment, enables easy multi-device firmware updates and configuration of the most important Industrial Ethernet functions for different types of devices, all at the same time.
Languages supported	English	English
	Ordering data	Ordering data
Description	Type	Type
Central device management software for FL MGUARD devices, for installation on a PC.	Order No.	Order No.
- For any number of devices in the field	Pcs./Pkt.	Pcs./Pkt.
Network management software	FL MGUARD DM UNLIMITED	FL NETWORK MANAGER BASIC
	2981974	2702889
	1	1

Description

Central **device management software** for FL MGuard devices, for installation on a PC.

- For any number of devices in the field

Network management software

PRP redundancy modules for parallel network redundancy

Energy networks rely on particularly high failsafe performance. The new PRP redundancy modules enable parallel redundancy without switch-over time in the event of a fault. You can therefore ensure maximum availability of your network.

Interruption-free communication

- The FL RED 2000E redundancy module is equipped with the Parallel Redundancy Protocol (PRP)
- Interoperability in high-availability networks is possible, as required in the energy sector
- The system continues to operate in the case of redundancy without switch-over time

Robust design

- Developed in accordance with the requirements of IEC 61850-3 and IEEE 1613: complies with the high requirements for network technology in this area
- Able to withstand voltage fluctuations due to a wide input voltage range of 18 V DC ... 58 V DC
- Robust metal housing
- Extended temperature range (-40°C ... +70°C)

Easy handling

- Creation of a high-availability network without configuration
- LED indicators provide on-site information regarding the status of the network and redundancy
- Alarm signal contact indicates the status of the module and network

IEC 61850-3



Ethernet interface	
Number of ports	
Transmission speed	
Transmission distance	
Fiber optic interface	
Interface	
Number of ports	
Transmission speed	
Connection method	
Transmission distance	
Function	
Basic functions	
Status and diagnostic indicators	
Power supply	
Supply voltage	
Residual ripple	
Supply voltage range	
Typical current consumption	
General data	
Dimensions	W / H / D
Degree of protection	
Ambient temperature (operation)	
Permissible humidity (operation)	
Noise emission	
Noise immunity	
EMC note	

Description
Redundancy module
- 3 RJ45 ports
- 1 RJ45 port, 2 LC fiber optic ports (multimode)

Technical data		
	FL RED 2003E PRP	FL RED 2001E PRP 2LC
Number of ports	3 (RJ45 ports)	1 (RJ45 port)
Transmission speed	10/100 Mbps	
Transmission distance	100 m (per segment)	
Interface	-	Ethernet FO
Number of ports	-	2 (LC multimode)
Transmission speed	-	100 Mbps (full duplex)
Connection method	-	LC
Transmission distance	-	2 km (per segment)
Ethernet redundancy module for the Parallel Redundancy Protocol		
LEDs: U _{S1} , U _{S2} (redundant voltage supply), link and activity per port		
24 V DC (redundant)		
48 V DC (redundant)		
3.6 V _{PP}		
18 V DC ... 58 V DC		
250 mA (at U _S = 24 V DC)		
40 mm / 100 mm / 109 mm		
IP20		
-40°C ... 70°C		
10% ... 95% (non-condensing)		
EN 61000-6-4		
IEC 61850-3, IEEE 1613, EN 61000-6-2:2005		
Class A product, see page 527		

Ordering data		
Type	Order No.	Pcs./Pkt.
FL RED 2003E PRP	2701863	1
FL RED 2001E PRP 2LC	2701864	1

Power over Ethernet components

The **FL PD 1001T GT** PoE splitter enables data and power to be separated in order to supply non-PoE-capable end devices via PoE.

The **FL PSE 2TX** PoE module can be used to convert two standard Ethernet ports into two PoE ports.



Power over Ethernet splitter



Power over Ethernet injector



Technical data	
Ethernet interface	
Number of ports	1 (RJ45 port)
Transmission speed	10/100/1000 Mbps
Connection method	RJ45
Ethernet interface (PoE)	
Number of ports	1 (RJ45 port)
Transmission speed	10/100/1000 Mbps
Connection method	RJ45
Function	
Basic functions	PD, complies with IEEE 802.3af/at
Status and diagnostic indicators	LEDs: POE, 24 V DC
Power supply	
Supply voltage	48 V DC (via PoE)
Residual ripple	-
Supply voltage range	44 V DC ... 57 V DC
Typical current consumption	-
General data	
Dimensions	W / H / D 40 mm / 100 mm / 109 mm
Degree of protection	IP20
Ambient temperature (operation)	-40°C ... 70°C
Permissible humidity (operation)	10% ... 95% (non-condensing)
EMC note	Class A product, see page 527

Technical data		
2 (RJ45 ports)		
10/100 Mbps		
RJ45		
2 (RJ45 ports)		
10/100 Mbps		
RJ45		
PSE/midspan, complies with IEEE 802.3af		
LEDs: US, PoE detection per port		
24 V DC (via COMBICON; max. conductor cross section 2.5 mm²)		
3.6 V _{pp}		
18.5 V DC ... 30.5 V DC		
typ. 100 mA (during no load; approx. 1800 mA at the input with maximum load and 25°C ambient temperature)		
General data		
Dimensions	W / H / D 45 mm / 99 mm / 112 mm	
Degree of protection	IP20	
Ambient temperature (operation)	0°C ... 55°C	
Permissible humidity (operation)	30% ... 95% (non-condensing)	
EMC note	Class A product, see page 527	

Ordering data	
Description	
Power over Ethernet splitter	
Power over Ethernet module (PSE)	

Ordering data		
Type	Order No.	Pcs./Pkt.
FL PD 1001 T GT	2891042	1

Ordering data		
Type	Order No.	Pcs./Pkt.
FL PSE 2TX	2891013	1

PoE injectors

- Midspan injectors with a PoE port
- Suitable for retrofitting, e.g., for upstream switch without PoE function
- When connecting to PoE-capable end devices, e.g., IP cameras, both devices negotiate the electrical power requirements autonomously
- DIP switches for selecting the cable pairs for power transmission
- Compliant with IEEE 802.3 af (PoE) and IEEE 802.3 at (PoE+) up to 30 W
- Product versions up to 60 W for 4-pair PoE (PoE++)

RJ45 to RJ45,
30 WRJ45 to RJ45,
60 W

Supply	
Nominal supply voltage	
Supply voltage range	
Max. current consumption	
Ethernet interface	
Connection method	
Ethernet interface (PoE)	
Transmission speed	
Connection method	
Output power	
Nominal output voltage	
Functions	
Basic functions	
General data	
Dimensions	W / H / D
Degree of protection	
Electrical isolation	
Test voltage	
Conformance/approvals	
UL, USA/Canada	
Noxious gas test	
EMC note	

Technical data	
INJ 1000	INJ 1100-T
24 V DC / 48 V DC	
18 V DC ... 57 V DC	
2.1 A	
1.4 A (24 V DC)	
0.7 A (48 V DC)	
RJ45 CAT5e	
10/100/1000 Mbps	
RJ45 socket	
30 W	
54 V DC (PoE)	
PSE/Midspan, compliant with IEEE 802.3af, at	
30.2 mm / 130 mm / 120 mm	
IP20	
-	VCC // FE // PoE
-	1.5 kV AC (50 Hz, 1 min.)
Class I, Div. 2, Groups A, B, C, D, T4	Class I, Zone 2, AEx nA IIC T4, Ex nA IIC Gc X T4 Class I, Division 2, Groups A, B, C, D
ISA-S71.04-1985 G3 Harsh Group A	
Class A product, see page 527	

Ordering data			
Type	Order No.	Pcs./Pkt.	
INJ 1000	2703005	1	
INJ 1000-T	2703006	1	
INJ 1100-T	2703009	1	

Technical data	
INJ 1010	INJ 1110-T
24 V DC / 48 V DC	
18 V DC ... 57 V DC	
4.2 A	
2.73 A (24 V DC)	
1.34 A (48 V DC)	
RJ45 CAT5e	
10/100/1000 Mbps	
RJ45 socket	
60 W	
54 V DC (PoE)	
PSE/Midspan, compliant with IEEE 802.3af, at	
30.2 mm / 130 mm / 120 mm	
IP20	
-	VCC // FE // PoE
-	1.5 kV AC (50 Hz, 1 min.)
Class I, Div. 2, Groups A, B, C, D, T4	Class I, Zone 2, AEx nA IIC T4, Ex nA IIC Gc X T4 Class I, Division 2, Groups A, B, C, D
ISA-S71.04-1985 G3 Harsh Group A	

Ordering data			
Type	Order No.	Pcs./Pkt.	
INJ 1010	2703007	1	
INJ 1010-T	2703008	1	
INJ 1110-T	2703010	1	

Description
PoE injector
- Ambient temperature (operation): 0°C ... +60°C
- Ambient temperature (operation): -40°C ... +75°C
- Ambient temperature (operation): -40°C ... +75°C, electrical isolation

PoE injectors

The midspan injectors connect Ethernet devices without PoE (e.g., switches) to PoE-capable end devices (e.g., IP cameras). As power sourcing equipment (PSE), the injector supplies the required power to a powered device (PD) via the data cable. The injector and end device negotiate the electrical power requirements autonomously.

Features:

- Compliant with IEEE 802.3 af (PoE) and IEEE 802.3 at (PoE+) up to 30 W
- Product versions up to 60 W for 4-pair PoE (PoE++)
- DIP switches for selecting the cable pairs for power transmission
- Versions with IDC, Push-in or screw connection for easily connecting the field cable without the effort of RJ45 connector assembly
- Tool-free shield contacting with strain relief
- Shield current monitoring with visual display of undesirable cable shield currents
- Electrical isolation of the internal power supply unit for protection against short circuits on the PoE side
- Integrated surge protection in accordance with IEC 61643-21 with IEC test classification C2



RJ45 to screw connection



Supply	
Nominal supply voltage	
Supply voltage range	
Max. current consumption	
Ethernet interface	
Connection method	
Ethernet interface (PoE)	
Transmission speed	
Connection method	
Output power	
Nominal output voltage	
Connection cross section rigid / flexible / AWG	
Strain relief	
Functions	
Basic functions	
Shield current monitoring	
Switch-on threshold	
Local diagnostics	
General data	
Dimensions	W / H / D
Degree of protection	
Ambient temperature (operation)	
Electrical isolation	
Test voltage	
Conformance/approvals	
UL, USA/Canada	
Noxious gas test	
EMC note	

Description
PoE injector , with electrical isolation
- Output power up to 30 W (PoE, PoE+)
- Output power up to 60 W (PoE++)

Technical data	
INJ 2101-T	INJ 2111-T
24 V DC / 48 V DC	
18 V DC ... 57 V DC	
2.1 A	4.2 A
1.4 A (24 V DC)	2.73 A (24 V DC)
0.7 A (48 V DC)	1.34 A (48 V DC)
RJ45 CAT5e	
10/100/1000 Mbps	
Screw terminal block	
30 W	60 W
54 V DC (PoE)	
0.14 - 1.5 mm ² / 0.14 - 1.5 mm ² / 28 - 16	
Tool-free	
PSE/Midspan, compliant with IEEE 802.3af, at	
≥ 30 mA	
Yellow LED	
30.2 mm / 130 mm / 120 mm	
IP20	
-40°C ... 75°C	
VCC // SCM + FE // PoE	
1.5 kV AC (50 Hz, 1 min.)	
Class I, Zone 2, AEx nA IIC T4, Ex nA IIC Gc X T4	
Class I, Division 2, Groups A, B, C, D	
ISA-S71.04-1985 G3 Harsh Group A	
Class A product, see page 527	

Ordering data			
Type	Order No.	Pcs./Pkt.	
INJ 2101-T	2703011	1	
INJ 2111-T	2703013	1	



RJ45 to IDC connection



RJ45 to Push-in connection



Technical data

INJ 2102-T INJ 2112-T

24 V DC / 48 V DC
18 V DC ... 57 V DC

2.1 A 4.2 A
1.4 A (24 V DC) 2.73 A (24 V DC)
0.7 A (48 V DC) 1.34 A (48 V DC)

RJ45 CAT5e

10/100/1000 Mbps
IDC connection

30 W 60 W

54 V DC (PoE)
0.14 - 0.34 mm² / 0.14 - 0.34 mm² / 26 - 22
Tool-free

PSE/Midspan, compliant with IEEE 802.3af, at

≥ 30 mA
Yellow LED

30.2 mm / 130 mm / 120 mm
IP20

-40°C ... 75°C
VCC // SCM + FE // PoE
1.5 kV AC (50 Hz, 1 min.)

Class I, Zone 2, AEx nA IIC T4, Ex nA IIC Gc X T4
Class I, Division 2, Groups A, B, C, D
ISA-S71.04-1985 G3 Harsh Group A

Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
INJ 2102-T	2703012	1
INJ 2112-T	2703014	1

Technical data

INJ 2103-T INJ 2113-T

24 V DC / 48 V DC
18 V DC ... 57 V DC

2.1 A 4.2 A
1.4 A (24 V DC) 2.73 A (24 V DC)
0.7 A (48 V DC) 1.34 A (48 V DC)

RJ45 CAT5e

10/100/1000 Mbps
Push-in connection

30 W 60 W

54 V DC (PoE)
0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 26 - 16
Tool-free

PSE/Midspan, compliant with IEEE 802.3af, at

≥ 30 mA
Yellow LED

30.2 mm / 130 mm / 120 mm
IP20

-40°C ... 75°C
VCC // SCM + FE // PoE
1.5 kV AC (50 Hz, 1 min.)

Class I, Zone 2, AEx nA IIC T4, Ex nA IIC Gc X T4
Class I, Division 2, Groups A, B, C, D
ISA-S71.04-1985 G3 Harsh Group A

Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
INJ 2103-T	1004065	1
INJ 2113-T	1004066	1

IP communication via any two-wire cables up to 20 km

Existing two-wire cables can be used for networking. The system can be extended during operation without causing any adverse impact.

Basic features of fast startup via Plug and Play

- No configuration or settings necessary
- Automatic topology and data rate detection saves time and money
- Redundancy by means of RSTP (Rapid Spanning Tree Protocol)
- VLAN (Virtual Local Area Network) for logically separated IP networks
- Flexible use: point-to-point with double the bandwidth in 4-wire operation as well as line and ring topology with up to 50 devices

Unmanaged Ethernet extender

- No network configuration or IP address required
- Transparent transmission of all standard protocols including EtherNet/IP™, Modbus/TCP, PROFINET, PROFI-safe, EtherCAT®, KNX, BACnet/IP, etc.

Easy connection and monitoring of large networks

All extender devices and paths can be easily monitored remotely using a single managed device.

Managed Ethernet extender

- Alerts sent regarding all system events via SNMP (Simple Network Management Protocol)
- Remote diagnostics via IP: web-based or SNMP
- Integrated, replaceable SHDSL surge protection, automatic notification when replacement threshold reached or in the event of overload

Separate critical IP networks virtually with VLAN and ensure availability by means of RSTP redundancy

VLAN and RSTP are now also supported by the new firmware v5.xx. A free upgrade is available for devices that have already been installed.

VLAN – Virtual, logically separated IP networks

VLAN enables you to separate physical networks into logical subnetworks. As a result, communication is only possible within a VLAN, thereby increasing security in the overall network.

Startup without expert knowledge

- VLAN configuration via software wizard
- Replacement during servicing via Plug and Play

Redundancy by means of RSTP

RSTP enables you to set up redundant ring or point-to-point topologies. The protocol automatically disables duplicate or failed paths, thereby increasing network availability.

i Your web code: #0943

Supply
Supply voltage range
Supply voltage

Nominal current consumption

Ethernet interface
Connection method
Transmission speed
SHDSL interface
Connection method
Transmission speed

USB interface
Connection method
Functions
Management

Digital output
Number of outputs
Signal range

Behavior of outputs

General data
Dimensions
Ambient temperature (operation)

W / H / D

Electrical isolation
Test voltage
Electromagnetic compatibility
EMC note

Description
Ethernet extender , for distances of up to 20 km on in-house copper cables
- for point-to-point, line, ring, and star structures
- for point-to-point connections

System power supply , primary-switched
DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device

Replaceable surge protection module , with two-wire protection for floating SHDSL cables, two-level protective circuit

DATATRAB adapter , protective adapter for insertion in the data cable
DATATRAB adapter , protective adapter with RJ45 and screw connection for two SHDSL telecommunications interfaces

Program and configuration memory, plug-in



**Managed Ethernet extender, 2 SHDSL ports,
replaceable surge protection**



**Managed Ethernet extender, 1 SHDSL port,
replaceable surge protection**



**Unmanaged Ethernet extender,
2 SHDSL ports**



Technical data
10 V DC ... 60 V DC 24 V DC $\pm 5\%$
90 mA (60 V DC)
RJ45 socket 10/100 Mbps, auto negotiation SHDSL interface in accordance with ITU-T G.991.2.bis Push-in spring connection 4-wire operation: 64 kbps ... 30 Mbps 2-wire operation: 32 kbps ... 15.3 Mbps
-
Web-based management: Diagnostics, log book, customized configuration
2
Depends on the operating voltage ≤ 500 mA (Short-circuit-proof)
-
60 mm / 130 mm / 160 mm -25°C ... 60°C
VCC // Ethernet // DSL (A) // DSL (B) // FE 1.5 kV AC (50 Hz, 1 min.) Conformance with EMC Directive 2014/30/EU Class A product, see page 527

Technical data
10 V DC ... 60 V DC 24 V DC $\pm 5\%$
80 mA (60 V DC)
RJ45 socket 10/100 Mbps, auto negotiation SHDSL interface in accordance with ITU-T G.991.2.bis Push-in spring connection 2-wire operation: 32 kbps ... 15.3 Mbps
-
Web-based management: Diagnostics, log book, customized configuration
1
Depends on the operating voltage ≤ 500 mA (Short-circuit-proof)
-
60 mm / 130 mm / 160 mm -25°C ... 60°C
VCC // Ethernet // DSL (A/B) // FE 1.5 kV AC (50 Hz, 1 min.) Conformance with EMC Directive 2014/30/EU Class A product, see page 527

Technical data
18 V DC ... 30 V DC 24 V DC $\pm 5\%$ (as an alternative or redundant, via backplane bus contact and system power supply)
< 180 mA (24 V DC)
RJ45 socket, shielded 10/100 Mbps, auto negotiation SHDSL interface in accordance with ITU-T G.991.2.bis 2 x 2-pos. COMBICON plug-in screw terminal blocks 4-wire operation: 64 kbps ... 30 Mbps 2-wire operation: 32 kbps ... 15.3 Mbps USB 2.0 Mini-USB type B, 5-pos.
Plug and Play, diagnostics via PSI-CONF software or web-based management (only with managed Ethernet extenders)
2
Depends on the operating voltage ≤ 150 mA (Short-circuit-proof) Deactivated for device supply via DIN rail connector
35 mm / 99 mm / 114.5 mm -20°C ... 60°C (Freestanding (40 mm spacing to the right and left), no supply of other modules via the device)
VCC // Ethernet // DSL (A) // DSL (B) // FE 1.5 kV _{max} (50 Hz, 1 min.) Conformance with EMC Directive 2014/30/EU Class A product, see page 527

Ordering data		
Type	Order No.	Pcs./Pkt.
TC EXTENDER 6004 ETH-2S	2702255	1

Ordering data		
Type	Order No.	Pcs./Pkt.
TC EXTENDER 4001 ETH-1S	2702253	1

Ordering data		
Type	Order No.	Pcs./Pkt.
TC EXTENDER 2001 ETH-2S	2702409	1

Accessories		
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1
TC EXTENDER PT-IQ-2S	2702258	1
DT-LAN-CAT.6+	2881007	1
SD FLASH 512MB	2988146	1

Accessories		
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1
TC EXTENDER PT-IQ-1S	2702257	1
DT-LAN-CAT.6+	2881007	1
SD FLASH 512MB	2988146	1

Accessories		
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
DT-TELE-SHDSL	2801593	1

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

General features

- Auto negotiation and auto MDI/MDIX
- Connection monitoring with LFPT (link fault pass through)
- Signal LEDs for activity, link status, 10/100 Mbps
- Backplane bus contact, enabling alternative or redundant 24 V power supply

Devices with 1300 nm wavelength

The **FL MC EF 1300...** media converters support universal use.

Features:

- 1300 nm wavelength
- Multimode or single mode fiberglass cable
- B-FOC (ST®) or SC duplex

Devices with WDM technology

The **FL MC EF WDM...** media converters enable full duplex communication via a single glass fiber thanks to WDM (wavelength division multiplex) technology.

Features:

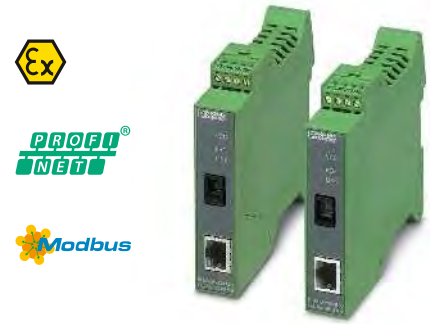
- 1310 nm and 1550 nm wavelengths for transmitting and receiving
- Multimode or single mode fiberglass cable
- SC simplex connection

Devices with 660 nm wavelength

The **FL MC EF 660 SCRJ** media converter is designed for use in networks covering short distances.

Features:

- 660 nm wavelength
- Polymer and PCF fibers
- SC-RJ connection
- Easy connection of the FO connector
- LED bar graph for signaling the optical receiving capacity



WDM technology
Single-fiber transmission



Ex:

Supply	
Supply voltage range	
Supply voltage range	
Nominal current consumption	
FO interface	
Wavelength	
Transmission distance incl. 3 dB system reserve	
Signal LEDs	
Ethernet interface	
Connection method	
Transmission speed	
Auto negotiation modes	
Transmission distance	
Link through	
MDI-/MDI-X switchover	
Signal LEDs	
General data	
Dimensions	W / H / D
Ambient temperature (operation)	
Electrical isolation	
Test voltage	
Conformance/approvals	
ATEX	
UL, USA/Canada	
EMC note	

Technical data	
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 power supply)	
< 110 mA (24 V DC)	
1550 nm (send) / 1310 nm (receive)	
38 km (with F-E 9/125 0.36 dB/km)	
34 km (with F-E 9/125 0.4 dB/km)	
28 km (with F-E 9/125 0.5 dB/km)	
21 km (with F-G 62.5/125 0.7 dB/km F 1000)	
5.5 km (with F-G 62.5/125 2.6 dB/km F 600)	
21 km (with F-G 50/125 0.7 dB/km F 1200)	
9 km (with F-G 50/125 1.6 dB/km F 800)	
Far end fault (red LED), link status (yellow LED)	
RJ45 socket, shielded	
10/100 Mbps	
Auto	
100 m (shielded twisted pair)	
Link fault pass through	
Auto-MDI(X)	
Activity, link status, 10/100 Mbps	
22.5 mm / 99 mm / 114.5 mm	
-40°C ... 65°C	
VCC // FE // Ethernet	
1.5 kV _{rms} (50 Hz, 1 min.)	
II 3 G Ex nA IIC T4 Gc X	
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	
Class A product, see page 527	

Description
FO converter , for converting 10/100Base-TX to a single mode optical fiber, WDM technology
WDM set with devices A and B, SC simplex connection
WDM device A, SC simplex connection
WDM device B, SC simplex connection
FO converter , for converting 10/100Base-TX to multimode fiberglass (1300 nm)
- Connection: SC duplex
- Connection: B-FOC (ST®)
FO converter , for converting 10/100Base-TX to single mode fiberglass (1300 nm)
- Connection: SC duplex
FO converter , for converting 100Base-T to polymer or PCF fiber (660 nm)
- Connection: SC-RJ

Ordering data		
Type	Order No.	Pcs./Pkt.
FL MC EF WDM-SET SC	2902660	1
FL MC EF WDM-A SC	2902658	1
FL MC EF WDM-B SC	2902659	1



Universal devices with 1300 nm
for multimode fiberglass



Universal device with 1300 nm
for single mode fiberglass



Universal device with 660 nm
for polymer and PCF fibers



Technical data
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 power supply)
< 100 mA (24 V DC)
1300 nm
6.4 km (with F-G 50/125 0.7 dB/km F 1000)
2.8 km (with F-G 50/125 1.6 dB/km F 800)
10 km (with F-G 62.5/125 0.7 dB/km F 1000)
3 km (with F-G 62.5/125 2.6 dB/km F 600)
Far end fault (red LED), link status (yellow LED)
RJ45 socket, shielded
10/100 Mbps
Auto
100 m (shielded twisted pair)
Link fault pass through
Auto-MDI(X)
Activity, link status, 10/100 Mbps
22.5 mm / 99 mm / 114.5 mm
-40°C ... 65°C
VCC // FE // Ethernet
1.5 kV _{rms} (50 Hz, 1 min.)
Ex II 3 G Ex nA IIC T4 Gc X Ex II (2) D [Ex op is Db] IIC (PTB 06 ATEX 2042 U) Ex II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U)
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
Class A product, see page 527

Technical data
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 power supply)
< 100 mA (24 V DC)
1300 nm
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)
Far end fault (red LED), link status (yellow LED)
RJ45 socket, shielded
10/100 Mbps
Auto
100 m (shielded twisted pair)
Link fault pass through
Auto-MDI(X)
Activity, link status, 10/100 Mbps
22.5 mm / 99 mm / 114.5 mm
-40°C ... 65°C
VCC // FE // Ethernet
1.5 kV _{rms} (50 Hz, 1 min.)
Ex II 3 G Ex nA IIC T4 Gc X
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
Class A product, see page 527

Technical data
18 V DC ... 32 V DC (via COMBICON plug-in screw terminal block)
18 V DC ... 32 V DC (as an alternative or redundant, via backplane bus contact and system power supply)
≤ 85 mA (24 V DC)
660 nm
50 m (Polymer fiber with F-P 980/1000 230 dB/km)
100 m (PCF fiber with F-K 200/230 8 dB/km)
Optical receiver power: Very good (green), good (green), critical (yellow), fault (red)
RJ45 socket, shielded
100 Mbps
-
100 m (shielded twisted pair)
Link fault pass through
-
-
22.5 mm / 99 mm / 114.5 mm
-40°C ... 60°C
VCC // Ethernet
1.5 kV _{rms} (50 Hz, 1 min.)
-
-
Class A product, see page 527

Ordering data		
Type	Order No.	Pcs./Pkt.
FL MC EF 1300 MM SC	2902853	1
FL MC EF 1300 MM ST	2902854	1

Ordering data		
Type	Order No.	Pcs./Pkt.
FL MC EF 1300 SM SC	2902856	1

Ordering data		
Type	Order No.	Pcs./Pkt.
FL MC EF 660 SCRJ	2702944	1

Media converters

The class 1000 and 2000 media converters offer a robust design in metal housing. From the basic version to use in energy applications, they meet a wide range of different requirements.

General features

- 1300 nm wavelength
- Connection monitoring with LFPT (link fault pass through)
- Signal LEDs for activity, link status, 10/100 Mbps
- Robust design in metal housing for high EMC requirements

Devices for basic requirements

The **FL MC 1000...** media converters offer an easy and inexpensive entry-level solution for converting to FO technology.

Features:

- Multimode fiberglass cables
- B-FOC (ST®) or SC duplex
- Auto negotiation and auto MDI/MDIx

Devices for real-time applications

Thanks to their short delay times (latency), the **FL MC 2000T...** media converters are suitable for applications with real-time Ethernet protocols.

Features:

- Store-and-forward or pass-through mode can be selected via DIP switch (low latency, 835 ns)
- Multimode or single mode fiberglass cable
- B-FOC (ST®) or SC duplex
- Extended temperature range (-40°C ... +75°C)

Devices for harsh requirements

The **FL MC 2000E...** media converters are designed for use in energy technology. Thanks to their robust design, they are used in environments subject to high levels of EMI around switchgear.

Features:

- Multimode or single mode fiberglass cable
- LC duplex connection
- IEC 61850 and IEEE 1613
- Extended temperature range (-40°C ... +75°C)
- Redundant power supply with a wide range from 12 ... 57 V DC (24, 36, 48 V DC)

PROFI[®]
NET



**Basic requirements,
multimode fiberglass**



Technical data

Supply	
Supply voltage range	12 V DC ... 48 V DC
Nominal current consumption	73 mA (24 V DC)
FO interface	
Wavelength	1310 nm
Transmission distance 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)
Signal LEDs	LNK/ACT
Ethernet interface	
Connection method	RJ45 socket, shielded
Transmission speed	10/100 Mbps
Auto negotiation modes	Auto
Link through	Link fault pass through
MDI-/MDI-X switchover	Auto-MDI(X)
Signal LEDs	LNK/ACT, 100
Switching output	
Contact type	-
Max. switching voltage	-
General data	
Dimensions	W / H / D 28 mm / 110 mm / 70 mm
Ambient temperature (operation)	0°C ... 60°C
Electrical isolation	VCC // FE // Ethernet
Test voltage	1500 V AC (500 V AC, 1 minute)
EMC note	Class A product, see page 527

Ordering data

Description	Type	Order No.	Pcs./Pkt.
FO converter , for converting 10/100Base-TX to multimode fiberglass (1300 nm)			
- Connection: SC duplex	FL MC 1000 SC	2891320	1
- Connection: B-FOC (ST®)	FL MC 1000 ST	2891321	1
- Connection: LC duplex			
FO converter , for converting 10/100Base-TX to single mode fiberglass (1300 nm)			
- Connection: SC duplex			
- Connection: SC duplex			
- Connection: LC duplex			

PROFI[®]
NET

Modbus

Real-time protocols,
multimode fiberglassPROFI[®]
NET

Modbus

Real-time protocols,
single mode fiberglassdnp
Distributed
Network
Protocol

IEC 61850-3

Harsh ambient conditions,
IEC 61850

Ex: EAC

Ex: EAC

Ex: EAC

Technical data

Technical data

Technical data

FL MC 2000T SM20 SC

FL MC 2000T SM40 SC

FL MC 2000E LC

FL MC 2000E SM40 LC

12 V DC ... 48 V DC
110 mA (24 V DC)12 V DC ... 48 V DC
110 mA (24 V DC)12 V DC ... 57 V DC
110 mA (24 V DC)1310 nm
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)1310 nm
20 km (fiberglass with F-G 9/125 0.36 dB/km)
40 km (fiberglass with F-G 9/125 0.36 dB/km)
36 km (fiberglass with F-G 9/125 0.4 dB/km)
29 km (fiberglass with F-G 9/125 0.5 dB/km)1310 nm
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)
40 km (fiberglass with F-G 9/125 0.36 dB/km)
36 km (fiberglass with F-G 9/125 0.4 dB/km)
29 km (fiberglass with F-G 9/125 0.5 dB/km)

LNK/ACT

LNK/ACT

LNK/ACT

RJ45 socket, shielded
10/100 Mbps
Auto
Link fault pass through
Auto-MDI(X)
LNK/ACT, 100RJ45 socket, shielded
10/100 Mbps
Auto
Link fault pass through
Auto-MDI(X)
LNK/ACT, 100RJ45 socket, shielded
100 Mbps
Link fault pass through
Auto-MDI(X)
LNK/ACT, 1001 x N/C contact
≤ 250 V AC1 x N/C contact
≤ 250 V AC1 x N/C contact
≤ 250 V AC28 mm / 110 mm / 70 mm
-40°C ... 75°C
VCC // FE // Ethernet
1500 V AC (500 V AC, 1 minute)
Class A product, see page 52728 mm / 110 mm / 70 mm
-40°C ... 75°C
VCC // FE // Ethernet
1500 V AC (500 V AC, 1 minute)
Class A product, see page 52730 mm / 130 mm / 100 mm
-40°C ... 75°C
VCC // FE // Ethernet
1500 V AC (500 V AC, 1 minute)
Class A product, see page 527

Ordering data

Ordering data

Ordering data

Type	Order No.	Pcs./Pkt.
FL MC 2000T SC	2891315	1
FL MC 2000T ST	2891316	1

Type	Order No.	Pcs./Pkt.
FL MC 2000T SM20 SC	2891317	1
FL MC 2000T SM40 SC	2891318	1

Type	Order No.	Pcs./Pkt.
FL MC 2000E LC	2891056	1
FL MC 2000E SM40 LC	2891156	1

Serial device servers, gateways, and proxies

Device servers and gateways for implementing serial protocols for Ethernet

The new device servers and gateways offer versions with multiple serial ports and Ethernet ports, as well as advanced security functions. That's why they are particularly suitable for sensitive industries such as energy supply, infrastructure or the process industry, where increased requirements are placed on Ethernet security.

Hardware

The serial device servers and gateways are available in different hardware versions:

- 1 x Ethernet and 1 x RS-232/422/485
- 1 x Ethernet and 2 x RS-232/422/485
- 2 x Ethernet and 2 x RS-232/422/485
- 2 x Ethernet and 4 x RS-232/422/485

Functions:

Each hardware design is available in four different versions.

Device servers:

- Protocol-transparent transmission of serial data via Ethernet

Gateways:

- Converting Modbus/RTU to Modbus/TCP
- Converting any serial data (RAW/ASCII) to Modbus/TCP
- Converting any serial data (RAW/ASCII) to EtherNet/IP™
- Converting any serial data (RAW/ASCII) to PROFINET

Features:

- 256-bit AES encryption with additional programmable, password-protected settings
- Easy installation and startup
- Web-based management
- Monitoring and diagnostics of serial ports
- Easy connection to a variety of serial devices with D-SUB connectors from the SUBCON range



1 x Ethernet and
1 x RS-232/422/485



Supply
Supply voltage range
Nominal current consumption
Serial port
Interfaces
Connection method
Data format/encoding
Data flow control/protocols
Transmission speed
Termination resistor
Ethernet interface
Connection method
Transmission speed
Transmission distance
Auxiliary protocols
Functions
Management
General data
Dimensions
Ambient temperature (operation)
Electrical isolation
Test voltage
Electromagnetic compatibility
Conformance/approvals
UL, USA/Canada
EMC note

Technical data
10.8 V DC ... 30 V DC (via COMBICON plug-in screw terminal block)
48 mA (24 V DC)
RS-232, RS-422, RS-485
D-SUB 9 plug
5/6/7/8 Data bits, 1/2 Stop bits, None/Even/Odd/Mark/Space Parity
Software handshake, Xon/Xoff or hardware handshake RTS/CTS
0.3; 0.6; 1.2; 2.4; 4.8; 9.6; 19.2; 38.4; 57.6; 115.2; 230.4 Kbps
120 Ω
RJ45 socket, shielded
10/100 Mbps, auto negotiation
≤ 100 m (shielded twisted pair)
ARP, DHCP (Client), PING
Web-based management
22.5 mm / 99 mm / 115 mm
-40°C ... 70°C
IEC UL 61010-1 (VCC // Ethernet)
1.5 kV _{ms} (50 Hz, 1 min.)
Conformance with EMC Directive 2014/30/EU
Class I, Div. 2, Groups A, B, C, D T4A
Class A product, see page 527

Description
Serial device servers
- Device servers for protocol-transparent transmission of serial data via Ethernet
Modbus gateway
- Modbus gateways for converting Modbus/TCP to Modbus/RTU
ASCII converters
- ASCII to Modbus/TCP
- ASCII to EtherNet/IP™
- ASCII to PROFINET
D-SUB plug, with screw connection
- 9-pos., socket
D-SUB plug, with two cable entries, universal type,
pin assignment 1,2,3,4,5,6,7,8,9 on every screw terminal block
- Axial, 9-pos., socket

Ordering data		
Type	Order No.	Pcs./Pkt.
GW DEVICE SERVER 1E/1DB9	2702758	1
GW MODBUS TCP/RTU 1E/1DB9	2702764	1
GW MODBUS TCP/ASCII 1E/1DB9	2702768	1
GW EIP/ASCII 1E/1DB9	2702772	1
GW PN/ASCII 1E/1DB9	1021080	1

Accessories		
SUBCON 9/F-SH	2761499	1
SUBCON-PLUS-F/AX 9	2311797	1



**1 x Ethernet and
2 x RS-232/422/485**



**2 x Ethernet and
2 x RS-232/422/485**



**2 x Ethernet and
4 x RS-232/422/485**



Technical data
10.8 V DC ... 30 V DC (via COMBICON plug-in screw terminal block)
76 mA (24 V DC)
RS-232, RS-422, RS-485 D-SUB 9 plug 5/6/7/8 Data bits, 1/2 Stop bits, None/Even/Odd/Mark/Space Parity
Software handshake, Xon/Xoff or hardware handshake RTS/CTS
0.3; 0.6; 1.2; 2.4; 4.8; 9.6; 19.2; 38.4; 57.6; 115.2; 230.4 Kbps
120 Ω
RJ45 socket, shielded 10/100 Mbps, auto negotiation ≤ 100 m (shielded twisted pair) ARP, DHCP (Client), PING
Web-based management
22.5 mm / 99 mm / 115 mm -40°C ... 70°C IEC UL 61010-1 (VCC // Ethernet) 1.5 kV _{rms} (50 Hz, 1 min.) Conformance with EMC Directive 2014/30/EU
Class I, Div. 2, Groups A, B, C, D T4A Class A product, see page 527

Technical data
10.8 V DC ... 30 V DC (via COMBICON plug-in screw terminal block)
88 mA (24 V DC)
RS-232, RS-422, RS-485 D-SUB 9 plug 5/6/7/8 Data bits, 1/2 Stop bits, None/Even/Odd/Mark/Space Parity
Software handshake, Xon/Xoff or hardware handshake RTS/CTS
0.3; 0.6; 1.2; 2.4; 4.8; 9.6; 19.2; 38.4; 57.6; 115.2; 230.4 Kbps
120 Ω
RJ45 socket, shielded 10/100 Mbps, auto negotiation ≤ 100 m (shielded twisted pair) ARP, DHCP (Client), PING
Web-based management
45 mm / 99 mm / 115 mm -40°C ... 70°C IEC UL 61010-1 (VCC // Ethernet) 1.5 kV _{rms} (50 Hz, 1 min.) Conformance with EMC Directive 2014/30/EU
Class I, Div. 2, Groups A, B, C, D T4A Class A product, see page 527

Technical data
10.8 V DC ... 30 V DC (via COMBICON plug-in screw terminal block)
110 mA (24 V DC)
RS-232, RS-422, RS-485 D-SUB 9 plug 5/6/7/8 Data bits, 1/2 Stop bits, None/Even/Odd/Mark/Space Parity
Software handshake, Xon/Xoff or hardware handshake RTS/CTS
0.3; 0.6; 1.2; 2.4; 4.8; 9.6; 19.2; 38.4; 57.6; 115.2; 230.4 Kbps
120 Ω
RJ45 socket, shielded 10/100 Mbps, auto negotiation ≤ 100 m (shielded twisted pair) ARP, DHCP (Client), PING
Web-based management
45 mm / 99 mm / 115 mm -40°C ... 70°C IEC UL 61010-1 (VCC // Ethernet) 1.5 kV _{rms} (50 Hz, 1 min.) Conformance with EMC Directive 2014/30/EU
Class I, Div. 2, Groups A, B, C, D T4A Class A product, see page 527

Ordering data		
Type	Order No.	Pcs./Pkt.
GW DEVICE SERVER 1E/2DB9	2702760	1
GW MODBUS TCP/RTU 1E/2DB9	2702765	1
GW MODBUS TCP/ASCII 1E/2DB9	2702769	1
GW EIP/ASCII 1E/2DB9	2702773	1
GW PN/ASCII 1E/2DB9	1021058	1

Ordering data		
Type	Order No.	Pcs./Pkt.
GW DEVICE SERVER 2E/2DB9	2702761	1
GW MODBUS TCP/RTU 2E/2DB9	2702766	1
GW MODBUS TCP/ASCII 2E/2DB9	2702770	1
GW EIP/ASCII 2E/2DB9	2702774	1
GW PN/ASCII 2E/2DB9	1021056	1

Ordering data		
Type	Order No.	Pcs./Pkt.
GW DEVICE SERVER 2E/4DB9	2702763	1
GW MODBUS TCP/RTU 2E/4DB9	2702767	1
GW MODBUS TCP/ASCII 2E/4DB9	2702771	1
GW EIP/ASCII 2E/4DB9	2702776	1
GW PN/ASCII 2E/4DB9	1020882	1

Accessories		
SUBCON 9/F-SH	2761499	1
SUBCON-PLUS-F/AX 9	2311797	1

Accessories		
SUBCON 9/F-SH	2761499	1
SUBCON-PLUS-F/AX 9	2311797	1

Accessories		
SUBCON 9/F-SH	2761499	1
SUBCON-PLUS-F/AX 9	2311797	1

Device servers for converting serial interfaces



The **FL COMSERVER...232/422/485** products are used to integrate serial RS-232/RS-422/RS-485 interfaces into existing Ethernet networks. This provides an easy way of implementing functions such as cable replacement, network integration or a Modbus gateway.

Cable replacement

Two devices in combination tunnel serial connections via Ethernet, using either the TCP or UDP protocol.

Network integration

You can integrate automation devices such as controllers or frequency inverters into a network using corresponding programming and diagnostics software. COM diversion software creates a virtual COM port on the PC and transmits the data to the FL COMSERVER.

Modbus gateway

The integrated Modbus gateway function provided in FL COMSERVER UNI converts serial Modbus ASCII or RTU data into Modbus/TCP. Naturally, the conversion process also works in the opposite direction.

Features common to all devices:

- Serial interfaces: RS-232, RS-422, RS-485
- 10/100 Base-T(X) interface
- Software for virtual COM ports supplied as standard
- Extended temperature range (-25°C ... +60°C)
- Redundant power supply and modular station configuration with DIN rail connectors
- 3-way electrical isolation VCC // RS-232/RS-422/RS-485 // network
- Integration into network management tools and visualization systems with the support of SNMP services
- LED diagnostic indicators
- Configuration via web-based management

FL COMSERVER UNI...

- Supports TCP, UDP, Modbus TCP/RTU/ASCII
- Can be used exactly as required on Modbus master or slave

FL COMSERVER BASIC...

- Best-value version
- Supports TCP and UDP

Supply

Supply voltage range

Supply voltage range

Nominal current consumption

Serial port

Interfaces

Connection method

RS-232

RS-422

RS-485

Data format/encoding

Data flow control/protocols

Transmission speed

Termination resistor

Ethernet interface

Connection method

Transmission speed

Transmission distance

Supported protocols

Auxiliary protocols

Functions

Management

General data

Dimensions

W / H / D

Ambient temperature (operation)

Electrical isolation

Test voltage

Electromagnetic compatibility

Conformance/approvals

UL, USA/Canada

EMC note

Description

FL COMSERVER...232/422/485, for converting serial interfaces to Ethernet. COM port redirector software and additional software supplied as standard

TCP, UDP, Modbus, PPP

TCP, UDP

DIN rail connector

System power supply, primary-switched



**Universal device – Modbus gateway
between RTU/ASCII and TCP**



**Basic version for redirector operation –
TCP and UDP**



Technical data

19.2 V AC/DC ... 28.8 V AC/DC (via COMBICON plug-in screw terminal block)
22.8 V DC ... 25.2 V DC (as an alternative or redundant, via backplane bus contact and system power supply)

100 mA (24 V DC)

RS-232, RS-422, RS-485

D-SUB 9 plug

Plug-in/screw connection via COMBICON

Plug-in/screw connection via COMBICON

UART/NRZ: 7/8 Bit Data, 1/2 Bit Stop, None/Even/Odd Parity

Software handshake, Xon/Xoff, or hardware handshake RTS/CTS // 3964 R compatible, Modbus RTU/ASCII

0.3; 0.6; 1.2; 2.4; 4.8; 7.2; 9.6; 19.2; 38.4; 57.6; 115.2; 187.5; 230.4 kbps
390 Ω / 180 Ω / 390 Ω (configurable)

RJ45 socket, shielded

10/100 Mbps, auto negotiation

≤ 100 m (shielded twisted pair)

TCP/IP, UDP, Modbus (TCP, RTU/ASCII), PPP

ARP, DHCP, BOOTP, SNMP, RIP, RARP, HTTP, TFTP, ICMP

Web-based management, SNMP, emergency access with Telnet and serial

22.5 mm / 99 mm / 116 mm

-25°C ... 60°C

DIN EN 50178 (VCC // Ethernet // Serial)

1.5 kV_{rms} (50 Hz, 1 min.)

Conformance with EMC Directive 2014/30/EU

508 Listed

Class I, Div. 2, Groups A, B, C, D

Class A product, see page 527

Technical data

19.2 V AC/DC ... 28.8 V AC/DC (via COMBICON plug-in screw terminal block)
22.8 V DC ... 25.2 V DC (as an alternative or redundant, via backplane bus contact and system power supply)

100 mA (24 V DC)

RS-232, RS-422, RS-485

D-SUB 9 plug

Plug-in/screw connection via COMBICON

Plug-in/screw connection via COMBICON

UART/NRZ: 7/8 Bit Data, 1/2 Bit Stop, None/Even/Odd Parity

Software handshake, Xon/Xoff or hardware handshake RTS/CTS

0.3; 0.6; 1.2; 2.4; 4.8; 7.2; 9.6; 19.2; 38.4; 57.6; 115.2; 187.5; 230.4 kbps
390 Ω / 180 Ω / 390 Ω

RJ45 socket, shielded

10/100 Mbps, auto negotiation

≤ 100 m (shielded twisted pair)

TCP/IP, UDP

ARP, DHCP, BOOTP, SNMP, RIP, RARP, HTTP, TFTP, ICMP

Web-based management, SNMP, emergency access with Telnet and serial

22.5 mm / 99 mm / 116 mm

-25°C ... 60°C

DIN EN 50178 (VCC // Ethernet // Serial)

1.5 kV_{rms} (50 Hz, 1 min.)

Conformance with EMC Directive 2014/30/EU

508 Listed

Class I, Div. 2, Groups A, B, C, D

Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL COMSERVER UNI 232/422/485	2313452	1

Accessories

ME 22.5 TBUS 1.5/ 5-ST-3,81 GN	2707437	50
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL COMSERVER BASIC 232/422/485	2313478	1

Accessories

ME 22.5 TBUS 1.5/ 5-ST-3,81 GN	2707437	50
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1

PROFINET proxies

Gateways and proxies from Phoenix Contact are the intelligent solution for integrating networks into other networks.

Your advantages:

- 1:1 integration of networks or segments, thanks to proxy technology
- Easy system modernization with transparent communication over multiple bus systems
- Versatile diagnostics: thanks to topology detection and manufacturer-independent diagnostic concepts
- Fast device replacement with optional CF card as parameterization memory

Proxy for INTERBUS

Use your INTERBUS application easily in a PROFINET network: with the **FL NP PND-4TX IB**. Simply parameterize the device using your respective programming tool. Use the integrated switch in the control cabinet as an uplink to the control system or in the field for series connection.

Proxy for PROFIBUS

Integrate controllers, I/O stations, and other automation devices seamlessly into a PROFIBUS network. With the **FL NP PND-4TX PB**, you can configure and diagnose each PROFIBUS device directly, thanks to seamless integration. I/O signals of PROFIBUS devices are linked directly to program variables from the application. The PROFIBUS proxy is operated exclusively using PC Worx.

Additional features:

- Data exchange, diagnostics, and parameterization are via the PROFINET protocol
- Can be integrated and parameterized in any controller using the PROFINET functionality
- LLDP support for topology detection
- PROFINET update rates ≥ 1 ms



PROFINET INTERBUS proxy



PROFINET	
Specification	
Conformance class	
Update rate	
Software	
Ethernet	
Connection method	
Transmission speed	
INTERBUS	
Interface	
Connection method	
Number	
Number of I/O nodes	
Number of devices with parameter channel	
Transmission speed	
PROFIBUS	
Interface	
Connection method	
Number	
Transmission speed	
Number of supported devices	
Number of supported devices	
Power supply	
Supply voltage	
Supply voltage range	
Typical current consumption	
General data	
Dimensions	W / H / D
Ambient temperature (operation)	
Ambient temperature (storage/transport)	
Description	
Proxy for PROFINET	
- INTERBUS	
- INTERBUS FO	
- PROFIBUS	
Parameterization memory	

Technical data		
PROFINET-IO RT, Spec. 2.2		
B		
min. 1 ms		
Diagnostics software: DIAG+, version 2.0 or higher		
Configuration software: using the GSDML file or PC WORX version 5.0 or higher		
RJ45 socket		
10/100 Mbps		
INTERBUS (Master)		
9-pos. D-SUB socket		
1		
8192		
max. 126 (512 words)		
500 kbps / 2 Mbps (can be switched)		
-		
-		
-		
-		
max. 512 (depending on the control class and data direction)		
24 V DC		
18.5 V DC ... 30.2 V DC		
typ. 350 mA		
128 mm / 95 mm / 69 mm		
-25°C ... 60°C		
-25°C ... 70°C		
Ordering data		
Type	Order No.	Pcs./Pkt.
FL NP PND-4TX IB	2985974	1
Accessories		
CF FLASH 256MB	2988780	1



PROFINET INTERBUS fiber optic proxy

PROFINET PROFIBUS proxy
for PC Worx control systems

Technical data

PROFINET-IO RT, Spec. 2.2

B

min. 1 ms

Diagnostics software: DIAG+, version 2.0 or higher

Configuration software: using the GSDML file or
PC WORX version 5.0 or higher

RJ45 socket

10/100 Mbps

INTERBUS (Master)

F-SMA connector

1

8192

max. 126 (512 words)

500 kbps / 2 Mbps (can be switched)

-

-

-

-

max. 512 (depending on the control class and data direction)

24 V DC

18.5 V DC ... 30.2 V DC

typ. 350 mA

128 mm / 95 mm / 69 mm

-25°C ... 60°C

-25°C ... 70°C

Ordering data

Type	Order No.	Pcs./Pkt.
FL NP PND-4TX IB-LK	2985929	1

Accessories

CF FLASH 256MB	2988780	1
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Technical data

PROFINET-IO RT, Spec. 2.1

B

min. 1 ms

Diagnostics software: DIAG+, version 2.0 or higher

Configuration software PC WORX starting from Version 5.20,
Service Pack 3

RJ45 socket

10/100 Mbps

-

-

-

-

-

PROFIBUS DP V0/V1 class 2 master

9-pos. D-SUB socket

1

up to 12 Mbps

max. 125

24 V DC

18.5 V DC ... 30.2 V DC

350 mA

128 mm / 95 mm / 69 mm

-25°C ... 55°C

-25°C ... 70°C

Ordering data

Type	Order No.	Pcs./Pkt.
FL NP PND-4TX PB	2985071	1

Accessories

CF FLASH 256MB	2988780	1
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Patch panels

Ethernet patch panels enable quick and easy connection between the field cabling and control cabinet cabling. The passive termination panels are a convenient alternative to the on-site assembly of RJ45 connectors.

General features

- CAT5e
- 10/100/1000 Mbps
- Mounting on DIN rails
- Safe shield connection to ground potential
- Versions with IDC, Push-in, screw or RJ connection
- Quick and easy mounting
- Wiring space covered with front panel cover
- Tool-free shield contacting with strain relief

PP-RJ-...-F for high system availability

- Integrated surge protection in accordance with IEC 61643-21 with IEC test classification C2 for all eight cable wires
- When installed in PoE connections: shield current monitoring with visual display of undesirable cable shield currents



RJ45 to RJ45

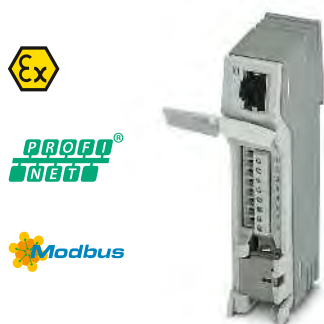


Technical data	
PP-RJ-RJ	PP-RJ-RJ-F
-	36 V DC ... 52 V DC $\pm 10\%$ (via PoE (for shield current monitoring)) 42 V DC ... 57 V DC (with UL approval)
-	≥ 30 mA
-	Yellow LED
10/100/1000 Mbps twisted pair, shielded, CAT5 or better 100 m (including patch cables) RJ45 CAT5e	
-	≤ 1.5 A (≤ 60 W (PoE+))
-	-
-	-
W / H / D	23.8 mm / 101.3 mm / 50 mm 23.8 mm / 101.3 mm / 86 mm
Degree of protection	IP20
Ambient temperature (operation)	-40°C ... 75°C
Electrical isolation	-
FE // Ethernet	

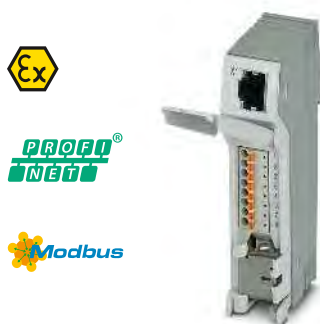
Supply	
Supply voltage range	
Shield current monitoring	
Switch-on threshold	
Local diagnostics	
General data	
Transmission speed	
Connecting cable	
Transmission distance	
Plug connection	
Current carrying capacity	
External cable diameter	
Connection cross section rigid / flexible / AWG	
Strain relief	
Dimensions	W / H / D
Degree of protection	
Ambient temperature (operation)	
Electrical isolation	

Description
Patch panel
Patch panel, with shield current monitoring and surge protection

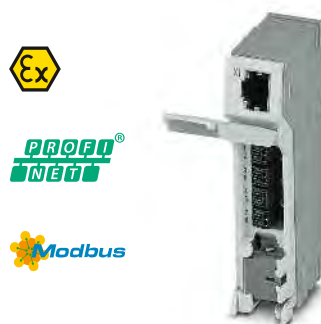
Ordering data		
Type	Order No.	Pcs./Pkt.
PP-RJ-RJ	2703015	1
PP-RJ-RJ-F	2703020	1



RJ45 to screw connection



RJ45 to Push-in connection



RJ45 to IDC connection



Technical data

PP-RJ-SC	PP-RJ-SC-F
-	36 V DC ... 52 V DC $\pm 10\%$ (via PoE) 42 V DC ... 57 V DC (with UL approval)
-	≥ 30 mA
-	Yellow LED
10/100/1000 Mbps twisted pair, shielded, CAT5 or better 100 m (including patch cables) RJ45 CAT5e	
-	≤ 1.5 A (≤ 60 W (PoE+))
-	5.5 mm ... 6.5 mm
-	0.14 - 1.5 mm ² / 0.14 - 1.5 mm ² / 28 - 16
-	Tool-free
23.8 mm / 101.3 mm / 50 mm	23.8 mm / 101.3 mm / 86 mm
-	IP20
-	-40°C ... 75°C
-	FE // Ethernet

Technical data

PP-RJ-SCC	PP-RJ-SCC-F
-	36 V DC ... 52 V DC $\pm 10\%$ (via PoE) 42 V DC ... 57 V DC (with UL approval)
-	≥ 30 mA
-	Yellow LED
10/100/1000 Mbps twisted pair, shielded, CAT5 or better 100 m (including patch cables) RJ45 CAT5e	
-	≤ 1.5 A (≤ 60 W (PoE+))
-	5.5 mm ... 6.5 mm
-	0.2 - 1.5 mm ² / 0.2 - 1.5 mm ² / 26 - 16
-	Tool-free
23.8 mm / 101.3 mm / 50 mm	23.8 mm / 101.3 mm / 86 mm
-	IP20
-	-40°C ... 75°C
-	FE // Ethernet

Technical data

PP-RJ-IDC	PP-RJ-IDC-F
-	36 V DC ... 52 V DC $\pm 10\%$ (via PoE) 42 V DC ... 57 V DC (with UL approval)
-	≥ 30 mA
-	Yellow LED
10/100/1000 Mbps twisted pair, shielded, CAT5 or better 100 m (including patch cables) RJ45 CAT5e	
-	≤ 1.5 A (≤ 60 W (PoE+))
-	5.5 mm ... 6.5 mm
-	0.14 - 0.34 mm ² / 0.14 - 0.34 mm ² / 26 - 22
-	Tool-free
23.8 mm / 101.3 mm / 50 mm	23.8 mm / 101.3 mm / 86 mm
-	IP20
-	-40°C ... 75°C
-	FE // Ethernet

Ordering data

Type	Order No.	Pcs./Pkt.
PP-RJ-SC	2703016	1
PP-RJ-SC-F	2703021	1

Ordering data

Type	Order No.	Pcs./Pkt.
PP-RJ-SCC	2703018	1
PP-RJ-SCC-F	2703022	1

Ordering data

Type	Order No.	Pcs./Pkt.
PP-RJ-IDC	2703019	1
PP-RJ-IDC-F	2703023	1

Patch panels

Ethernet patch panels enable quick and easy connection between the field cabling and control cabinet cabling. The passive termination panels are a convenient alternative to the on-site assembly of RJ45 connectors.

General features

- CAT5e
- 10/100/1000 Mbps
- Mounting on DIN rails
- Safe shield connection to ground potential

FL CAT 5 TERMINAL BOX

- Screw terminal blocks
- 4-pin assignment: 1, 2, 3, 6
- Clear marking by means of PROFINET cable colors

FL-PP-RJ45-...

- Spring connection terminal blocks
- Screw terminal blocks
- LSA connection terminal blocks
- 8-pin assignment: 1:1
- Option of shield contacting on DIN rail directly or via RC element with jumper

FL-PP-RJ45/RJ45

- Two RJ45 sockets
- 8-pin assignment: 1:1
- Version B as basic version with compact design and extended temperature range

FL-PP-RJ45-SCC/...

- Y-splitter for transmission of two individual network connections with 10/100 Mbps or phone line via a CAT cable with eight wires
- Spring connection terminal blocks
- Option of shield contacting on DIN rail directly or via RC element with jumper

PROFI[®]
NET

Modbus



1 x RJ45 to four connection terminal blocks, up to 100 Mbps

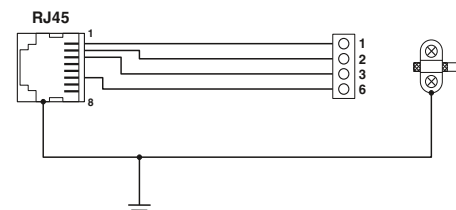
ERC

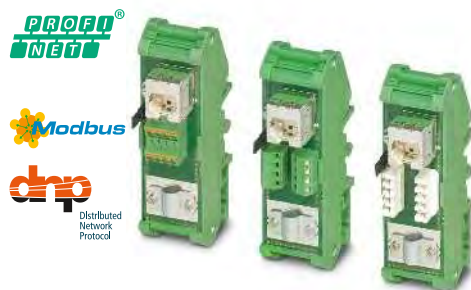
Technical data

General data	
Cable impedance	100 Ω
Transmission speed	10/100 Mbps
Connecting cable	twisted pair, shielded, CAT5 or better
Transmission distance	100 m (including patch cables)
Plug connection	RJ45 CAT5e
Insertion/withdrawal cycles	≤ 2500
External cable diameter	6 mm ... 10 mm
Connection cross section rigid / flexible / AWG	0.14 - 1.5 mm ² / 0.14 - 1 mm ² / 26 - 16
Dimensions	25 mm / 90 mm / 52 mm
Ambient temperature (operation)	-25°C ... 70°C

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Patch panel, one RJ45 socket to 4 screw connection terminal blocks (assignment 1, 2, 3, 6), CAT5, 10/100 Mbps, DIN rail mounting, IP20, shield contacting on DIN rail	FL CAT5 TERMINAL BOX	2744610	10
Patch panel, one RJ45 socket to 8 connection terminal blocks (1:1 assignment), CAT5e, 10/100/1000 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers			
- RJ45 to spring connection terminal blocks - RJ45 to screw connection terminal blocks - RJ45 to LSA connection terminal blocks (without ATEX approval)			
Patch panel, two RJ45 sockets (1:1 assignment), CAT5, 10/100/1000 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers			
Patch panel, two RJ45 sockets (1:1 assignment), extended temperature range, CAT5, 10/100 Mbps, DIN rail mounting, IP20, consistent shield, width 22.5 mm			
- without ATEX approval			
Cable sharing module , two RJ45 sockets with Ethernet assignment to 8 spring-cage connection terminal blocks, CAT5e, 10/100 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers			
- Cable outlet at the front, width 52 mm - Cable outlet at the top, width 56 mm			





1 x RJ45 to eight connection terminal blocks, up to 1000 Mbps



2x RJ45



2 x RJ45 to eight connection terminal blocks, Y-splitter

ERC
Ex: Ex

ERC
Ex: Ex

Technical data

100 Ω
10/100/1000 Mbps
twisted pair, shielded, CAT5 or better
100 m (including patch cables)
RJ45 CAT5e
≤ 2500
6 mm ... 10 mm
0.2 - 1.5 mm² / 0.2 - 1 mm² / 24 - 16
29 mm / 90 mm / 53 mm
-25°C ... 70°C

Ordering data

Type	Order No.	Pcs./Pkt.
FL-PP-RJ45-SCC	2901642	10
FL-PP-RJ45-SC	2901643	10
FL-PP-RJ45-LSA	2901645	10

Technical data

FL-PP-RJ45/RJ45 FL-PP-RJ45/RJ45-B

100 Ω 100 Ω

10/100/1000 Mbps 10/100 Mbps

twisted pair, shielded, CAT5 or better

100 m (including patch cables)

RJ45 CAT5e RJ45 CAT5

≤ 2500

29 mm / 90 mm / 53 mm 22.5 mm / 78 mm / 44 mm

-25°C ... 70°C -40°C ... 85°C

Ordering data

Type	Order No.	Pcs./Pkt.
FL-PP-RJ45/RJ45	2901646	10
FL-PP-RJ45/RJ45-B	2904933	10

Technical data

FL-PP-RJ45-SCC/SC041 FL-PP-RJ45-SCC/SC045

100 Ω

10/100 Mbps

twisted pair, shielded, CAT5 or better

100 m (including patch cables)

RJ45 CAT5e

≤ 750 ≤ 200

6 mm ... 10 mm

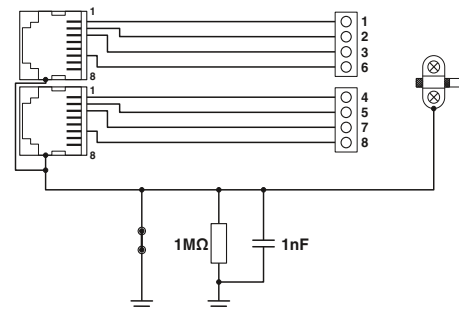
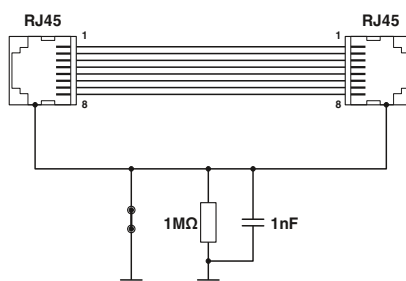
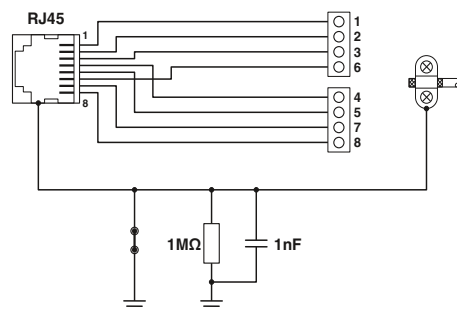
0.2 - 1.5 mm² / 0.2 - 1 mm² / 24 - 16

52 mm / 90 mm / 51 mm 56 mm / 90 mm / 51 mm

-10°C ... 50°C

Ordering data

Type	Order No.	Pcs./Pkt.
FL-PP-RJ45-SCC/SC041	2903532	1
FL-PP-RJ45-SCC/SC045	2904577	1



4 kV Ethernet ISOLATOR for electrical isolation

The **FL ISOLATOR** is used for electrical isolation in copper-based Ethernet networks.

In industrial environments, potential differences pose a constant problem with regard to interference-free data transmission.

The high-quality isolation for up to 4 kV provides reliable protection for Ethernet devices and interfaces. This results in considerably higher immunity to interference in industrial applications.

The **FL ISOLATOR 100-M12** has been specifically developed for use in the railway industry. Featuring M12 connection technology and optional wall mounting, this network isolator can be used flexibly.

Features:

- Electrical isolation of data cables and cable shielding
- Dielectric strength up to 4 kV
- Transmission speed of up to 1000 Mbps, device-specific
- No power supply required
- Protection against aggressive environmental influences, particularly harsh industrial environments, thanks to coated PCB
- Approval for railway applications (rolling stock) in accordance with EN 50155 and EN 50121
- Extended temperature range

PROFI[®]
NET

Modbus

dnp
Distributed
Network
Protocol



Transmission speeds up to 1 Gbps,
two RJ45 connections



Technical data

Ethernet interface		
Connection method		RJ45 socket, shielded
Transmission speed		10/100/1000 Mbps
Transmission distance		≤ 100 m (total length across both ports (dependent on data rate and cable used))
General data		
Dimensions	W / H / D	22.5 mm / 99 mm / 92 mm
Ambient temperature (operation)		-25°C ... 75°C
Electrical isolation		
Test voltage		Ethernet // Ethernet
Electromagnetic compatibility		4 kV AC (50 Hz, 1 min.)
Standards/regulations		Conformance with EMC Directive 2014/30/EU EN 50121 and EN 50155 (for railway applications)
Conformance/approvals		
UL, USA/Canada		508 Listed
EMC note		

Ordering data

Description	Type	Order No.	Pcs./Pkt.
Passive network isolator , for electrical isolation in Ethernet networks. For protection against potential differences of up to 4 kV. - For transmission speeds of up to 1 Gbps, connection: 2x RJ45 sockets - For transmission speeds of up to 100 Mbps, connection: 2x RJ45 sockets - For transmission speeds of up to 100 Mbps, connection: 1x RJ45 socket and COMBICON plug-in screw terminal block Passive network isolator , for electrical isolation in Ethernet networks. For protection against potential differences of up to 4 kV. - For transmission speeds of up to 100 Mbps, connection: two M12 sockets (D-coded)	FL ISOLATOR 1000-RJ/RJ	2313915	1



Transmission speeds up to 100 Mbps
Two RJ45 connections



Transmission speeds up to 100 Mbps
RJ45 and screw connection



Transmission speeds up to 100 Mbps
M12 connection



Technical data

RJ45 socket, shielded
10/100 Mbps
≤ 100 m (total length across both ports (dependent on data rate and cable used))

22.5 mm / 99 mm / 92 mm
-25°C ... 75°C

Ethernet // Ethernet
4 kV AC (50 Hz, 1 min.)
Conformance with EMC Directive 2014/30/EU
EN 50121 and EN 50155 (for railway applications)

508 Listed

Technical data

RJ45 socket, shielded
10/100 Mbps
≤ 100 m (total length across both ports (dependent on data rate and cable used))

22.5 mm / 99 mm / 92 mm
-25°C ... 75°C

Ethernet // Ethernet
4 kV AC (50 Hz, 1 min.)
Conformance with EMC Directive 2014/30/EU
EN 50121 and EN 50155 (for railway applications)

508 Listed

Technical data

M12 connector (D-coded, female)
10/100 Mbps
≤ 100 m (total length across both ports (dependent on data rate and cable used))

66 mm / 91 mm / 34 mm
-40°C ... 75°C (85°C for 10 min.; thereafter function can no longer be guaranteed – check device)

Port X1//port X2
4 kV AC (50 Hz, 1 min.)
Conformance with EMC Directive 2014/30/EU
EN 50121 and EN 50155 (for railway applications), IEC 60571,
DIN EN 50153

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Class A product, see page 527

Ordering data

Type	Order No.	Pcs./Pkt.
FL ISOLATOR 100-RJ/RJ	2313931	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL ISOLATOR 100-RJ/SC	2313928	1

Ordering data

Type	Order No.	Pcs./Pkt.
FL ISOLATOR 100-M12	2902985	1

Accessories

The reliability of networks is becoming more and more important and is a decisive factor for the future of entire companies. Independent studies show that more than 70% of network errors and crashes are due to faulty cabling infrastructure and manipulation of the connecting cables.

With the new accessories for Factoryline patch cables, the various safety requirements for automation are comprehensively met.



Dust protection for SFN switches and FL MC 1000 and 2000 media converters



Security lock for SFN switches and FL MC 1000 and 2000 media converters

Description	Ordering data			Type	Order No.	Pcs./Pkt.
	Type	Order No.	Pcs./Pkt.			
Dust protection with color marking, for SFN switch and angled patch connector						
- Black	FL DUST CVR BK	2891107	10			
- Blue	FL DUST CVR BU	2891204	10			
- Brown	FL DUST CVR BN	2891301	10			
- Yellow	FL DUST CVR YE	2891408	10			
- Gray	FL DUST CVR GY	2891505	10			
- Green	FL DUST CVR GN	2891602	10			
- Red	FL DUST CVR RD	2891709	10			
- Violet	FL DUST CVR VT	2891806	10			
- White	FL DUST CVR WH	2891903	10			
Security frame for SFN switch and patch fields						
- Green				FL PLUG GUARD GN	2891615	20
- Red				FL PLUG GUARD RD	2891712	20
- White				FL PLUG GUARD WH	2891819	20
Locking element for security frame FL PLUG GUARD...						
- Locking element				FL PORT GUARD	2891220	20
- Key				FL PLUG GUARD KEY	2891327	1
Color marking for FL CAT... patch...						
- Black						
- Blue						
- Brown						
- Yellow						
- Gray						
- Green						
- Red						
- Violet						
Security element for FL CAT... patch...						
- Security element						
- Security element, lockable						
- Key						
Dust protection cap for RJ45 socket						
- Black						





Color coding for RJ45 FL patch cables



Security element for RJ45 FL patch cables



Dust protection for RJ45 sockets

Ordering data		
Type	Order No.	Pcs./Pkt.
FL PATCH CCODE BK	2891194	20
FL PATCH CCODE BU	2891291	20
FL PATCH CCODE BN	2891495	20
FL PATCH CCODE YE	2891592	20
FL PATCH CCODE GY	2891699	20
FL PATCH CCODE GN	2891796	20
FL PATCH CCODE RD	2891893	20
FL PATCH CCODE VT	2891990	20

Ordering data		
Type	Order No.	Pcs./Pkt.
FL PATCH SAFE CLIP	2891246	20
FL PATCH GUARD	2891424	20
FL PATCH GUARD KEY	2891521	1

Ordering data		
Type	Order No.	Pcs./Pkt.
FL RJ45 PROTECT CAP	2832991	10

