

## ► General data



Hub module, mountable in rows on the DIN rail with four ports, 10Base-T and signalling contact

Order number	2831028
Type	FL HUB 10BASE-T

Barcode number	4017918811013
Unit pack	1 Piece
Customs tariff	85389091900

## ► Technical data

### Interfaces

Type of connection	RJ 45, shielded
Interface	ETHERNET
Type of connection	Four 10 BASE-T ports
Transmission speed	10 MBit/s (half-duplex)
Transmission length	100 m (Per segment)

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**Function**

Status and diagnostics displays	LEDs: UL (communications voltage), COL (collision) link and receive LED per port
No. of modules in the hub system	Max. 5 hub modules
Basic functionality	Hub/Repeater, comply with IEEE 802.3

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**Network extension parameters**

Conductor length	100 m
Cascading depth	Max. 4 hub systems cascaded (according to simplified configuration rules)

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**Supply voltage**

Supply voltage	24 V DC (Via COMBICON; max. conductor cross section 2.5 mm <sup>2</sup> )
Residual ripple	3.6 V <sub>ss</sub> (Within the permitted voltage range)
Range of supply voltages	18.5 V DC ... 30.5 V DC
Typical current consumption	190 mA (To Us)

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**General data**

Weight	140 g
Width	45 mm
Height	99 mm
Depth	112 mm
Degree of protection	IP 20
Ambient temperature (operation)	0 °C ... 55 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Perm. relative humidity (operation)	30 % ... 95 % (Non-condensing)
Electromagnetic compatibility	CE compliance with EMC directive 89/336/EEC
Emitted interference	EN 50 081-2
Immunity to interference	EN 61000-6-2

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## ► Certificates

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### **CUL**

Nominal voltage $U_N$	24 V
Nominal current $I_N$	0.18 A

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### **UL**

Nominal voltage $U_N$	24 V
Nominal current $I_N$	0.18 A

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## ▶ Drawings

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Approval logo



## ► Documentation

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### Data Sheet

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## ► Accessories

Item	Designation	Description
<b>Cable/conductor</b>		
2744830	FL CAT5 FLEX	CAT 5-S/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm <sup>2</sup> , stranded, shielded, outer sheath: 5.2 mm diameter
2744814	FL CAT5 HEAVY	CAT 5-S/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable, 2 x 2 x 0.22 mm <sup>2</sup> , solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.2 mm diameter
<b>Plug/Adapter</b>		
2744571	FL PLUG RJ45 GN/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, green for crossed cables, for assembly on site. For connections that are crossed, it is recommended that the connector set with green bend protection sleeves is used.
2744856	FL PLUG RJ45 GR/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, gray for straight cables, for assembly on site. For connections that are not crossed, it is recommended that you use the connector set with gray bend protection sleeve.
<b>Tools</b>		
2744869	FL CRIMPTOOL	Crimping pliers, for assembling the RJ 45 connectors FL PLUG RJ 45..., for assembly on site

## ► Address

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## ► General data



Management head station (Agent), with four 10 Base-T ports for the modular hub system

Order number	2831073
Type	FL HUB AGENT

Barcode number	4017918727369
Unit pack	1 Piece
Customs tariff	85389091900

## ► Technical data

### Interfaces

Type of connection	RJ 45, shielded
Interface	ETHERNET
Type of connection	Four 10 BASE-T ports
Transmission speed	10 MBit/s (half-duplex)
Transmission length	100 m (Per segment)



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## Function

Management	Management agent for the complete hub system (head station) SNMP protocol (private MIB, MIB-2, repeater MIB), integrated Web server function
Supported browsers	Netscape Communicator versions 4.5 and up or Internet Explorer versions 4.01 and up
Status and diagnostics displays	Two-digit, seven-segment display and LEDs: UL1 and UL2 (communications voltages), COL (collision) link and receive LED per port
No. of modules in the hub system	Management head station and max. 4 hub modules
Basic functionality	Hub/Repeater, comply with IEEE 802.3, TCP/IP protocol, Boot-P and TFTP-capable

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## Network extension parameters

Conductor length	100 m
Cascading depth	Max. 4 hub systems cascaded (according to simplified configuration rules)

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## Supply voltage

Supply voltage	24 V DC (Via COMBICON; max. conductor cross section 2.5 mm <sup>2</sup> )
Residual ripple	3.6 V <sub>ss</sub> (Within the permitted voltage range)
Range of supply voltages	18.5 V DC ... 30.2 V DC
Typical current consumption	230 mA (To US)

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## General data

Weight	140 g
Width	45 mm
Height	99 mm
Depth	112 mm
Degree of protection	IP 20
Ambient temperature (operation)	0 °C ... 55 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Perm. relative humidity (operation)	30 % ... 95 % (Non-condensing)
Electromagnetic compatibility	CE compliance with EMC directive 89/336/EEC
Emitted interference	EN 50 081-2
Immunity to interference	EN 61000-6-2

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## ► Certificates

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### **CUL**

Nominal voltage $U_N$	24 V
Nominal current $I_N$	0.23 A

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### **UL**

Nominal voltage $U_N$	24 V
Nominal current $I_N$	0.23 A

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## ▶ Drawings

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## ► Documentation

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### Data Sheet

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## ► Accessories

Item	Designation	Description
<b>Cable/conductor</b>		
2744830	FL CAT5 FLEX	CAT 5-S/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm <sup>2</sup> , stranded, shielded, outer sheath: 5.2 mm diameter
2744814	FL CAT5 HEAVY	CAT 5-S/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable, 2 x 2 x 0.22 mm <sup>2</sup> , solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.2 mm diameter
<b>Plug/Adapter</b>		
2744571	FL PLUG RJ45 GN/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, green for crossed cables, for assembly on site. For connections that are crossed, it is recommended that the connector set with green bend protection sleeves is used.
2744856	FL PLUG RJ45 GR/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, gray for straight cables, for assembly on site. For connections that are not crossed, it is recommended that you use the connector set with gray bend protection sleeve.
<b>Software</b>		
2831044	FL SWT	Factory Manager, multilingual, configuration and diagnostics software for ETHERNET networks in automation
<b>Tools</b>		
2744869	FL CRIMPTOOL	Crimping pliers, for assembling the RJ 45 connectors FL PLUG RJ 45..., for assembly on site

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## ► General data

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FO media module for connecting 100 BASE-FX multimode glass fibers (1300 nm), connection direction downwards

Order number	2832425
Type	FL IF 2FX SC-D

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Unit pack	1 Piece
Customs tariff	85389091900

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## ► Technical data

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### Interfaces

Type of connection	Can be plugged onto FL SWITCH MM HS or FL MXT
Interface	Ethernet: 100 BASE-FX in acc. with IEEE 802.3
Transmission speed	100 MBit/s
Transmission length	10000 m (Maximum (depends on the fiber used))

## Function

Basic functionality

Media module for modular managed switch

## General data

Ambient temperature (operation)	0 °C ... 55 °C (Non-condensing)
Ambient temperature (storage/transport)	-20 °C ... 80 °C
Perm. relative humidity (operation)	10 % ... 100 % (Non-condensing)
Housing material	PA V0, color green
Electromagnetic compatibility	CE compliance with EMC directive 89/336/EEC

## Mechanical tests

Ambient temperature (operation)	0 °C ... 55 °C (Non-condensing)
Ambient temperature (storage/transport)	-20 °C ... 80 °C
Perm. relative humidity (operation)	10 % ... 100 % (Non-condensing)
Housing material	PA V0, color green
Electromagnetic compatibility	CE compliance with EMC directive 89/336/EEC

## Conformity with EMC directives

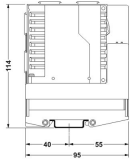
Developed in acc. with standard	IEC 61000-6.2
Test standard	IEC 61000-4-2 (ESD)
Test result	Criterion B
Test standard	IEC 61000-4-3 (immunity to radiated interference)
Test result	Criterion A
Test standard	IEC 61000-4-4 (burst)
Test result	Criterion A
Test standard	IEC 61000-4-5 (surge)
Test result	Criterion A
Test standard	IEC 61000-4-6 (immunity to conducted interference)
Test result	Criterion A
Test standard	IEC 61000-4-8 (immunity to magnetic fields)
Test result	Criterion A
Test standard	EN 55022 (emitted interference)
Test result	Criterion A



## ▸ Drawings

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### Dimensioned drawing



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## ► General data



Media module with two twisted pair ports for the modular managed switch system

Order number	2832357
Type	FL IF 2TX VS-RJ-D

Unit pack	1 Piece
Customs tariff	85389091900

## ► Technical data

### Interfaces

Type of connection	Can be plugged onto FL SWITCH MM HS or FL MXT
Interface	ETHERNET
Type of connection	2 ports 10/100 BaseT(X) autonegotiation and autocrossing
Transmission speed	10/100 Mbit/s (Connection direction downwards)
Transmission length	100 m (Per segment)

## Function

Basic functionality

Media module for modular managed switch

## General data

Degree of protection	IP 20
Ambient temperature (operation)	0 °C ... 55 °C (Non-condensing)
Ambient temperature (storage/transport)	-20 °C ... 80 °C
Perm. relative humidity (operation)	10 % ... 100 % (Non-condensing)
Housing material	PA 6.6; V0; green
Electromagnetic compatibility	CE compliance with EMC directive 89/336/EEC

## Mechanical tests

Type of test	Shock test in acc. with IEC 60068-2-27
Test result	Operation: 25 g, 11 ms duration, semi-sinusoidal shock impulse
Type of test	Shock test in acc. with IEC 60068-2-27
Test result	Storage/Transport: 50 g, 11 ms duration, semi-sinusoidal shock impulse
Type of test	Vibration resistance in acc. with IEC 60068-2-6
Test result	Operation/Storage/Transport: 5 g, 150 Hz, Criterion 3
Type of test	Free fall in acc. with IEC 60068-2-32
Test result	1 m

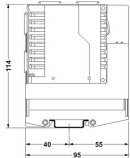
## Conformity with EMC directives

Developed in acc. with standard	IEC 61000-6.2
Test standard	IEC 61000-4-2 (ESD)
Test result	Criterion B
Test standard	IEC 61000-4-3 (immunity to radiated interference)
Test result	Criterion A
Test standard	IEC 61000-4-4 (burst)
Test result	Criterion A
Test standard	IEC 61000-4-5 (surge)
Test result	Criterion A
Test standard	IEC 61000-4-6 (immunity to conducted interference)
Test result	Criterion A
Test standard	IEC 61000-4-8 (immunity to magnetic fields)
Test result	Criterion A
Test standard	EN 55022 (emitted interference)
Test result	Criterion A

## ▶ Drawings

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### Dimensioned drawing



## ► Accessories

Item	Designation	Description
<b>Cable/conductor</b>		
2744830	FL CAT5 FLEX	CAT 5-S/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm <sup>2</sup> , stranded, shielded, outer sheath: 5.2 mm diameter
2744814	FL CAT5 HEAVY	CAT 5-S/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable, 2 x 2 x 0.22 mm <sup>2</sup> , solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.2 mm diameter
<b>General</b>		
1652295	VS-08-T-G-RJ45/IP20	RJ 45 plug with additional snap fitting (VARIOSUB)
<b>Plug/Adapter</b>		
2744571	FL PLUG RJ45 GN/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, green for crossed cables, for assembly on site. For connections that are crossed, it is recommended that the connector set with green bend protection sleeves is used.
2744856	FL PLUG RJ45 GR/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, gray for straight cables, for assembly on site. For connections that are not crossed, it is recommended that you use the connector set with gray bend protection sleeve.
<b>Tools</b>		
2744869	FL CRIMPTOOL	Crimping pliers, for assembling the RJ 45 connectors FL PLUG RJ 45..., for assembly on site

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## ► General data



Media module with two twisted-pair ports for the modular managed switch system, output towards the front

Order number	2832344
Type	FL IF 2TX VS-RJ-F

Unit pack	1 Piece
Customs tariff	85389091900

## ► Technical data

### Interfaces

Type of connection	Can be plugged onto FL SWITCH MM HS or FL MXT
Interface	ETHERNET
Type of connection	2 ports 10/100 BaseT(X) autonegotiation and autocrossing
Transmission speed	10/100 Mbit/s (Connection direction forwards)
Transmission length	100 m (Per segment)



## Function

Basic functionality

Media module for modular managed switch

## Conformity with EMC directives

Developed in acc. with standard	IEC 61000-6.2
Test standard	IEC 61000-4-2 (ESD)
Test result	Criterion B
Test standard	IEC 61000-4-3 (immunity to radiated interference)
Test result	Criterion A
Test standard	IEC 61000-4-4 (burst)
Test result	Criterion A
Test standard	IEC 61000-4-5 (surge)
Test result	Criterion A
Test standard	IEC 61000-4-6 (immunity to conducted interference)
Test result	Criterion A
Test standard	IEC 61000-4-8 (immunity to magnetic fields)
Test result	Criterion A
Test standard	EN 55022 (emitted interference)
Test result	Criterion A

## Mechanical tests

Type of test	Shock test in acc. with IEC 60068-2-27
Test result	Operation: 25 g, 11 ms duration, semi-sinusoidal shock impulse
Type of test	Shock test in acc. with IEC 60068-2-27
Test result	Storage/Transport: 50 g, 11 ms duration, semi-sinusoidal shock impulse
Type of test	Vibration resistance in acc. with IEC 60068-2-6
Test result	Operation/Storage/Transport: 5 g, 150 Hz, Criterion 3
Type of test	Free fall in acc. with IEC 60068-2-32
Test result	1 m

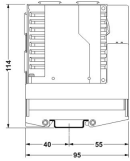
## General data

Width	31 mm
Height	73.5 mm
Depth	72.5 mm
Degree of protection	IP 20
Ambient temperature (operation)	0 °C ... 55 °C (Non-condensing)
Ambient temperature (storage/transport)	-20 °C ... 80 °C
Perm. relative humidity (operation)	10 % ... 100 % (Non-condensing)
Housing material	PA 6.6; V0; green
Electromagnetic compatibility	CE compliance with EMC directive 89/336/EEC

## ▸ Drawings

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### Dimensioned drawing



## ► Accessories

Item	Designation	Description
<b>Cable/conductor</b>		
2744830	FL CAT5 FLEX	CAT 5-S/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm <sup>2</sup> , stranded, shielded, outer sheath: 5.2 mm diameter
2744814	FL CAT5 HEAVY	CAT 5-S/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable, 2 x 2 x 0.22 mm <sup>2</sup> , solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.2 mm diameter
<b>General</b>		
1652295	VS-08-T-G-RJ45/IP20	RJ 45 plug with additional snap fitting (VARIOSUB)
<b>Plug/Adapter</b>		
2744571	FL PLUG RJ45 GN/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, green for crossed cables, for assembly on site. For connections that are crossed, it is recommended that the connector set with green bend protection sleeves is used.
2744856	FL PLUG RJ45 GR/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, gray for straight cables, for assembly on site. For connections that are not crossed, it is recommended that you use the connector set with gray bend protection sleeve.
<b>Tools</b>		
2744869	FL CRIMPTOOL	Crimping pliers, for assembling the RJ 45 connectors FL PLUG RJ 45..., for assembly on site

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## ► General data

INTERBUS ETHERNET gateway, Generation 4



Order number	2831060
Type	FL IBS SC/I-T
Barcode number	4017918818531
Unit pack	1 Piece
Customs tariff	85389091900

## ► Technical data

### Interfaces

Type of connection	RJ 45 female connector
Interface	ETHERNET
Type of connection	10/100 BASE-T(X), autonegotiation

## Function

Management	Integrated Management Agent, SNMP-protocol, integrated Web server function
Supported browsers	Netscape Communicator versions 4.5 and up or Internet Explorer versions 4.01 and up
Status and diagnostics displays	Two-digit, seven-segment display and LEDs: UL (communications voltage), COL (collision), Link, Receive, Transmit, Full Duplex, 100 Mbit/s Wirespeed, INTERBUS: RDY/RUN, BSA, FAIL, PF
Basic functionality	ETHERNET: Terminal equipment, complies with IEEE 802.3, TCP/IP protocol, BootP and TFTP-capable
Basic functionality	INTERBUS: Generation 4 master
Number of supported devices	512 Of which 256 are remote bus devices/segments
Number of process data	256 words (4096 binary inputs/outputs)
Number of devices with parameter channel	62

## Supply voltage

Supply voltage	24 V DC (Via COMBICON; max. conductor cross section 2.5 mm <sup>2</sup> )
Residual ripple	3.6 V <sub>ss</sub> (Within the permitted voltage range)
Range of supply voltages	18.5 V DC ... 30.2 V DC
Typical current consumption	200 mA (To Us)

## General data

Weight	240 g
Width	45 mm
Height	99 mm
Depth	117 mm
Degree of protection	IP 20
Ambient temperature (operation)	0 °C ... 55 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Electromagnetic compatibility	CE compliance with EMC directive 89/336/EEC
Emitted interference	EN 50 081-2
Immunity to interference	EN 61000-6-2

## ► Certificates

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### **CUL**

Nominal voltage $U_N$	24 V
Nominal current $I_N$	0.2 A

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### **UL**

Nominal voltage $U_N$	24 V
Nominal current $I_N$	0.2 A

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## ▶ Drawings

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## ► Documentation

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### Data Sheet

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## ► Accessories

Item	Designation	Description
<b>Cable/conductor</b>		
2744830	FL CAT5 FLEX	CAT 5-S/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm <sup>2</sup> , stranded, shielded, outer sheath: 5.2 mm diameter
2744814	FL CAT5 HEAVY	CAT 5-S/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable, 2 x 2 x 0.22 mm <sup>2</sup> , solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.2 mm diameter
<b>Literature</b>		
2832056	CD FL IBS SC	CD-ROM, with user documentation in PDF format, driver software and sample programs
<b>Plug/Adapter</b>		
2744571	FL PLUG RJ45 GN/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, green for crossed cables, for assembly on site. For connections that are crossed, it is recommended that the connector set with green bend protection sleeves is used.
2744856	FL PLUG RJ45 GR/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, gray for straight cables, for assembly on site. For connections that are not crossed, it is recommended that you use the connector set with gray bend protection sleeve.
2730611	PRG CAB MINI DIN	Connection cable, to connect remote field controllers to a PC (RS-232) for PC WORX, 3 m in length
<b>Software</b>		
2831044	FL SWT	Factory Manager, multilingual, configuration and diagnostics software for ETHERNET networks in automation
2721439	IBS CMD SWT G4	IBS-CMD software, for configuration, diagnostics and process data display of an INTERBUS system via PC incl. Quick Start Guide and 3.5" disks, German
2721442	IBS CMD SWT G4 E	IBS-CMD software, for configuration, diagnostics and process data display of an INTERBUS system via PC incl. Quick start guide and 3.5" disks, English
2729127	IBS OPC SERVER	The INTERBUS OPC server is used to exchange data between the distributed INTERBUS networks and the visualization systems.
<b>Tools</b>		
2744869	FL CRIMPTOOL	Crimping pliers, for assembling the RJ 45 connectors FL PLUG RJ 45..., for assembly on site



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## ► General data

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Optical fiber converter, for converting 10 BASE-T to multimode glass fiber, (850nm) rail-mountable, supply 24 V DC

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Order number	2744788
Type	FL MC 10BASE-T/FO G850

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Barcode number	4017918819460
Unit pack	1 Piece
Customs tariff	85175090000

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## ► Technical data

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### Serial interface

Data rate	10 MBit/s
Type of connection	RJ 45 female connector, shielded

### Optical interface FO

Transmit capacity, minimum	Min. -22 dBm ((50/125 µm) dynamic in link mode (average))
Transmit capacity, minimum	Min. -18.2 dBm ((62,5/125 µm) dynamic in link mode (average))
Transmit capacity, minimum	Min. -19 dBm ((50/125 µm) static)
Transmit capacity, minimum	Min. -15.2 dBm ((62,5/125 µm) static)
Transmit capacity, maximum	Max. -15.8 dBm ((50/125 µm) dynamic in link mode (average))
Transmit capacity, maximum	Max. -12 dBm ((62,5/125 µm) dynamic in link mode (average))
Transmit capacity, maximum	Max. -12.8 dBm ((50/125 µm) static)
Transmit capacity, maximum	Max. -9 dBm ((62,5/125 µm) static)
Minimum receiver sensitivity	Min. -32.50 dBm (Dynamic in link mode (average))
Minimum receiver sensitivity	Min. -29.50 dBm (Static)
Wave length	850 nm
Transmission length incl. 3 dB system reserve	Min. 3000 m (with F-G 50/125 2,5 dB/km)
Transmission length incl. 3 dB system reserve	Min. 3100 m (With F-G 50/125 2,4 dB/km)
Transmission length incl. 3 dB system reserve	Min. 3800 m (With F-G 62,5/125 3.0 d/km)
Transmission length incl. 3 dB system reserve	Min. 3000 m (with F-G 62,5/125 3,75 dB/km)
Type of connection	B-FOC

### General data

Length	127 mm
Height	99 mm
Width	22.5 mm
Ambient temperature (operation)	0 °C ... 55 °C
Electrical isolation	10 BASE-T // supply
Test voltage data interface/power supply	0.5 kV, 50 Hz, 1 min.
Electromagnetic compatibility	CE compliance with EMC directive 89/336/EEC
Emitted interference	EN 50 081-2
Immunity to interference	EN 61000-6-2
Degree of protection	IP 20
Weight	120 g
Housing material	PA V0, color green
Color	green

## ► Certificates

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### **CUL**

Nominal voltage $U_N$	24 V DC
Nominal current $I_N$	50 mA

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### **UL**

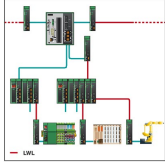
Nominal voltage $U_N$	24 V DC
Nominal current $I_N$	50 mA

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## ▸ Drawings

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### Application drawing



### Approval logo





## ► Documentation

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### Data Sheet

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## ► Accessories

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Item	Designation	Description
<b>Cable/conductor</b>		
2744830	FL CAT5 FLEX	CAT 5-S/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm <sup>2</sup> , stranded, shielded, outer sheath: 5.2 mm diameter
2744814	FL CAT5 HEAVY	CAT 5-S/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable, 2 x 2 x 0.22 mm <sup>2</sup> , solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.2 mm diameter
<b>Plug/Adapter</b>		
2744571	FL PLUG RJ45 GN/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, green for crossed cables, for assembly on site. For connections that are crossed, it is recommended that the connector set with green bend protection sleeves is used.
2744856	FL PLUG RJ45 GR/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, gray for straight cables, for assembly on site. For connections that are not crossed, it is recommended that you use the connector set with gray bend protection sleeve.
<b>Tools</b>		
2744869	FL CRIMPTOOL	Crimping pliers, for assembling the RJ 45 connectors FL PLUG RJ 45..., for assembly on site

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## ► Address

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## ► General data

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Optical fiber converter, for converting 10 BASE-T to polymer and HCS fiber, rail-mountable, supply 24 V DC

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Order number	2744513
Type	FL MC 10BASE-T/FO POF

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Barcode number	4017918190798
Unit pack	1 Piece
Customs tariff	85175090000

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## ► Technical data

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### Serial interface

Data rate	10 MBit/s
Type of connection	RJ 45 female connector, shielded

### Optical interface FO

Transmit capacity, minimum	Min. -7.7 dBm ((980/1000 $\mu$ m) dynamic in link mode (average))
Transmit capacity, minimum	Min. -18.4 dBm ((200/230 $\mu$ m) dynamic in link mode (average))
Transmit capacity, minimum	Min. -4.7 dBm ((980/1000 $\mu$ m) static)
Transmit capacity, minimum	Min. -15.4 dBm ((200/230 $\mu$ m) static)
Transmit capacity, maximum	Max. -4.6 dBm ((980/1000 $\mu$ m) dynamic in link mode (average))
Transmit capacity, maximum	Max. -9.7 dBm ((980/1000 $\mu$ m) dropped, dynamic in link mode (average))
Transmit capacity, maximum	Max. -13.1 dBm ((200/230 $\mu$ m) dynamic in link mode (average))
Transmit capacity, maximum	Max. -1.6 dBm ((980/1000 $\mu$ m) static)
Transmit capacity, maximum	Max. -5.6 dBm ((980/1000 $\mu$ m) dropped, static)
Transmit capacity, maximum	Max. -10.1 dBm ((200/230 $\mu$ m) static)
Minimum receiver sensitivity	Min. -22.80 dBm ((980/1000 $\mu$ m) dynamic in link mode (average))
Minimum receiver sensitivity	Min. -19.80 dBm ((980/1000 $\mu$ m) static)
Minimum receiver sensitivity	Min. -25.90 dBm ((200/230 $\mu$ m) dynamic in link mode (average))
Minimum receiver sensitivity	Min. -22.90 dBm ((200/230 $\mu$ m) static)
Wave length	660 nm
Transmission length incl. 3 dB system reserve	Min. 50 m (With F-K 980/1000 230 dB/km)
Transmission length incl. 3 dB system reserve	Min. 200 m (With F-S 200/230 10 dB/km)
Type of connection	F-SMA connector

### General data

Length	120 mm
Height	99 mm
Width	22.5 mm
Ambient temperature (operation)	0 °C ... 55 °C
Electrical isolation	10 BASE-T // supply
Test voltage data interface/power supply	0.5 kV, 50 Hz, 1 min.
Electromagnetic compatibility	CE compliance with EMC directive 89/336/EEC
Emitted interference	EN 50 081-2
Immunity to interference	EN 61000-6-2
Degree of protection	IP 20
Weight	120 g
Housing material	PA V0, color green
Color	green

## ► Certificates

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### **CUL**

Nominal voltage $U_N$	24 V DC
Nominal current $I_N$	50 mA

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### **UL**

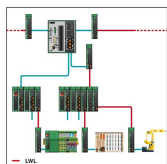
Nominal voltage $U_N$	24 V DC
Nominal current $I_N$	50 mA

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## ▸ Drawings

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### Application drawing



### Approval logo



## ► Documentation

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### Data Sheet

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## ► Accessories

Item	Designation	Description
<b>Cable/conductor</b>		
2744830	FL CAT5 FLEX	CAT 5-S/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm <sup>2</sup> , stranded, shielded, outer sheath: 5.2 mm diameter
2744814	FL CAT5 HEAVY	CAT 5-S/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable, 2 x 2 x 0.22 mm <sup>2</sup> , solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.2 mm diameter
<b>Plug/Adapter</b>		
2744571	FL PLUG RJ45 GN/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, green for crossed cables, for assembly on site. For connections that are crossed, it is recommended that the connector set with green bend protection sleeves is used.
2744856	FL PLUG RJ45 GR/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, gray for straight cables, for assembly on site. For connections that are not crossed, it is recommended that you use the connector set with gray bend protection sleeve.
<b>Tools</b>		
2744869	FL CRIMPTOOL	Crimping pliers, for assembling the RJ 45 connectors FL PLUG RJ 45..., for assembly on site

## ► Address

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## ► General data



Optical fiber converter, for converting 100 BASE-T to multimode glass fiber (1300 nm) rail-mountable, supply 24 V DC (conversion to single mode on request)

Order number	2744762
Type	FL MC 100BASE-T/FO G1300

Barcode number	4017918851118
Unit pack	1 Piece
Customs tariff	85175090000

## ► Technical data

### Serial interface

Data rate	100 MBit/s
Type of connection	RJ 45 female connector, shielded

### Optical interface FO

Transmit capacity, minimum	Min. -23.5 dBm ((50/125 µm) dynamic in link mode (average))
Transmit capacity, minimum	Min. -20 dBm ((62,5/125 µm) dynamic in link mode (average))
Transmit capacity, minimum	Min. -20.5 dBm ((50/125 µm) static)
Transmit capacity, minimum	Min. -17 dBm ((62,5/125 µm) static)
Transmit capacity, maximum	Max. -14 dBm ((50/125 µm) dynamic in link mode (average))
Transmit capacity, maximum	Max. -14 dBm ((62,5/125 µm) dynamic in link mode (average))
Transmit capacity, maximum	Max. -11 dBm ((50/125 µm) static)
Transmit capacity, maximum	Max. -11 dBm ((62,5/125 µm) static)
Minimum receiver sensitivity	Min. -31 dBm (Dynamic in link mode (average))
Minimum receiver sensitivity	Min. -28 dBm (Static)
Wave length	1300 nm
Transmission length incl. 3 dB system reserve	Min. 6400 m (with F-G 50/125 0,7 dB/km F 1200)
Transmission length incl. 3 dB system reserve	Min. 2800 m (with F-G 50/125 1,6 dB/km F 800)
Transmission length incl. 3 dB system reserve	Min. 10000 m (with F-G 62,5/125 0,7 dB/km F 1000)
Transmission length incl. 3 dB system reserve	Min. 3000 m (with F-G 62,5/125 2,6 dB/km F 1000)
Type of connection	SC

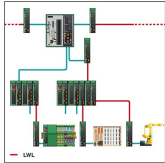
### General data

Length	114.5 mm
Height	99 mm
Width	22.5 mm
Ambient temperature (operation)	0 °C ... 55 °C
Electrical isolation	100 BASE-T // supply
Test voltage data interface/power supply	0.5 kV, 50 Hz, 1 min.
Electromagnetic compatibility	CE compliance with EMC directive 89/336/EEC
Emitted interference	EN 50 081-2
Immunity to interference	EN 61000-6-2
Degree of protection	IP 20
Weight	120 g
Housing material	PA V0, color green
Color	green

## ▸ Drawings

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### Application drawing



## ► Documentation

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### Data Sheet

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## ► Accessories

Item	Designation	Description
<b>Cable/conductor</b>		
2744830	FL CAT5 FLEX	CAT 5-S/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm <sup>2</sup> , stranded, shielded, outer sheath: 5.2 mm diameter
2744814	FL CAT5 HEAVY	CAT 5-S/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable, 2 x 2 x 0.22 mm <sup>2</sup> , solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.2 mm diameter
<b>Plug/Adapter</b>		
2744571	FL PLUG RJ45 GN/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, green for crossed cables, for assembly on site. For connections that are crossed, it is recommended that the connector set with green bend protection sleeves is used.
2744856	FL PLUG RJ45 GR/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, gray for straight cables, for assembly on site. For connections that are not crossed, it is recommended that you use the connector set with gray bend protection sleeve.
<b>Tools</b>		
2744869	FL CRIMPTOOL	Crimping pliers, for assembling the RJ 45 connectors FL PLUG RJ 45..., for assembly on site

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## ► General data



Optical fiber converter, for converting 100 BASE-T to single mode glass fiber, (1300 nm) rail-mountable, supply 24 V DC

Order number	2744034
Type	FL MC 100BASE-T/FO G1300 SM
Barcode number	4017918900496
Unit pack	1 Piece
Customs tariff	8536901000

## ► Technical data

### Serial interface

Data rate	100 MBit/s
Type of connection	RJ 45 female connector, shielded

### Optical interface FO

Transmit capacity, minimum	Min. -15 dBm ((9/125 µm) dynamic in link mode (average))
Transmit capacity, minimum	Min. -12 dBm ((9/125 µm) static)
Transmit capacity, maximum	Max. -8 dBm ((9/125 µm) dynamic in link mode (average))
Transmit capacity, maximum	Max. -5 dBm ((9/125 µm) static)
Minimum receiver sensitivity	Min. -31 dBm ((9/125 µm) dynamic in link mode (average))
Minimum receiver sensitivity	Min. -28 dBm ((9/125 µm) static)
Wave length	1300 nm
Transmission length incl. 3 dB system reserve	Min. 36000 m (with F-G 9/125 0,36dB/km)
Transmission length incl. 3 dB system reserve	Min. 32000 m (with F-G 9/125 0,4 dB/km)
Transmission length incl. 3 dB system reserve	Min. 26000 m (with F-G 9/125 0,5 dB/km)
Type of connection	SC

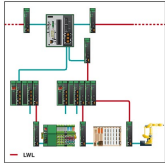
### General data

Length	114.5 mm
Height	99 mm
Width	22.5 mm
Ambient temperature (operation)	0 °C ... 55 °C
Electrical isolation	100 BASE-T // supply
Test voltage data interface/power supply	0.5 kV, 50 Hz, 1 min.
Electromagnetic compatibility	CE compliance with EMC directive 89/336/EEC
Emitted interference	EN 50 081-2
Immunity to interference	EN 61000-6-2
Degree of protection	IP 20
Weight	120 g
Housing material	PA V0, color green
Color	green

## ▸ Drawings

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### Application drawing



## ► Documentation

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### Data Sheet

5107539.pdf

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## ► Accessories

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Item	Designation	Description
<b>Cable/conductor</b>		
2744830	FL CAT5 FLEX	CAT 5-S/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm <sup>2</sup> , stranded, shielded, outer sheath: 5.2 mm diameter
2744814	FL CAT5 HEAVY	CAT 5-S/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable, 2 x 2 x 0.22 mm <sup>2</sup> , solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.2 mm diameter
<b>Plug/Adapter</b>		
2744571	FL PLUG RJ45 GN/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, green for crossed cables, for assembly on site. For connections that are crossed, it is recommended that the connector set with green bend protection sleeves is used.
2744856	FL PLUG RJ45 GR/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, gray for straight cables, for assembly on site. For connections that are not crossed, it is recommended that you use the connector set with gray bend protection sleeve.
<b>Tools</b>		
2744869	FL CRIMPTOOL	Crimping pliers, for assembling the RJ 45 connectors FL PLUG RJ 45..., for assembly on site

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## ► General data

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Ethernet Switch, 4 TP-RJ 45 ports 10/100 Mbit/s and 1 FO port, 100 Mbit/s full duplex in SC-D format, automatic detection of data transmission rate of 10 or 100 Mbit/s (RJ 45), autocrossing function,

Order number	2832810
Type	FL SWITCH 4TX/FX

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Barcode number	4017918911744
Unit pack	1 Piece
Customs tariff	85389091900

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## ► Technical data

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### Interfaces

Type of connection	RJ 45, shielded or SC-D
Interface	ETHERNET (RJ45)
Type of connection	4 ports 10/100 BaseT(X), autonegotiation and autocrossing
Transmission speed	10/100 Mbit/s (RJ45)
Transmission length	RJ45 100 m (Per segment)
Signal LEDs	Data receive, link status

### Function

Status and diagnostics displays	LEDs: US1, US2 (redundant voltage supply), link and activity per port
Basic functionality	Unmanaged switch/full duplex, complies with IEEE 802.3, store and forward switching mode

### Network extension parameters

Conductor length	100 m
Cascading depth	Network, line and star structure: Any

### Supply voltage

Supply voltage	24 V DC
Residual ripple	3.6 V <sub>ss</sub> (Within the permitted voltage range)
Range of supply voltages	18.5 V DC ... 30.2 V DC
Typical current consumption	180 mA (To US)

### General data

Weight	225 g
Width	45 mm
Height	99 mm
Depth	112 mm
Degree of protection	IP 20
Ambient temperature (operation)	0 °C ... 55 °C (Non-condensing)
Ambient temperature (storage/transport)	-20 °C ... 70 °C ( )
Perm. relative humidity (operation)	30 % ... 95 % (Non-condensing)
Housing material	PA 6.6; V0; green
Electromagnetic compatibility	CE compliance with EMC directive 89/336/EEC



### Mechanical tests

Weight	225 g
Type of test	Shock test in acc. with IEC 60068-2-27
Width	45 mm
Test result	Operation: 25 g, 11 ms duration, semi-sinusoidal shock impulse
Height	99 mm
Type of test	Shock test in acc. with IEC 60068-2-27
Depth	112 mm
Test result	Storage/Transport: 50 g, 11 ms duration, semi-sinusoidal shock impulse
Degree of protection	IP 20
Type of test	Vibration resistance in acc. with IEC 60068-2-6
Ambient temperature (operation)	0 °C ... 55 °C (Non-condensing)
Test result	Operation/Storage/Transport: 5 g, 150 Hz, Criterion 3
Ambient temperature (storage/transport)	-20 °C ... 70 °C ( )
Type of test	Free fall in acc. with IEC 60068-2-32
Perm. relative humidity (operation)	30 % ... 95 % (Non-condensing)
Test result	1 m
Housing material	PA 6.6; V0; green
Electromagnetic compatibility	CE compliance with EMC directive 89/336/EEC

### Conformity with EMC directives

Developed in acc. with standard	IEC 61000-6.2
Test standard	IEC 61000-4-2 (ESD)
Test result	Criterion B
Test standard	IEC 61000-4-3 (immunity to radiated interference)
Test result	Criterion A
Test standard	IEC 61000-4-4 (burst)
Test result	Criterion A
Test standard	IEC 61000-4-5 (surge)
Test result	Criterion B
Test standard	IEC 61000-4-6 (immunity to conducted interference)
Test result	Criterion A
Test standard	IEC 61000-4-8 (immunity to magnetic fields)
Test result	Criterion A
Test standard	EN 55022 (emitted interference)
Test result	Criterion A

## ► Documentation

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### Data Sheet

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## ► Accessories

Item	Designation	Description
<b>Cable/conductor</b>		
2744830	FL CAT5 FLEX	CAT 5-S/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm <sup>2</sup> , stranded, shielded, outer sheath: 5.2 mm diameter
2744814	FL CAT5 HEAVY	CAT 5-S/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable, 2 x 2 x 0.22 mm <sup>2</sup> , solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.2 mm diameter
<b>General</b>		
2744762	FL MC 100BASE-T/FO G1300	Optical fiber converter, for converting 100 BASE-T to multimode glass fiber (1300 nm) rail-mountable, supply 24 V DC (conversion to single mode on request)
2744034	FL MC 100BASE-T/FO G1300 SM	Optical fiber converter, for converting 100 BASE-T to single mode glass fiber, (1300 nm) rail-mountable, supply 24 V DC
<b>Plug/Adapter</b>		
2744571	FL PLUG RJ45 GN/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, green for crossed cables, for assembly on site. For connections that are crossed, it is recommended that the connector set with green bend protection sleeves is used.
2744856	FL PLUG RJ45 GR/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, gray for straight cables, for assembly on site. For connections that are not crossed, it is recommended that you use the connector set with gray bend protection sleeve.
<b>Tools</b>		
2744869	FL CRIMPTOOL	Crimping pliers, for assembling the RJ 45 connectors FL PLUG RJ 45..., for assembly on site

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## ► General data

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Ethernet Switch, 5 front Ethernet ports in RJ 45 format, automatic detection of data transmission rate of 10 or 100 Mbit/s, coupling network segments with different transmission rates, autocrossing function, DIN rail mountable

Order number	2832085
Type	FL SWITCH 5TX

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Barcode number	4017918877156
Unit pack	1 Piece
Customs tariff	85389091900

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## ► Technical data

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### Interfaces

Type of connection	RJ 45, shielded
Interface	ETHERNET
Type of connection	5 ports 10 /100 BaseT(X) autonegotiation and autocrossing
Transmission speed	10/100 Mbit/s
Transmission length	100 m (Per segment)
Signal LEDs	Data receive, link status

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### Function

Status and diagnostics displays	LEDs: US1, US2 (redundant voltage supply), link and activity per port
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### Network extension parameters

Conductor length	100 m
Cascading depth	Network, line and star structure: Any

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### Supply voltage

Supply voltage	24 V DC
Residual ripple	3.6 V <sub>ss</sub> (Within the permitted voltage range)
Range of supply voltages	18.5 V DC ... 30.2 V DC
Typical current consumption	180 mA (To US)

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### General data

Weight	225 g
Width	45 mm
Height	99 mm
Depth	112 mm
Degree of protection	IP 20
Ambient temperature (operation)	0 °C ... 55 °C (Non-condensing)
Ambient temperature (storage/transport)	-20 °C ... 70 °C ( )
Perm. relative humidity (operation)	30 % ... 95 % (Non-condensing)
Housing material	PA 6.6; V0; green
Electromagnetic compatibility	CE compliance with EMC directive 89/336/EEC

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## ► Certificates

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### CUL

Nominal voltage $U_N$	24 V
Nominal current $I_N$	0.18 A

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### UL

Nominal voltage $U_N$	24 V
Nominal current $I_N$	0.18 A

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## ▶ Drawings

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Approval logo





## ► Documentation

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### Data Sheet

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## ► Accessories

Item	Designation	Description
<b>Cable/conductor</b>		
2744830	FL CAT5 FLEX	CAT 5-S/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm <sup>2</sup> , stranded, shielded, outer sheath: 5.2 mm diameter
2744814	FL CAT5 HEAVY	CAT 5-S/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable, 2 x 2 x 0.22 mm <sup>2</sup> , solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.2 mm diameter
<b>General</b>		
2744788	FL MC 10BASE-T/FO G850	Optical fiber converter, for converting 10 BASE-T to multimode glass fiber, (850nm) rail-mountable, supply 24 V DC
2744513	FL MC 10BASE-T/FO POF	Optical fiber converter, for converting 10 BASE-T to polymer and HCS fiber, rail-mountable, supply 24 V DC
<b>Plug/Adapter</b>		
2744571	FL PLUG RJ45 GN/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, green for crossed cables, for assembly on site. For connections that are crossed, it is recommended that the connector set with green bend protection sleeves is used.
2744856	FL PLUG RJ45 GR/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, gray for straight cables, for assembly on site. For connections that are not crossed, it is recommended that you use the connector set with gray bend protection sleeve.
<b>Tools</b>		
2744869	FL CRIMPTOOL	Crimping pliers, for assembling the RJ 45 connectors FL PLUG RJ 45..., for assembly on site

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► **General data**



Ethernet switch with redundancy option, glass fiber backbone, uplinks: 2 10/100 BASE-FX ports, full duplex SC connector, downlinks: 5 10/100 BASE-T(X) ports, RJ 45 sockets, integrated Web server function, integrated management agent, DIN rail mountable

Order number	2831086
Type	FL SWITCH FX/FX

Barcode number	4017918599355
Unit pack	1 Piece
Customs tariff	85389091900

► **Technical data**

**Interfaces**

Connection system	8-pos. RJ 45 female connector, shielded, FO via SC female connector
Interface	ETHERNET
Type of connection	7 ports, 5 of which are 10/100 BASE-T(X) autonegotiation
Transmission length	111 mm

## Function

Management	Integrated Management Agent, SNMP protocol (private MIB, MIB-2, RMON MIB, Bridge MIB), integrated Web server function
Supported browsers	Netscape Communicator from Version 4.5 necessary or Internet Explorer from Version 4.01, Plugin "Java Runtime Environment" Version 1.2
Status and diagnostics displays	LEDs: UL1 and UL2 (redundant power supply voltage), STANDBY, RM (redundancy manager) link and receive LED per port
Redundancy	Integrated redundancy manager for ETHERNET ring (quick media redundancy: 500 ms for 50 switches), redundant connection of end-of-line units and segments to two switches (active and stand-by)
Basic functionality	Switch, store and forward-switching mode, 2 priority classes and basic filtering in acc. with IEEE 802.1 D, TCP/IP protocol, BootP and TFTP-capable, connection mirroring

## Network extension parameters

Conductor length	100 m
Cascading depth	Line and star structure: Any, redundant ring: 50 (with reconfiguration time <500 ms)

## Supply voltage

Supply voltage	24 V DC (Redundant via COMBICON; max. conductor cross section 2.5 mm <sup>2</sup> )
Residual ripple	3.6 V <sub>ss</sub> (Within the permitted voltage range)
Range of supply voltages	18.5 V DC ... 30.2 V DC
Max. current consumption	800 mA (To Us)

## General data

Weight	850 g
Width	110 mm
Height	131 mm
Depth	111 mm
Degree of protection	IP 20
Ambient temperature (operation)	0 °C ... 55 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Electromagnetic compatibility	CE compliance with EMC directive 89/336/EEC
Emitted interference	EN 50 081-2
Immunity to interference	EN 61000-6-2

## ► Documentation

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### Data Sheet

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## ► Accessories

Item	Designation	Description
<b>Cable/conductor</b>		
2744830	FL CAT5 FLEX	CAT 5-S/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm <sup>2</sup> , stranded, shielded, outer sheath: 5.2 mm diameter
2744814	FL CAT5 HEAVY	CAT 5-S/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable, 2 x 2 x 0.22 mm <sup>2</sup> , solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.2 mm diameter
2832043	FL SWITCH CAB	Cable for programming 9-pos. D-SUB/RJ11
<b>Plug/Adapter</b>		
2744571	FL PLUG RJ45 GN/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, green for crossed cables, for assembly on site. For connections that are crossed, it is recommended that the connector set with green bend protection sleeves is used.
2744856	FL PLUG RJ45 GR/2	RJ 45 connector, shielded, with bend protection sleeve, 2 pieces, gray for straight cables, for assembly on site. For connections that are not crossed, it is recommended that you use the connector set with gray bend protection sleeve.
<b>Software</b>		
2831044	FL SWT	Factory Manager, multilingual, configuration and diagnostics software for ETHERNET networks in automation
<b>Tools</b>		
2744869	FL CRIMPTOOL	Crimping pliers, for assembling the RJ 45 connectors FL PLUG RJ 45..., for assembly on site

## ► Address

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Phoenix Contact GmbH & Co. KG  
Flachsmarktstr. 8  
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► **General data**



Modular switch system, head station, can be expanded to 24 Ethernet ports

Order number	2832328
Type	FL SWITCH MM HS

Unit pack	1 Piece
Customs tariff	85389091900

► **Technical data**

**Interfaces**

Type of connection	10/100 BASE-T(X), autonegotiation
Type of connection	100 BASE-FX
Interface	ETHERNET
Type of connection	8 ports (expandable to max. 24 ports) via FL IF (interface) modules
Transmission speed	10/100 Mbit/s
Transmission length	100 m (Per segment)
Signal LEDs	Data receive, link status

**Function**

Management	Integrated Management Agent, SNMP protocol (private MIB, MIB-2, RMON MIB, Bridge MIB), integrated Web server function
Supported browsers	Netscape Communicator versions 4.5 and up or Internet Explorer versions 5.5 and up
Status and diagnostics displays	LEDs: US1, US2 (redundant voltage supply), link and activity per port
Basic functionality	Modular managed Ethernet switch

### Network extension parameters

Conductor length	100 m
Cascading depth	Network, line and star structure: Any

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### Supply voltage

Supply voltage	24 V DC
Residual ripple	3.6 V <sub>ss</sub> (Within the permitted voltage range)
Range of supply voltages	18.5 V DC ... 30.2 V DC
Typical current consumption	0 mA (300 mA to 2500 mA with 24 V DC (depending on the configuration, number of extension modules and the type of interface modules))
Current consumption	typ. 300 mA ... 2500 mA Depends on the configuration/ extensions/ interfaces

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### Mechanical tests

Type of test	Shock test in acc. with IEC 60068-2-27
Test result	Operation: 25 g, 11 ms duration, semi-sinusoidal shock impulse
Type of test	Shock test in acc. with IEC 60068-2-27
Test result	Storage/Transport: 50 g, 11 ms duration, semi-sinusoidal shock impulse
Type of test	Vibration resistance in acc. with IEC 60068-2-6
Test result	Operation: 5g, 150 Hz, criterion A
Type of test	Free fall in acc. with IEC 60068-2-32
Test result	1 m
Type of test	Vibration resistance in acc. with IEC 60068-2-6
Test result	Storage/transport: 5g, 150 Hz, criterion C

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### Conformity with EMC directives

Developed in acc. with standard	IEC 61000-6.2
Test standard	IEC 61000-4-2 (ESD)
Test result	Criterion B
Test standard	IEC 61000-4-3 (immunity to radiated interference)
Test result	Criterion A
Test standard	IEC 61000-4-4 (burst)
Test result	Criterion A
Test standard	IEC 61000-4-5 (surge)
Test result	Criterion A
Test standard	IEC 61000-4-6 (immunity to conducted interference)
Test result	Criterion A
Test standard	EN 55022 (emitted interference)
Test result	Class A

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**General data**

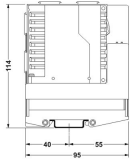
Weight	1350 g
Width	214 mm
Height	95 mm
Depth	115 mm
Degree of protection	IP 20
Ambient temperature (operation)	0 °C ... 55 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Perm. relative humidity (operation)	10 % ... 95 % (Non-condensing)
Housing material	Zinc die-cast, surface bronzed and nickel-plated
Electromagnetic compatibility	CE compliance with EMC directive 89/336/EEC

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## ▸ Drawings

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### Dimensioned drawing



## ► Accessories

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Item	Designation	Description
<b>General</b>		
2832425	FL IF 2FX SC-D	FO media module for connecting 100 BASE-FX multimode glass fibers (1300 nm), connection direction downwards
2832357	FL IF 2TX VS-RJ-D	Media module with two twisted pair ports for the modular managed switch system
2832344	FL IF 2TX VS-RJ-F	Media module with two twisted-pair ports for the modular managed switch system, output towards the front

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## ► General data

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Order number	2832030
Type	FL SWITCH TX/TX

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Barcode number	4017918599348
Unit pack	1 Piece
Customs tariff	85389091900

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## ► Technical data

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### Interfaces

Connection system	8-pos. RJ 45 female connector, shielded, FO via SC female connector
Interface	ETHERNET
Type of connection	7 ports, 5 of which are 10/100 BASE-T(X) autonegotiation

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## Function

Management	Integrated Management Agent, SNMP protocol (private MIB, MIB-2, RMON MIB, Bridge MIB), integrated Web server function
Supported browsers	Netscape Communicator from Version 4.5 necessary or Internet Explorer from Version 4.01, Plugin &quot;Java Runtime Environment&quot; Version 1.2
Status and diagnostics displays	LEDs: UL1 and UL2 (redundant power supply voltage), STANDBY, RM (redundancy manager) link and receive LED per port
Redundancy	Integrated redundancy manager for ETHERNET ring (quick media redundancy: 500 ms for 50 switches), redundant connection of end-of-line units and segments to two switches (active and stand-by)
Basic functionality	Switch, store and forward-switching mode, 2 priority classes and basic filtering in acc. with IEEE 802.1 D, TCP/IP protocol, BootP and TFTP-capable, connection mirroring

## Network extension parameters

Conductor length	100 m
Cascading depth	Line and star structure: Any, redundant ring: 50 (with reconfiguration time <500 ms)

## Supply voltage

Supply voltage	24 V DC (Redundant via COMBICON; max. conductor cross section 2.5 mm <sup>2</sup> )
Residual ripple	3.6 V <sub>ss</sub> (Within the permitted voltage range)
Range of supply voltages	18.5 V DC ... 30.2 V DC
Max. current consumption	800 mA (To Us)

## General data

Weight	850 g
Width	110 mm
Height	131 mm
Depth	111 mm
Degree of protection	IP 20
Ambient temperature (operation)	0 °C ... 55 °C
Ambient temperature (storage/transport)	-20 °C ... 70 °C
Electromagnetic compatibility	CE compliance with EMC directive 89/336/EEC
Emitted interference	EN 50 081-2
Immunity to interference	EN 61000-6-2



## ► Documentation

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### Data Sheet

6146a\_gb.pdf

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## ► Accessories

Item	Designation	Description
<b>Cable/conductor</b>		
2744830	FL CAT5 FLEX	CAT 5-S/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm <sup>2</sup> , stranded, shielded, outer sheath: 5.2 mm diameter
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<b>Plug/Adapter</b>		
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<b>Software</b>		
2831044	FL SWT	Factory Manager, multilingual, configuration and diagnostics software for ETHERNET networks in automation
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2744869	FL CRIMPTOOL	Crimping pliers, for assembling the RJ 45 connectors FL PLUG RJ 45..., for assembly on site

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