

PRODUCT PORTFOLIO



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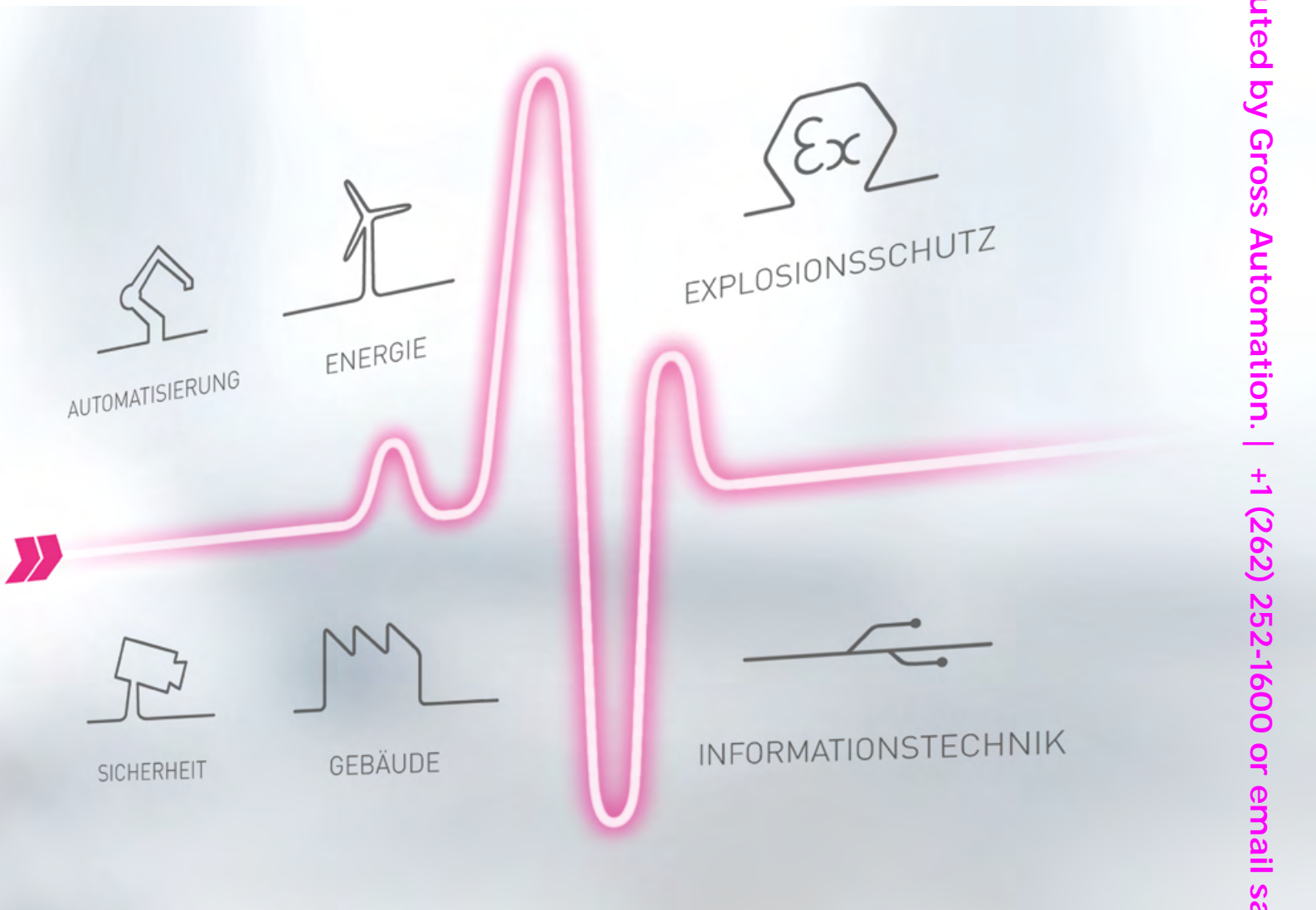
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- ROUTER & ETHERNET EXTENDER
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INDUSTRIAL NETWORKING





INTELLIGENT SOLUTIONS – engineered by eks



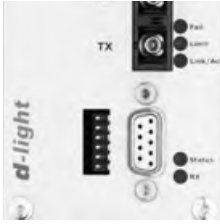
We are experts in industrial networking and we develop and produce high-performance electronic systems and modular communication systems for the industrial data transmission via fiber optics. Apart from that we offer customized engineering services on the „Best in class principle“.

As an independent, owner-managed family company, we have been standing for important customer needs such as performance, efficiency and security of investment for more than 80 years. Doing so we trust in our long-term expertise. At our headquarter in Germany we have been producing fiber optic systems and solutions since 1986. Because of that, we can call ourselves pioneers of modern communication.

Our innovative products are used in a wide variety of industries. We deliver economic total solutions from one source - from active and passive systems via the component accessories to tailor-made services. Last but not least, our clear price and discount structure shows transparency.

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INTERFACE



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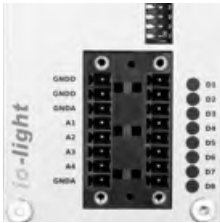
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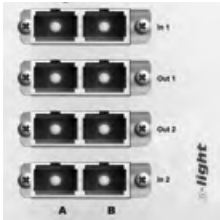
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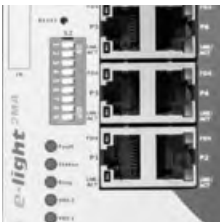


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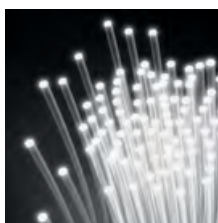


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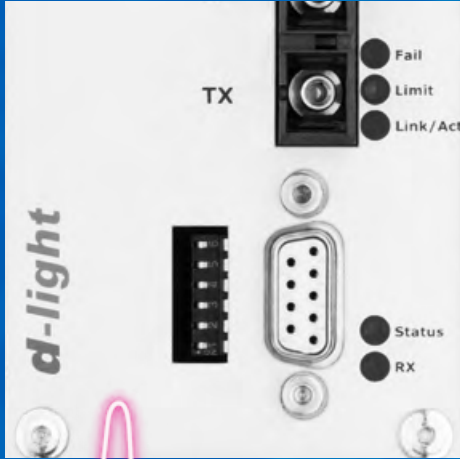
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We produce high performance fiber optics systems for all common fieldbuses and interfaces such as PROFIBUS, MODBUS, MODNET, CAN, RS232, RS422, RS485, TTY and many more.

The systems have industrial features such as wide temperature ranges or approvals and all have a robust stainless steel housing. They support all common fiber types such as POF, HCS, Multimode and Singlemode and a great variety of optical connectors.

INTERFACE

THE COMMON APPLICATIONS ARE NETWORKS IN THE AREAS:

- Automation, e.g. manufacturing, buildings and tunnels
- Security applications such as SCADA, ELA and control applications

THE PREDOMINANT BRANCHES:

- Industrial automation
- Security
- Power engineering
- Building technology

YOUR ADVANTAGES AND BENEFITS:

- Industrial and robust design
- Suitable for ring, star, line (drop) and tree structures
- High planning reliability through uniform housing concept
- High number of variants and vertical range of manufacture
- Special Solutions

PRODUCT MATRIX INTERFACE

	General		Application area		Power supply		Temperature range		Topology			Physics				Protocol				Other		Technical approvals		Catalog
	Product name	DIN rail	12 - 30 (24 - 60) VDC	Wide temperature range -40 °C / +70 °C	Point to point	Drop (bus)	Ring	RS485	RS232	RS422	CAN-Bus	TTY	PROFIBUS	MODBUS	MODBUS PLUS	CAN	IP protection class	Dimensions in mm (W x H x D)	CE	Page				
Transparent																								
RS485-FO-system	DL-485 DL-485-2X	●	●	●	●	●	●						●				IP 40	60 x 120 x 110	●	09				
RS485-4-wire FO-system	DL-485-4W DL-485-4W2X	●	●	●	●	●	●										IP 40	60 x 120 x 110	●	09				
CAN-Bus FO-system	DL-CAN-FV DL-CAN-FV2X DL-CAN-R	●	●	●	●	●				●					●		IP 20	60 x 120 x 110	●	11				
TTY-FO-system	DL-TTY	●	●	●	●						●						IP 20	60 x 120 x 110	●	11				
RS232-FO-system	DL-232 DL-232-2X DL-232-R	●	●	●	●	●		●									IP 20	60 x 120 x 110	●	12				
	DL-232-MUX	●	●	●	●			4x									IP 20	60 x 120 x 110	●	12				
RS422-FO-system	DL-422 DL-422-2X	●	●	●	●	●			●								IP 20	60 x 120 x 110	●	13				
Protocol																								
PROFIBUS FO-system	DL-485-PB DL-485-PB2X DL(S)-485-PBR	●	●	●	●	●	●	●				●					IP 40	60 (40) x 120 x 110	●	09				
MODBUS FO-system	DL-485-MB DL-485-MBR	●	●	●	●	●	●	●					●				IP 40	60 x 120 x 110	●	10				
MODBUS PLUS FO-system	DL-485-MBP DL-485-MBP2X DL-485-MBPR	●	●	●	●	●	●	●						●			IP 40	60 x 120 x 110	●	10				



LEGEND

GENERAL



CE label



RoHS label



Wide temperature range



5 years warranty



Made in Germany

PRODUCT SPECIFIC



RS485



RS485 PROFIBUS



RS485 MODBUS PLUS



RS485 MODBUS



RS422



RS232



RS232 Multiplexer



CAN



TTY



Multimode/Singlemode converter



Ring redundancy



PROFIBUS & PROFINET certified



Product	DL-485/DL-485-2X/DL-485-4W/DL-485-4W2X	DL-485-PB / DL-485-PB2X / DL(S)-485-PBR
Description	RS485-F0-system - protocol transparent	PROFIBUS-F0-system - standard/redundant
Article no.	010006 xxx	010006 xxx
Port type and amount	1 x or 2 x optical: ST, SC, E2000 or SC/BIDI, 1 x electrical: Sub-D 9 pin, female	
Electrical interface		
Signal type	RS485 2-wire or 4-wire (4W) transmission	RS485 2-wire transmission for PROFIBUS-DP or PROFIBUS-FMS
Data rate	1200 Bit/s – 3 MBit/s	Max. 12 MBit/s
Transmission type	Full duplex (DL-485-4W), half duplex (all others)	
Terminating resistor	Switchable: Pull-Up (R_{PU}), Pull-Down (R_{PD}), terminating resistor (R_W)	
Signal LEDs/interfaces		
Status LEDs	Failure (red)/Data (green)/Power (green), Fiberview (red, yellow, green)	
Failure relay	25 VDC (1 A) / 60 VDC (0.3 A) (DL-485-4W: only optional)	
Connector	9 pin SUB-D female, 2 x 4 pin and 1 x 6 pin terminal	
Fiber type / range / budget		
POF 980/1000 μm (180 dB/km)	0 m – 50 m, optical budget 12 dB with 650 nm	
HCS 200/230 μm (8 dB/km)	0 m – 200 m, optical budget 12 dB with 850 nm	
Multimode 62.5 (50)/125 μm (2 dB/km)	0 m – 5 km, optical budget 13 dB with 1300 nm (BIDI 1310 nm/1550 nm)	
Singlemode 9/125 μm (0.4 dB/km)	0 m – 30 km, optical budget 17 dB with 1310 nm (BIDI 1310 nm/1550 nm) (other distances on request)	
Supply		
Power supply	12 – 30 VDC or 24 – 60 VDC	
Power consumption at 24 VDC	Max. 150 mA	
Redundancy		
Redundancy functions	–	Optical redundant ring structure (DL-485-PBR)
Permissible ambient conditions		
Operating temperature	-40 °C – +70 °C (with ST and SC) / -20 °C – +55 °C (all others)	
Constructive design		
Dimensions (W x H x D)	60 mm x 120 mm x 110 mm	
Assembly	DIN rail	
Weight	500 g	
IP protection class	IP 40	
Housing	Stainless steel, powder coated	
Technical approvals		
Basis	CE	
Shipment/accessories		
Shipment	Device, terminal block, operating instructions, DIN rail clip	
Accessories (order separately)	Power supplies, assembly angle, patch cables	

SAP no.	P/ST	H/ST	MM/ST	MM/SC	SM/ST	SM/SC	SM/E2	SM/SC / BIDI-A / BIDI-B
DL-485	10000058	10000060	10000062	10000070	10000256	10000083	10000085	10000062 / 10000081
DL-485-2X	10000086	10000088	10000090	10000296	10000303	10000316	10000317	–
DL-485-PB	–	–	10000325	10000327	10000332	10000337	10000339	10000334 / 10000335
DL-485-PB2X	10000341	–	10000345	10000347	10000353	10000357	10000359	–
DL-485-PBR	10000367	10000369	10000371	10000373	10000311	10000314	10000375	10000313
DLS-485-PBR	–	–	–	–	–	10008243	–	–





Product	DL-485-MB /DL-485-MBR	DL-485-MBP /DL-485-MBP2X /DL-485-MBPR
Description	MODBUS-FO-system - standard /redundant	
Article no.	0100079 xx	
Port type and amount	1 x or 2 x optical: ST, SC, E2000 or SC/BIDI, 1 x electrical: Sub-D 9 pin, female	
Electrical interface		
Signal type	RS485 2 wire transmission for MODBUS/MODBUS-RTU	RS485 2 wire transmission for MODBUS-PLUS
Data rate	9.6 - 19.2 - 38.4 - 93.75 - 57.6 - 115.2 kBit/s (automatic)	1 MBit/s
Transmission type	Half duplex	
Terminating resistor	Switchable: Pull-Up (R _{PU}), Pull-Down (R _{PD}), terminating resistor (R _W)	—
Signal LEDs/interfaces		
Status LEDs	Failure (red)/Data (green)/Power (green), Fiberview (red, yellow, green)	
Failure relay	25 VDC (1 A) / 60 VDC (0.3 A) (DL-485-MBP and DL-485-MBPR: only optional)	
Connector	9 pin SUB-D female, 2 x 4 pin and 1 x 6 pin terminal	
Fiber type /range /budget		
POF 980 /1000 µm (180 dB /km)	0 m – 50 m, optical budget 12 dB with 650 nm	
Multimode 62.5 (50) /125 µm (2 dB /km)	0 m – 5 km, optical budget 13 dB with 1300 nm (BIDI 1310 nm /1550 nm)	
Singlemode 9 /125 µm (0.4 dB /km)	0 m – 30 km, optical budget 17 dB with 1310 nm (BIDI 1310 nm /1550 nm) (other distances on request)	
Supply		
Power supply	12 – 30 VDC or 24 – 60 VDC	
Power consumption at 24 VDC	Max. 150 mA	
Redundancy		
Redundancy functions	Optical redundant ring structure (DL-485-MBR)	Optical redundant ring structure (DL-485-MBPR)
Permissible ambient conditions		
Operating temperature	-40 °C – +70 °C (with ST and SC) / -20 °C – +55 °C (all others)	
Constructive design		
Dimensions (W x H x D)	60 mm x 120 mm x 110 mm	
Assembly	DIN rail	
Weight	500 g	
IP protection class	IP 40	
Housing	Stainless steel, powder coated	
Technical approvals		
Basis	CE	
Shipment /accessories		
Shipment	Device, terminal block, operating instructions, DIN rail clip	
Accessories (order separately)	Power supplies, assembly angle, patch cables	

SAP no.	P/ST	H/ST	MM/ST	MM/SC	SM/ST	SM/SC	SM/E2
DL-485-MB	—	—	10000431	10000432	10000433	10000434	—
DL-485-MBR	—	—	10000518	10000519	10000427	10000428	—
DL-485-MBP	10000378	10000380	10000381	10000382	10000385	10000386	10000387
DL-485-MBP2X	10000388	10000390	10007019	10000393	10000395	10000396	10000397
DL-485-MBPR	—	—	10000518	10000519	10000427	10000428	—

Others on request

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Product	DL-CAN-FV / DL-CAN-FV2X / DL-CAN-R	DL-TTY
Description	CAN-Bus-FO-system - protocol transparent	TTY-FO-system - protocol transparent
Article no.	010007 xxx	0100041 xx
Port type and amount	1 x or 2 x optical: ST, SC, E2000 or SC/BIDI 1 x electrical: Sub-D 9 pin, female	1 x optical: ST, SC or SC/BIDI 1 x electrical: Sub-D 9 pin, female
Electrical interface		
Signal type	CAN-BUS	Asynchronous TTY interface (20 mA active, half active or passive)
Data rate	10, 20, 22.2, 50, 125, 250, 500, 800, 1000 kBaud (switchable)	Max. 115.2 kBit/s
Transmission type	Half duplex	Full duplex: active, half active or passive, half duplex: active or passive
Terminating resistor	Switchable: none or terminating resistor (R _W)	—
Signal LEDs / interfaces		
Status LEDs	Failure (red) / Data (green) / Power (green), Fiberview (red, yellow, green)	
Failure relay	25 VDC (1 A) / 60 VDC (0.3 A)	
Connector	9 pin SUB-D female, 2 x 4 pin and 1 x 6 pin terminal	
Fiber type / range / budget		
POF 980 / 1000 μm (180 dB / km)	0 m – 50 m, optical budget 12 dB with 650 nm	
Multimode 62.5 (50) / 125 μm (2 dB / km)	0 m – 5 km, optical budget 13 dB with 1300 nm (BIDI 1310 nm / 1550 nm)	
Singlemode 9 / 125 μm (0.4 dB / km)	0 m – 30 km, optical budget 17 dB with 1310 nm (BIDI 1310 nm / 1550 nm) [other distances on request]	
Supply		
Power supply	12 – 30 VDC or 24 – 60 VDC	
Power consumption at 24 VDC	Max. 150 mA	
Redundancy		
Redundancy functions	Optical redundant ring structure (DL-CAN-R)	—
Permissible ambient conditions		
Operating temperature	-40 °C – +70 °C (with ST and SC) / -20 °C – +55 °C (all others)	
Constructive design		
Dimensions (W x H x D)	60 mm x 120 mm x 110 mm	
Assembly	DIN rail	
Weight	500 g	
IP protection class	IP 20	
Housing	Stainless steel, powder coated	
Technical approvals		
Basis	CE	
Shipment/accessories		
Shipment	Device, terminal block, operating instructions, DIN rail clip	
Accessories (order separately)	Power supplies, assembly angle, patch cables	

SAP no.	P/ST	H/ST	MM/ST	MM/SC	SM/ST	SM/SC	SM/SC / BIDI-A / BIDI-B
DL-CAN-FV	10000459	10007661	10007664	10000467	10000470	10000474	10000471 / 10000472
DL-CAN-FV2X	10000496	10007661	10000498	10000500	10000503	10000505	—
DL-CAN-R	10000507	—	10000508	1000509	10000511	10007739	—
DL-TTY	10000240	10000242	10006907	10007147	10006902	10006901	10000253 / 10000260

Others on request





Product	DL-232 / DL-232-2X / DL-232-R	DL-232-MUX
Description	RS232-F0-system - protocol transparent	RS232-Multiplexer-F0-system
Article no.	010001 xxx	0100012 xx
Port type and amount	1 x or 2 x optical: ST, SC or SC/BIDI, 1 x electrical: Sub-D 9 pin, female	1 x optical: ST, SC or SC/BIDI 1 x electrical: Sub-D 9 pin, female
Electrical interface		
Signal type	RS232 (V24) with Software-handshake	4 x RS232 (V24) with Software-handshake
Data rate	Max. 115.2 kBit/s	
Transmission type	Full duplex, half duplex with DL-232-2X	Full duplex
Terminating resistor	—	
Signal LEDs/interfaces		
Status LEDs	Failure (red) / Data (yellow) / Power (green), Fiberview (red, yellow, green)	Failure (red) / Data (yellow) / Power (green)
Failure relay	25 VDC (1 A) / 60 VDC (0.3 A)	
Connector	9 pin SUB-D female, 2 x 4 pin and 1 x 6 pin terminal	9 pin SUB-D female, 2 x 4 pin terminal
Fiber type / range / budget		
POF 980 / 1000 μm (180 dB/km)	0 m – 50 m, optical budget 12 dB with 650 nm	
Multimode 62.5 (50) / 125 μm (2 dB/km)	0 m – 5 km, optical budget 13 dB with 1300 nm (BIDI 1310 nm / 1550 nm)	
Singlemode 9 / 125 μm (0.4 dB/km)	0 m – 30 km, optical budget 17 dB with 1310 nm (BIDI 1310 nm / 1550 nm) (other distances on request)	
Supply		
Power supply	12 – 30 VDC or 24 – 60 VDC	
Power consumption at 24 VDC	Max. 150 mA	Max. 200 mA
Redundancy		
Redundancy functions	Optical redundant ring structure (DL-232-R)	—
Permissible ambient conditions		
Operating temperature	-40 °C – +70 °C (with ST and SC) / -20 °C – +55 °C (all others)	
Constructive design		
Dimensions (W x H x D)	60 mm x 120 mm x 110 mm	
Assembly	DIN rail	
Weight	500 g	
IP protection class	IP 20	
Housing	Stainless steel, powder coated	
Technical approvals		
Basis	CE	
Shipment / accessories		
Shipment	Device, terminal block, operating instructions, DIN rail clip	
Accessories (order separately)	Power supplies, assembly angle, patch cables	

SAP no.	P/ST	H/ST	MM/ST	MM/SC	SM/ST	SM/SC	SM/E2	SM/SC / BIDI-A / BIDI-B
DL-232	10000131	—	10000133	1000135	10000141	10000146	10000150	10000142 / 10000144
DL-232-2X	10000152	—	10000153	10000155	10000157	10000170	10000171	—
DL-232-R	—	—	1000197	10000199	10000202	10000204	—	—
DL-232-MUX	10004684	10000179	10000181	10000182	10000186	10000191	10000193	10000187 / 10000189

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Others on request

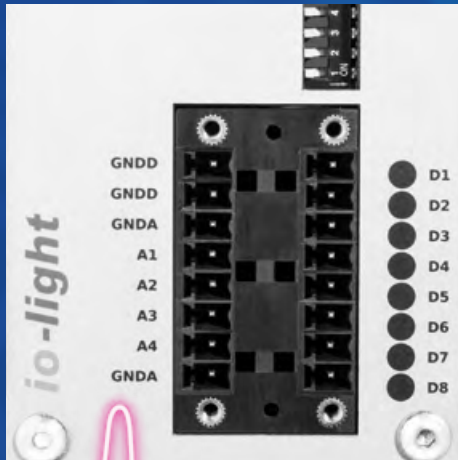


Product	DL-422/DL-422-2X
Description	RS422-F0-system - protocol transparent
Article no.	0100021 xx
Port type and amount	1 x or 2 x optical: ST, SC or SC/BIDI, 1 x electrical: Sub-D 9 pin, female
Electrical interface	
Signal type	RS422 4-wire transmission
Data rate	1.5 MBit/s (divided by the amount of routes)
Transmission type	Full duplex, half duplex with DL-422-2X
Terminating resistor	Switchable: Pull-Up (R_{PU}), Pull-Down (R_{PD}), terminating resistor (R_W)
Signal LEDs/interfaces	
Status LEDs	Failure (red)/Data (green)/Power (green), Fiberview (red, yellow, green)
Failure relay	25 VDC (1 A) / 60 VDC (0.3 A)
Connector	4 pin and 6 pin terminal
Fiber type / range / budget	
POF 980 / 1000 μm (180 dB / km)	0 m – 50 m, optical budget 12 dB with 650 nm
Multimode 62.5 (50) / 125 μm (2 dB / km)	0 m – 5 km, optical budget 13 dB with 1300 nm (BIDI 1310 nm / 1550 nm)
Singlemode 9 / 125 μm (0.4 dB / km)	0 m – 30 km, optical budget 17 dB with 1310 nm (BIDI 1310 nm / 1550 nm) (other distances on request)
Supply	
Power supply	12 – 30 VDC or 24 – 60 VDC
Power consumption at 24 VDC	Max. 150 mA
Redundancy	
Redundancy functions	–
Permissible ambient conditions	
Operating temperature	-40 °C – +70 °C (with ST and SC) / -20 °C – +55 °C (all others)
Constructive design	
Dimensions (W x H x D)	60 mm x 120 mm x 110 mm
Assembly	DIN rail
Weight	500 g
IP protection class	IP 20
Housing	Stainless steel, powder coated
Technical approvals	
Basis	CE
Shipment/accessories	
Shipment	Device, terminal block, operating instructions, DIN rail clip
Accessories (order separately)	Power supplies, assembly angle, patch cables



SAP no.	P/ST	H/ST	MM/ST	MM/SC	SM/ST	SM/SC	SM/E2
DL-422	10000205	10000207	10007490	10000210	10000215	10000219	10000221
DL-422-2X	10000222	10000224	10007492	10000227	10000159	10000160	10000161

Others
on request



Our io-light series comprises DIN rail I/O converters. Analog signals (0 – 10 V or 0 – 20 mA) and/or digital signals can be transmitted bidirectional via fiber optics. Receivers can be reliably controlled and the status signaled by means of feedback. The switching signals and the feedback signals are transmitted either via two fibers or – in the case of versions with BIDI technology – via one single fiber.

We offer more than 20 versions which are different regarding signal, fiber or connector type.

ANALOG / DIGITAL

THE COMMON APPLICATION AREAS:

- Process automation/process control engineering
- Manufacturing automation
- Building automation
- Tunnel automation and SCADA systems

THE PREDOMINANT BRANCHES:

- Renewable energy
- Process engineering
- Security

YOUR ADVANTAGES AND BENEFITS:

- Plug & Play solutions
- Global and universal usable
- Simple connection and configuration
- High reliability and high future security

PRODUCT MATRIX
ANALOG / DIGITAL

	General		Application area		Power supply		Temperature range		Topology		Physics				Other		Technical approvals	Catalog
	Product name	IO converter	DIN rail	12 – 30 (24 – 60) VDC	Wide temperature range -40 °C/+70 °C	Point to point	Drop (bus)	S0 impulse signal	0 – 10 V	0 – 20 mA	Digital input / output	Potential-free relay contact (CC)	Transistor output	Fault signal contact	IP protection class	Dimensions in mm (W x H x D)	CE	Page
Unidirectional																		
Unidirectional analog and contact closure FO-system	IOL-3000	●	●	●	●	●	●		Max. 4	Max. 4	Max. 8	● / –	●	●	IP 20	60 x 120 x 110	●	17
Unidirectional contact closure FO-system	IOL-3200	●	●	●	●	●	●				12		●	●	IP 20	60 x 120 x 110	●	17
Unidirectional impulse signal FO-system	IOL-3400	●	●	●	●	●		1					●	●	IP 20	22.5 x 80 x 95	●	18
Bidirectional																		
Bidirectional contact closure FO-system	IOL-3100	●	●	●	●	●					4	●		●	IP 20	60 x 120 x 110	●	19
	IOL-3300	●	●	●	●	●					1	●		●	IP 20	22.5 x 80 x 95	●	19

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LEGEND

GENERAL



CE label



RoHS label



Wide temperature range



5 years warranty



Made in Germany

PRODUCT SPECIFIC



4 x Analog 0 – 10 V or
4 x Analog 0 – 20 mA
unidirectional



4 x Analog 0 – 10 V or
4 x Analog 0 – 20 mA
8 x Digital 12 – 24 VDC
unidirectional



8 x Digital 12 – 24 VDC
unidirectional



4 x Digital 12 – 24 VDC
bidirectional



12 x Digital 12 – 24 VDC
unidirectional



1 x Digital 12 – 24 VDC
bidirectional



1 x S0
unidirectional



Contact closure –
potential-free relay contact



Transistor output



Product	IOL-3000	IOL-3200
Description	Unidirectional analog and contact closure FO-system	Unidirectional contact closure FO-system
Article no.	03000 xx xx	03200 xx xx
Port type and amount	Max. 8 x contact closure / max. 4 x analog signals / 1 fiberport-ST, SC, EC2000	12 x contact closure / 1 fiberport-ST, SC, E2000
LEDs / interfaces		
Status LEDs	Power (green) / Data (green) / Failure (red)	Power (green) / Failure (red), Fiberview (red, yellow, green)
Failure relay (load capacity)	25 VDC (1 A) / 60 VDC (0.3 A)	
Connector	16 pin screw terminal (contact and analog signals) / 4 pin terminal (supply) / 4 pin terminal (fault relay)	
Fiber type / range / budget		
POF 980 / 1000 μm (180 dB/km)	0 m – 50 m, optical budget 12 dB with 650 nm	
HCS 200 / 230 μm (8 dB/km)	0 m – 200 m, optical budget 12 dB with 850 nm	
Multimode 62.5 (50) / 125 μm (1 dB/km)	0 m – 5 km, optical budget 13 dB with 1300 nm	
Singlemode 9 / 125 μm (0.3 dB/km)	0 m – 30 km, optical budget 17 dB with 1310 nm (other distances on request)	
Signal properties		
Signal input, digital	12 – 24 VDC / 5 mA	
Signal output, digital	12 – 24 VDC / 5 mA or 30 VDC (1 A) / 60 VDC (0.2 A)	30 VDC (1 A) / 60 VDC (0.2 A)
Signal input, analog	0 – 10 V or 0 – 20 mA	–
Signal output, analog	0 – 10 V or 0 – 20 mA	–
Supply		
Power supply	12 – 30 VDC	
Power consumption at 24 VDC	5 watt, 200 mA	
Permissible ambient conditions		
Operating temperature	-40 °C – +70 °C (Multimode and Singlemode ST or SC) / -20 °C – +50 °C (all others)	
Constructive design		
Dimensions (W x H x D)	60 mm x 120 mm x 110 mm	
Assembly	DIN rail	
Weight	570 g	
IP protection class	IP 20	
Housing	Stainless steel, powder coated	
Technical approvals		
Basis	CE	

SAP no.	MM/ST	MM/SC	SM/ST	SM/SC	SM/E2
IOL-3000/TX-8D4A (0 – 20 mA)	10001257	10001259	10001267	10001269	10001271
IOL-3000/RX-8D4A (0 – 20 mA)	10001310	10001311	10001313	10001315	10001317
IOL-3000/TX-8D	10001246	10001248	10001252	10001253	10001254
IOL-3000/RX-8D	10001293	10001296	10001299	10001302	10001305
IOL-3000/TX-4A (0 – 20 mA)	10001274	10001275	10001276	10001277	10001278
IOL-3000/RX-4A (0 – 20 mA)	10001320	10001321	10001322	10001323	10001324
IOL-3200/TX-12D	10001350	10001351	10001352	10001353	10007015
IOL-3200/RX-12D	10001354	10001355	10001356	10001357	10007014

Others on request





Product	IOL-3400
Description	Unidirectional impulse signal FO-system
Article no.	03400 xx xx
Port type and amount	1 x S0 impulse signal/1 fiberport-ST, SC, E2000
LEDs/interfaces	
Status LEDs	Power (green)/Data (green)/Failure (red)
Failure relay (load capacity)	25 VDC (1 A) / 60 VDC (0.3 A)
Connector	3 pin screwed connection (contact closure) / 3 pin screwed connection (supply and fault contact)
Fiber type / range / budget	
POF 980 / 1000 μm (180 dB/km)	0 m – 50 m, optical budget 12 dB with 650 nm
HCS 200 / 230 μm (8 dB/km)	0 m – 200 m, optical budget 12 dB with 850 nm
Multimode 62.5 (50) / 125 μm (1 dB/km)	0 m – 5 km, optical budget 13 dB with 1300 nm
Singlemode 9 / 125 μm (0.3 dB/km)	0 m – 30 km, optical budget 17 dB with 1310 nm (other distances on request)
Signal properties	
Signal input, digital	According to EN62053-31, class A or B dependent from IOL-3400 power supply
Signal output, digital	According to EN62053-31
Signal input, analog	According to EN62053-31, class A or B
Signal output, analog	According to EN62053-31
Supply	
Power supply	12 – 30 VDC
Power consumption at 24 VDC	2.5 watt, 100 mA
Permissible ambient conditions	
Operating temperature	-40 °C – +70 °C (Multimode and Singlemode ST or SC) / -20 °C – +50 °C (all others)
Constructive design	
Dimensions (W x H x D)	22.5 mm x 80 mm x 95 mm
Assembly	DIN rail
Weight	150 g
IP protection class	IP 20
Housing	Polyamide, blue
Technical approvals	
Basis	CE
Shipment / accessories	
Shipment	Device, operating instructions
Accessories (order separately)	Power supplies, patch cables



SAP no.	MM/ST	MM/SC	SM/SC
IOL-3400/TX-1S0	10001494	10001495	10001496
IOL-3400/RX-1S0	10001497	10001498	10001499

Others
on request

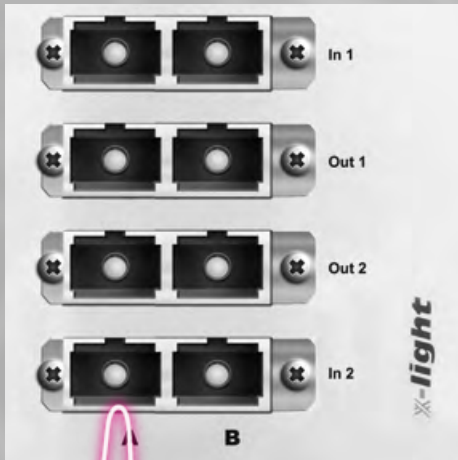


Product	IOL-3100	IOL-3300
Description	Bidirectional contact closure FO-system	
Article no.	03100 xx xx IR	03300 xx xx IR
Port type and amount	4 x contact closure/1 fiberport-ST, SC, E2000	1 x contact closure/1 fiberport-ST, SC, E2000
LEDs/ interfaces		
Status LEDs	Power (green)/Data (green)/Failure (red)	Power (green)/Data (green)/Status (red)
Failure relay (load capacity)	25 VDC (1 A) / 60 VDC (0.3 A)	
Connector	16 pin screw terminal (contact and analog signals) / 4 pin terminal (supply) / 4 pin terminal (fault relay)	3 pin screwed connection (contact closure) / 3 pin screwed connection (supply and fault contact)
Fiber type / range / budget		
POF 980/1000 μm (180 dB/km)	0 m – 50 m, optical budget 12 dB with 650 nm	
HCS 200/230 μm (8 dB/km)	0 m – 200 m, optical budget 12 dB with 850 nm	
Multimode 62.5 (50)/125 μm (1 dB/km)	0 m – 5 km, optical budget 13 dB with 1300 nm	
Singlemode 9/125 μm (0.3 dB/km)	0 m – 30 km, optical budget 17 dB with 1310 nm (other distances on request)	
Signal properties		
Signal input, digital	12 – 24 VDC / 5 mA	
Signal output, digital	30 VDC (1 A) / 60 VDC (0.2 A)	24 VAC (1 A) / 24 VDC (1 A) / 60 VDC (0.3 A)
Signal input, analog	—	
Signal output, analog	—	
Supply		
Power supply	12 – 30 VDC	
Power consumption at 24 VDC	5 watt, 200 mA	2.5 watt, 100 mA
Permissible ambient conditions		
Operating temperature	-40 °C – +70 °C (Multimode and Singlemode ST or SC) / -20 °C – +50 °C (all others)	
Constructive design		
Dimensions (W x H x D)	60 mm x 120 mm x 110 mm	22.5 mm x 80 mm x 95 mm
Assembly	DIN rail	
Weight	570 g	150 g
IP protection class	IP 20	
Housing	Stainless steel, powder coated	Polyamide, blue
Technical approvals		
Basis	CE	
Shipment/accessories		
Shipment	Device, 2 x 4 pin and 16 pin terminal block, DIN rail clip, operating instructions	Device, operating instructions
Accessories (order separately)	Power supplies, patch cables	



SAP no.	MM/ST	MM/SC	SM/ST	SM/SC	SM/E2	SM-SC /BIDI
IOL-3100/TRX-4D	10001436	10001439	10001440	10001444	10001445	—
IOL-3300/TRX-1D	10001358	10001479	10001482	10001485	—	10001483 / 10001484

Others on request



With the x-light system, we have developed an industry compatible optical bypass, which is protocol transparent and supports therefore Ethernet as well as all fieldbuses and numerous interfaces such as RS485. Works with devices from other manufacturers and can be integrated in ring and line topologies.

x-light therefore guarantees reliable production processes and the availability of data connections.

Depending on the protocol, topology, and number of active devices, redundancy procedures ensure switching times of a few milliseconds. Even if several errors occur at the same time, the data communication is trouble-free.

BYPASS

THE COMMON APPLICATION AREAS:

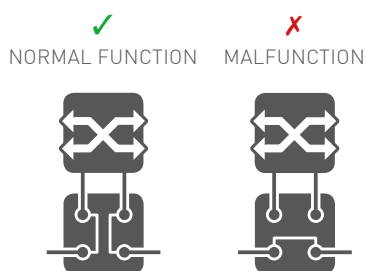
- Process and production engineering
- Control technology
- SCADA networking

THE PREDOMINANT BRANCHES:

- Energy technology / Wind power
- Power stations
- Process and plant engineering
- Security

YOUR ADVANTAGES AND BENEFITS:

- Increase of reliability especially for multiple points of failure
- Availability of ring and bus topologies if power or system failure
- Universally applicable
- Protection against effects of hardware and software bugs
- Increased availability by fault tolerant glass fiber net



Product	XL-1	XL-2
Description	Optical Bypass	
Article no.	01500 xx xx	01520 xx xx
Port type and amount	4 x FO ports: ST, SC or LC	
LEDs / interfaces		
Status LEDs	Power (green)/Ready (green)	
Failure relay (load capacity)	25 VDC (1A) / 60 VDC (0.3 A)	
Connector	2 x 4 pin terminal (supply, fault relay)	
Bypass parameter		
Insertion loss Multimode	1,4 dB (850 nm / 1310 nm, ±40 nm)	1,5 dB (850 nm / 1310 nm, ±40 nm)
Insertion loss Singlemode	1,7 dB (1310 nm / 1550 nm, ±40 nm)	1,5 dB (1310 nm / 1550 nm, ±40 nm)
Durability switch mirror	10 million cycles	
Switching speed	typ. 4 ms, max. 15 ms	
Switch-on delay	0 s, 5 s, 10 s, 20 s and/or 40 s switchable by DIP-switch	
Switching wave	1 V, 2 V, 4 V, 8 V, 16 V and/or 32 V in a range between 10 V and 60 V switchable by DIP-switch	
Power supply	1 V, 2 V, 4 V, 8 V, 16 V and/or 32 V in a range between 10 V and 60 V switchable by DIP-switch	
Supply		
Power supply	10 – 60 VDC	
Power consumption	2.5 watt	
Permissible ambient conditions		
Operating temperature	-40 °C – +70 °C	-20 °C – +55 °C
Constructive design		
Dimensions (W x H x D)	60 mm x 120 mm x 110 mm	
Assembly	DIN rail	
Weight	500 g	
IP protection class	IP 30	
Housing	Stainless steel, powder coated	
Technical approvals		
Basis	CE	
Security for industrial control equipment	cUL61010-2-201	
Shipment/accessories		
Shipment	Device, 2 x 4 pin terminal block, DIN rail clip, operating instructions	
Accessories (order separately)	Power supplies, patch cables	

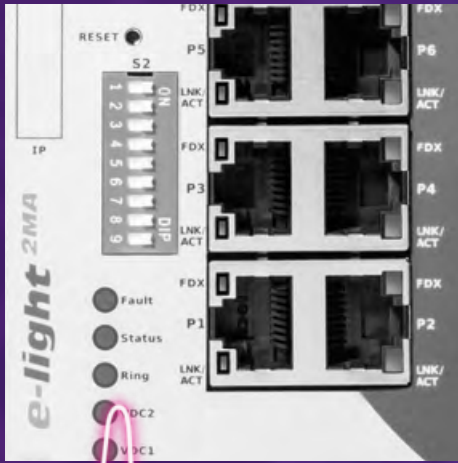
Explanation general icons: see previous chapter

SAP no.	50 / 125 MM/ST	50 / 125 MM/SC	50 / 125 MM/LC	62,5 / 125 MM/ST	62,5 / 125 MM/SC	62,5 / 125 MM/LC	9 / 125 SM/ST	9 / 125 SM/SC	9 / 125 SM/LC
XL-1	10000634	10000635	10000636	10000637	10000638	10000639	10000630	10000631	10000632
XL-2	10007618	10007619	10007620	10007621	10007622	10007623	10007624	10007625	10007626



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Others on request



Media converters and switches from the e-light series are especially designed for industrial applications indoor as well as outdoor.

They have got a robust housing, compact design and an extended input voltage range. They can be used with all fiber types such as Multimode, Singlemode POF and HCS (PCF). Furthermore, the products support at Multimode and Singlemode the BIDI technology.

The media converters also offer a high degree of flexibility with regard to the optical connectors. They are available with ST, SC, SC-BIDI and E-2000 connectors.

Additionally, in this chapter you will find our new developed system:

Our smart cable junction box pe-light.

It combines passive and active components and can be fitted as on-ly system into public lighting poles and is therefore perfect for all SmartCity/Smart building applications and security systems.

ETHERNET

THE COMMON APPLICATION AREAS:

- Process automation/process control engineering
- Building automation
- Traffic control technology/tunnel automation
- SCADA Systems
- Cross-linking of intelligent transportation systems (ITS)

pe-light:

- Digital traffic information
- Surveillance cameras (CCTV)
- Sensor systems
- Access points

THE PREDOMINANT BRANCHES:

- Renewable energy
- Process engineering
- Traffic engineering
- Industrial automation
- Security / surveillance

YOUR ADVANTAGES AND BENEFITS:

- Applications in wide temperature ranges possible
- TSN Ready
- Suitable for outdoor use

pe-light:

- Protection against vandalism as well as wind and weather
- Aesthetics through integration into the mast
- Increased IP protection class

PRODUCT MATRIX ETHERNET

	General			Application area			Ports			Power supply	Temperature range	Transmission speed		Redundancy		Physics		Protocol	Other		Technical approvals	Catalog
	Product name	Media converter	Switch	DIN rail	Device according to DIN 43880	Max. total number	Max. number TX	Max. number FX		Wide temperature range -40 °C/+70 °C	Fast Ethernet (100 MBit/s)	Gigabit Ethernet (1000 MBit/s)	Ring (RSTP) / Ring (MRP)	POE (Power source / PSE)	POE+ (Power source / PSE)	POE++ (Power source / PSE)	PROFINET	IP protection class	Dimensions in mm (W x H x D)		CE / UL	Page

Unmanaged

Fast Ethernet media converter	EL-100-XS EL-100-PC	●	●		2	1	1	12 – 24 VDC	●	●								IP 20	25 x 63 x 80	●/—	25
	EL-100-XSP	●	●		2	1	1	50 – 57 VDC	●	●			●	●				IP 20	63 x 95 x 25	●/—	25
	EL-100-3 EL-100-3P	●	●		2	1	1	12 – 24 VDC 45 – 60 VDC	-10 °C / +60 °C	●			—	—				IP 20	22,5 x 80 x 95	●/—	26
	EL-100-S (IP65)	●	●		2	1	1	12 – 48 VDC	●	●								IP 65	60 x 60 x 100	●/—	26
Gigabit Ethernet media converter	EL-1000-XSG EL-1000-XSGP	●	●		2	1	1	12 – 60 VDC 50 – 57 VDC	●	●			—	—				IP 20	63 x 95 x 25	●/●	27
	EL-1000-3G	●	●		2	1	1	12 – 65 VDC	-10 °C / +55 °C	●								IP 20	22,5 x 80 x 95	●/—	27
Fast Ethernet media converter	EL-100-XS-SFP EL-100-XSP-SFP	●	●		2	1	1	12 – 30 VDC 50 – 57 VDC	●	●			—	—	—			IP 40	63 x 63 x 25	●/●	28
Gigabit Ethernet media converter	EL-1000-XSG-SFP EL-1000-XSGP-SFP	●	●		2	1	1	12 – 30 VDC 50 – 57 VDC	●	●			—	—	—			IP 40	63 x 63 x 25	●/●	28
Gigabit Ethernet PoE injector	EL-1000-4G-INJ-1Tx		●		2	2	0	24 – 48 VDC	●	●			●	●				IP 20	27 x 140 x 106	●/—	29
	EL-1000-4G-INJ-4Tx		●		8	8	0	24 – 48 VDC	●	●			●	●				IP 20	30 x 155 x 118	●/—	29
Fast Ethernet switch	EL-100-4		●	●	10	8	4	12 – 30 VDC	●	●								IP 20	155 x 30 x 110	●/●	30
Gigabit Ethernet switch	EL-1000-4G		●	●	10	8	2	12 – 60 VDC	●	●								IP 20	174 x 30 x 101	●/●	30
Fast/gigabit Ethernet switch	EL-1100-4AC EL-1100-4DC		●	●	17	16	1	230 VAC 12 – 60 VDC	-20 °C / +60 °C	●	●							IP 20	42 x 176 x 108	●/—	31

Managed

Fast Ethernet switch	EL-100-2MA		●	●	8	6	4	12 – 60 VDC	-40 °C / +55 °C	●		●					●	IP 20	145 x 70 x 130	●/●	32
Gigabit Ethernet switch	EL-1000-4GM		●	●	10	8	2	12 – 60 VDC	●	●	●						●	IP 20	30 x 165 x 101	●/●	32

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LEGEND

GENERAL



CE label



FCC label



UL label



RoHS label



Wide temperature range



5 years warranty



Made in Germany

PRODUCT SPECIFIC



Fast Ethernet



Gigabit Ethernet



Ring redundancy



Managed systems



PROFIBUS & PROFINET certified



SFP plug-in optics



FX - Fiber optics connection



Internet protocol version 6



Increased IP protection class



M12 connectors



Power over Ethernet 15 watt



Power over Ethernet (+) 30 watt



Power over Ethernet (++) 60 watt

PRODUCT MATRIX E-LIGHT Page 23

PRODUCT MATRIX PE-LIGHT Page 33

PRODUCT MATRIX E-COM Page 40



Product	EL-100-XS / EL-100-PC	EL-100-XSP
Description	Fast Ethernet media converter, unmanaged	Fast Ethernet PoE media converter, unmanaged
Article no.	0420 x 01 xx	0420201 xx
Port type and amount	1 x 10/100BASE-TX: RJ45 1 x 100BASE-FX: Crimp (POF), ST, SC, E2000 or BIDI-SC	1 x 10/100BASE-T: RJ45 1 x 100BASE-FX: SC PoE: 802.3at/Power over Ethernet Plus
LEDs / interfaces		
Status LEDs	RJ45 (green) / F0 (yellow)	Power (green)/Ports (green)/PoE (green)
Connector	2 pin terminal	
Fiber type / range / budget		
Twisted pair	0 m – 100 m (Cat5e)	
POF 980/1000 µm (180 dB/km)	0 m – 40 m, optical budget 12 dB with 650 nm	
HCS 200/230 µm (8 dB/km)	0 m – 200 m, optical budget 12 dB with 850 nm	
Multimode 50/125 µm (1 dB/km)	0 m – 5 km, optical budget 13 dB with 1300 nm	
Multimode 62.5/125 µm (1 dB/km)	0 m – 5 km, optical budget 13 dB with 1300 nm	
Singlemode 9/125 µm (0.3 dB/km)	0 m – 30 km, optical budget 16 dB with 1310 nm (other distances on request)	
Supply		
Power supply	12 – 24 VDC	50 – 57 VDC
Power consumption	2.5 watt	3 watt + PoE
Permissible ambient conditions		
Operating temperature	-40 °C – +70 °C	
Constructive design		
Dimensions (W x H x D)	80 mm x 63 mm x 25 mm (incl. connector)	63 mm x 95 mm x 25 mm (incl. connector)
Assembly	DIN rail / wall mounting / PC mounting (EL-100-PC)	DIN rail
Weight	200g	210g
IP protection class	IP 20	
Housing	Stainless steel, powder coated	
Technical approvals		
Basis	CE	
Shipment/accessories		
Shipment	Device, terminal block, DIN rail clip, operating instructions	
Accessories (order separately)	Power supplies, patch cables	



SAP no.	P/ST	H/ST	MM/ST	MM/SC	MM/SC / BIDI	SM/ST	SM/SC	SM/E2	SM/SC / BIDI
EL-100-XS	10001718	10001720	10001725	10001728	10001732 10001733	10001761	10001763	10001766	10001768 10001771
EL-100-XSP	—	—	—	10007456	—	—	10007457	—	—
EL-100-PC	—	—	10007434	10006521	—	—	—	—	—

Others on request



Product	EL-100-3/EL-100-3P	EL-100-S
Description	Fast Ethernet (PoE) media converter, unmanaged	Fast Ethernet media converter, unmanaged, IP65
Article no.	0450001 xx / 0460001 xx	0420501 xx
Port type and amount	1 x 10/100BASE-TX: RJ45 1 x 100BASE-FX: Clamp (POF), ST, SC, E2000 or BIDI IEEE 802.3at PoE+ (only EL-100-3P)	1 x 10/100BASE-TX: RJ45 1 x 100BASE-FX: Outdoor connector revos E2000 or BIDI
LEDs/interfaces		
Status LEDs	Port TX (green/yellow)/Port Fiber (yellow)/PoE (red)	Port TX (green/yellow)/Port Fiber (yellow)/Power (green/red)
Failure relay (load capacity)	—	
Connector	2 x 3 pin screw terminal	2 pin terminal
Fiber type / range / budget		
Twisted pair	0 m – 100 m (Cat 6)	
POF 980/1000 μm (180 dB/km)	0 m – 40 m, optical budget 12 dB with 650 nm	—
HCS 200/230 μm (8 dB/km)	0 m – 200 m, optical budget 12 dB with 850 nm	—
Multimode 50/125 μm (1 dB/km)	0 m – 5 km, optical budget 12 dB with 1300 nm	0 m – 5 km, optical budget 13 dB with 1300 nm
Multimode 62.5/125 μm (1 dB/km)	0 m – 4 km, optical budget 15 dB with 1300 nm	0 m – 5 km, optical budget 13 dB with 1300 nm
Singlemode 9/125 μm (0.3 dB/km)	0 m – 30 km, optical budget 16 dB with 1310 nm (other distances on request)	0 m – 15 km, optical budget 23 dB with 1310 nm
Supply		
Power supply	12 – 65 VDC (EL-100-3) 50 – 57 VDC (EL-100-3P)	12 – 48 VDC
Power consumption	2.4 watt + PoE	
Permissible ambient conditions		
Operating temperature	-10 °C – +60 °C	
Constructive design		
Dimensions (W x H x D)	22.5 mm x 80 mm x 95 mm	60 mm x 60 mm x 100 mm
Assembly	DIN rail	Variable mounting in housing walls with up to 4 mm thickness
Weight	150g	350g
IP protection class	IP 20	IP 65 (E2000-side)
Housing	Polyamide, blue	Aluminium/ zinc die cast
Technical approvals		
Basis	CE	
Shipment/ accessories		
Shipment	Device, operating instructions	Device, terminal block, operating instructions
Accessories (order separately)	Power supplies, patch cables	

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SAP no.	P/ST	H/ST	MM/ST	MM/SC	MM/E2	SM/ST	SM/SC	SM/E2
EL-100-3	10006462	10006801	10001794	10001795	10001797	10001800	10001801	10001802
EL-100-3P	—	10001812	10001814	10001816	—	10001817	10001818	—
EL-100-S	—	—	—	—	10006763	—	—	10006792

Others on request



Product	EL-1000-XSG / EL-1000-XSGP	EL-1000-3G
Description	Gigabit Ethernet (PoE) media converter, unmanaged	Gigabit Ethernet media converter, unmanaged
Article no.	0420 x 10 xx	0450010 xx
Port type and amount	1 x 10/100/1000BASE-T: RJ45 1 x 1000BASE-SX/LX: SC, E2000, BIDI-SC PoE: 802.3at/Power over Ethernet Plus (EL-1000-XSGP)	1 x 10/100/1000BASE-T: RJ45 1 x 1000BASE-SX/LX: SC, E2000, BIDI-SC
LEDs / interfaces		
Status LEDs	Power (green)/Lnk/Act (green)/PoE (green)	Port TX (green/yellow)/Port Fiber (yellow/red)
Failure relay (load capacity)	—	—
Connector	3 pin connector plug	2 x 3 pin terminal strip
Fiber type / range / budget		
Twisted pair	0 m – 100 m (Cat 6)	
POF 980/1000 μm (180 dB/km)	—	
HCS 200/230 μm (8 dB/km)	—	
Multimode 50/125 μm (1 dB/km)	0 m – 550 m, optical budget 7.5 dB with 850 nm	
Multimode 62.5/125 μm (1 dB/km)	0 m – 275 m, optical budget 7.5 dB with 850 nm	
Singlemode 9/125 μm (0.3 dB/km)	0 m – 10 km, optical budget 10.5 dB with 1310 nm (other distances on request)	
Supply		
Power supply	12 – 60 VDC (EL-1000-XSG) 50 – 57 VDC (EL-1000-XSGP)	12 – 65 VDC
Power consumption	3 watt + PoE	2.4 watt
Permissible ambient conditions		
Operating temperature	-40 °C – +70 °C	-10 °C – +55 °C
Constructive design		
Dimensions (W x H x D)	63 mm x 95 mm x 25 mm (incl. connector)	22.5 mm x 80 mm x 95 mm
Assembly	DIN rail	
Weight	210 g	150 g
IP protection class	IP 20	
Housing	Stainless steel, powder coated	Polyamide, blue
Technical approvals		
Basis	CE	
Security for industrial control equipment	UL 61010-1, CAN/CSA-C22.2 No. 61010-1-12 UL 61010-2-201, CSA-C22.2 No. 61010-2-201	—
Shipment/accessories		
Shipment	Device, terminal block, DIN rail clip, operating instructions	Device, operating instructions
Accessories (order separately)	Power supplies, patch cables	

SAP no.	MM/SC	SM/SC	SM/E2
EL-1000-XSG	10007339	10007340	—
EL-1000-XSGP	10007341	10007342	—
EL-1000-3G	10001650	10001804	10006640

Others
on request





Product	EL-100-XS-SFP/EL-100-XSP-SFP	EL-1000-XSG-SFP/EL-1000-XSGP-SFP
Description	Fast Ethernet (PoE) media converter, unmanaged	Gigabit Ethernet (PoE) media converter, unmanaged
Article no.	0420 x 0199	0420 x 1099
Port type and amount	1 x 10/100BASE-TX: RJ45 1 x 100 MBit/s SFP PoE: 802.3bt up to 90 W (XSP)	1 x 10/100/1000BASE-T: RJ45 1 x 1000 MBit/s SFP PoE: 802.3bt up to 90 W (XSGP)
LEDs/interfaces		
Status LEDs	Power (green) / PoE (green) / Failure (red) / Link (yellow) / Act (green)	
Failure relay (load capacity)	30 VDC (1 A)	
Connector	5 pin connector plug	
Fiber type/range/budget		
Twisted pair	0 m – 100 m (Cat 6)	
POF 980/1000 μm (180 dB/km)	–	
HCS 200/230 μm (8 dB/km)	–	
Multimode 50/125 μm (1 dB/km)	see SFPs (page 63 – 64)	
Multimode 62,5/125 μm (1 dB/km)	see SFPs (page 63 – 64)	
Singlemode 9/125 μm (0,3 dB/km)	see SFPs (page 63 – 64)	
Supply		
Power supply	With PoE: 50 – 57 VDC, all others: 12 – 30 VDC	
Power consumption	With PoE: max. 94.0 watt, all others: max. 4.0 watt	
Permissible ambient conditions		
Operating temperature	-40 °C – +70 °C	
Constructive design		
Dimensions (W x H x D)	63 mm x 63 mm x 25 mm (without connector)	
Assembly	DIN rail	
Weight	140 g	
IP protection class	IP 40	
Housing	Stainless steel, powder coated	
Technical approvals		
Basis	CE	
Security for industrial control equipment	UL 61010-1, CAN/CSA-C22.2 No. 61010-1-12 UL 61010-2-201, CSA-C22.2 No. 61010-2-201	
Shipment/accessories		
Shipment	Device, terminal block, DIN rail clip, operating instructions	
Accessories (order separately)	Power supplies, patch cables	

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SAP no.	
EL-100-XS-SFP	10008246
EL-100-XSP-SFP	10008252
EL-1000-XSG-SFP	10008244
EL-1000-XSGP-SFP	10008248

Others on request



Product	EL-1000-4G-INJ-1TX	EL-1000-4G-INJ-4TX
Description	Gigabit Ethernet PoE injector, unmanaged	
Article no.	05101 xxx	05104 xxx
Port type and amount	2 x 10/100/1000BASE-T(X), 1 x PoE according to IEEE802.3bt (max. 60 W), TP cable, RJ45	8 x 10/100/1000BASE-T(X), 4 x PoE according to IEEE802.3bt (max. 120 W/60 W per port), TP cable, RJ45
LEDs / interfaces		
Status LEDs	Power (green) / Port (green/yellow) / Failure (red)	
Failure relay (load capacity)	30 VDC (1 A)	
Connector	6 pin terminal	
Fiber type / range / budget		
Twisted pair	0 m – 100 m (Cat 6)	
POF 980/1000 µm (180 dB/km)	—	
HCS 200/230 µm (8 dB/km)	—	
Multimode 50/125 µm (1 dB/km)	—	
Multimode 62,5/125 µm (1 dB/km)	—	
Singlemode 9/125 µm (0,3 dB/km)	—	
Supply		
Power supply	24 – 48 VDC	
Power consumption	2 watt + PoE	
Permissible ambient conditions		
Operating temperature	-40 °C – +70 °C	
Constructive design		
Dimensions (W x H x D)	27 mm x 140 mm x 106 mm	30 mm x 155 mm x 118 mm
Assembly	DIN rail	
Weight	ca. 350 g	ca. 500 g
IP protection class	IP 20	
Housing	Stainless steel, powder coated	
Technical approvals		
Basis	CE	
Shipment/accessories		
Shipment	Device, terminal block, DIN rail clip, operating instructions	
Accessories (order separately)	Power supplies, patch cables	



SAP no.	
EL-1000-4G-INJ-1TX	10008728
EL-1000-4G-INJ-4TX	10008729

Others
on request



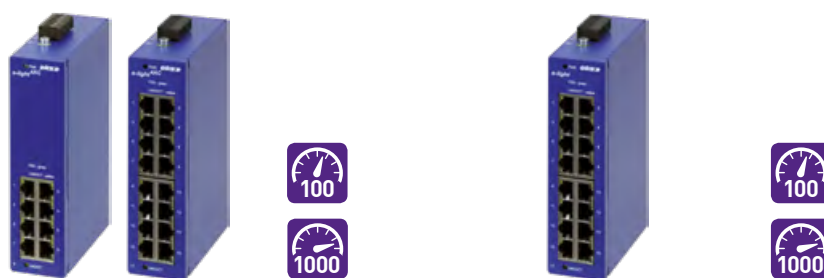
Product	EL-100-4	EL-1000-4G
Description	Fast Ethernet switch, unmanaged	Gigabit Ethernet switch, unmanaged
Article no.	0500 x 01 xx xx xx xx	0500 x 10 xx xx
Port type and amount	5 – 10 Ports in total, max. 4 x 100BASE-FX Ports: ST, SC, E2000 or SFP, max. 8 x 10/100-BASE-TX Ports: RJ45	5 – 10 Ports in total, max. 2 x 1000BASE-SX/LX Ports: SC or SFP, max. 8 x 10/100/1000-BASE-TX Ports: RJ45
LEDs/interfaces		
Status LEDs	Failure (red)/Ports (green/yellow)/Power (green)	
Failure relay (load capacity)	24 VDC (1A) / 60 VDC (0.3 A)	
Connector	6 pin terminal	
Fiber type / range / budget		
Twisted pair	0 m – 100 m (Cat5e)	0 m – 100 m (Cat 6)
Multimode 50/125 µm (1 dB/km)	0 m – 5 km, optical budget 13 dB with 1300 nm	0 m – 550 m, optical budget 7.5 dB with 850 nm
Multimode 62.5/125 µm (1 dB/km)	0 m – 4 km, optical budget 13 dB with 1300 nm	0 m – 275 m, optical budget 7.5 dB with 850 nm
Singlemode 9/125 µm (0.3 dB/km)	0 m – 30 km, optical budget 16 dB with 1310 nm [other distances on request]	0 m – 10 km, optical budget 10.5 dB with 1310 nm [other distances on request]
Supply		
Power supply	5TX: 12 – 48 VDC (redundant) All others: 12 – 60 VDC (redundant)	5TX: 12 – 48 VDC (redundant) All others: 12 – 60 VDC (redundant)
Power consumption at 24 VDC	5TX: 3 watt, 120 mA All others: 7 watt, 300 mA	5TX: 2.5 watt, 100 mA All others: 6.5 watt, 270 mA
Permissible ambient conditions		
Operating temperature	-40 °C – +70 °C	
Constructive design		
Dimensions (W x H x D)	5TX: 25 mm x 130 mm x 105 mm 8TX: 30 mm x 140 mm x 95 mm All others: 30 mm x 155 mm x 118 mm	5TX: 30 mm x 140 mm x 95 mm 8TX/1FX + 2FX: 30 mm x 175 mm x 118 mm All others: 30 mm x 165 mm x 118 mm
Assembly	DIN rail	
Weight	5TX: 400g, all others: 510g	5TX: 550g, all others: 500g
IP protection class	IP 20	
Housing	5TX + 8TX: metal All others: stainless steel, powder coated	5 TX: aluminum All others: stainless steel, powder coated
Technical approvals		
Basis	CE	
Security for industrial control equipment	UL 61010-1, CAN/CSA-C22.2 No. 61010-1-12 UL 61010-2-201, CSA-C22.2 No. 61010-2-201	
Shipment / accessories		
Shipment	Device, terminal block, DIN rail clip, operating instructions	
Accessories (order separately)	Power supplies, patch cables	

SAP no.	5TX	8TX	4TX/1FX	4TX/2FX	8TX/1FX	8TX/2FX	6TX/2FX	4TX/4FX
EL-100-4/RJ45	10008348	10007582	–	–	–	–	–	–
EL-100-4/MM/SC	–	–	10001922	10001926	10001996	10002000	–	10006602
EL-100-4/SM/SC	–	–	10001924	10001929	10001998	10002002	–	10006879
EL-100-4/SFP	–	–	–	–	–	–	–	10006513
EL-1000-4G/RJ45	10007615	10007745	–	–	–	–	–	–
EL-1000-4G/SM-SC	–	–	10007629	10007630	10007633	10007634	–	–
EL-1000-4G/SFP	–	–	–	–	–	–	10007815	–

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Others on request



Product	EL-1100-4AC	EL-1100-4DC
Description	Fast / gigabit Ethernet switch, unmanaged	
Article no.	050 xx 110000 xx	053 xx 110000 xx
Port type and amount	9 or 17 Ports in total; 1 x 1000BASE-SX/LX Ports: SC or BIDI-SC 8 or 16 x 10/100-BASE-TX Ports: RJ45	17 Ports in total; 1 x 1000 Base-SX/LX Ports: SC or BIDI-SC 16 x 10/100-BASE-TX Ports: RJ45
LEDs / interfaces		
Status LEDs	Ports (green/yellow)/Power (green)	
Failure relay (load capacity)	—	30 VDC (1 A)
Connector	6 pin terminal	
Fiber type / range / budget		
Twisted pair	0 m – 100 m (Cat5a or similar)	
POF 980 / 1000 μm (180 dB / km)	—	
HCS 200 / 230 μm (8 dB / km)	—	
Multimode 50 / 125 μm (1 dB / km)	0 m – 550 m, optical budget 7.5 dB with 850 nm	
Multimode 62.5 / 125 μm (1 dB / km)	0 m – 275 m, optical budget 7.5 dB with 850 nm	
Singlemode 9 / 125 μm (0.3 dB / km)	0 m – 10 km, optical budget 10.5 dB with 1310 nm (other distances on request)	
Supply		
Power supply	230 VAC / 50 Hz	12 – 60 VDC
Power consumption	13.5 watt, 60 mA	
Permissible ambient conditions		
Operating temperature	-20 °C – +60 °C	
Constructive design		
Dimensions (W x H x D)	42 mm x 176 mm (incl. connector) x 108 mm	
Assembly	DIN rail	
Weight	9-Port: 550 g, 17-Port: 600 g	
IP protection class	IP 20	
Housing	Stainless steel, powder coated	
Technical approvals		
Basis	CE	
Security for industrial control equipment	DIN EN 62368-1: 2014 + AC:2015	
Shipment/accessories		
Shipment	Device, terminal block, DIN rail clip, operating instructions	
Accessories (order separately)	patch cables	

SAP no.	MM/SC	SM/SC	SM/SC / BIDI-A
EL-1100-4AC - 8 x 100 TX / 1 x 1000 FX	10007834	10007836	10007673
EL-1100-4AC - 16 x 100 TX / 1 x 1000 FX	10007835	10007837	10007674
EL-1100-4DC - 16 x 100 TX / 1 x 1000 FX	10008731	—	—

Others on request





Product	EL-100-2MA	EL-1000-4GM
Description	Fast Ethernet switch, managed	Gigabit Ethernet switch, managed
Article no.	04420001000 x 000 xxx	0510 x 10 xxxx
Port type and amount	8 Ports in total, max. 4 x 100BASE-FX Ports: ST or SC, max. 8 x 10/100BASE-TX Ports: RJ45	Max. 10 Ports in total, max. 2 x 1000BASE-SX/LX Ports: SC or SFP, max. 8 x 10/100/1000BASE-TX Ports: RJ45
LEDs/interfaces		
Status LEDs	Failure (red)/Ports (green/yellow)/Power (green)/Ring (green)	
Failure relay (load capacity)	24 VDC [1A] / 60 VDC [0.3 A]	
Connector	4 pin terminal (redundant supply)/ 4 pin terminal (2 x fault relay)/USB/Sub-DB9	6 pin terminal (redundant supply, fault relay), USB
Fiber type/range/budget		
Twisted pair	0 m – 100 m (Cat5e)	0 m – 100 m (Cat 6)
Multimode 50/125 µm (1 dB/km)	0 m – 5 km, optical budget 13 dB with 1300 nm	0 m – 550 m, optical budget 7.5 dB with 850 nm
Multimode 62.5/125 µm (1 dB/km)	0 m – 5 km, optical budget 13 dB with 1300 nm	0 m – 275 m, optical budget 7.5 dB with 850 nm
Singlemode 9/125 µm (0.3 dB/km)	0 m – 30 km, optical budget 16 dB with 1310 nm (other distances on request)	0 m – 10 km, optical budget 10.5 dB with 1310 nm (other distances on request)
Supply		
Power supply	12 – 60 VDC (redundant)	
Power consumption at 24 VDC	8 watt, 330 mA	
Management		
Management	SNMP-Management / Web-Interface-Management	
Standards	IEEE 802.3 10BASE-T/IEEE802.3u 100BASE-T(X) and 100BASE-FX/IEEE802.3 Flow Control and Backpressure/ IEEE 802.1d Spanning Tree/IEEE 802.1w Rapid Spanning Tree/IEEE 802.1p Class of Service/IEEE 802.1Q VLAN-Tag	
Protocols	PROFINET class B, Netload class III	
MIB	RFC 1213 MIBII / RFC 1493 bridge MIB / RMON RFC 1757 / RFC 2674 VLAN MIB / RFC 1643 Ethernet as MIB / RFC 1215 Trap MIB private MIB for switch informations, ring, port alarm, TFTP firmware update, reset, port mirror, IP security management, IGMP management MIB	
Redundancy	Media redundancy protocol (MRP) according to IEC 62429-2 / rapid spanning tree protocol (RSTP)	
Other	SNTP for time synchronisation / IGMP v1 and query modus with 256 groups / DHCP client function / TFTP firmware, TFTP backup and recovery / ingress and egress bandwidth control	
Permissible ambient conditions		
Operating temperature	-40 °C – +55 °C	-40 °C – +70 °C
Constructive design		
Dimensions (W x H x D)	70 mm x 156 mm x 130 mm	30 mm x 165 mm x 101 mm
Assembly	DIN rail	
Weight	850 g	500 g
IP protection class	IP 20	
Housing	Stainless steel, powder coated	Stainless steel, powder coated
Technical approvals		
Basis	CE	
Security for industrial control equipment	UL 61010-1, CAN/CSA-C22.2 No. 61010-1-12 UL 61010-2-201, CSA-C22.2 No. 61010-2-201	

SAP no.	8TX	6TX/2FX	4TX/4FX	SAP no.	6TX/2FX	8TX/2FX
EL-100-2MA/RJ45	10007222	—	—	EL-1000-4GM/MM/SC	—	10007875
EL-100-2MA/MM/SC	—	10007218	10007229	EL-1000-4GM/SM/SC	—	10007876
EL-100-2MA/SM/SC	—	10007219	10007226	EL-1000-4GM/SFP	10007877	—

Others on request



PRODUCT MATRIX PE-LIGHT

	General		Application area		Ports		Splice box	Power supply	Temperature range	Transmission speed	Redundancy	Physics		Other	Technical approvals	Catalog	
	Product name	Media converter Switch	Pole (min. 100 mm inside diameter) Pole (min. 120 mm inside diameter)	Max. number RJ45 Max. number FX	Max. number pigtails	230 VAC Wide temperature range -30 °C/ +60 °C	Fast Ethernet (100 MBit/s) Gigabit Ethernet (1000 MBit/s)	Ring (RSTP) / Ring (MRP) POE (Power source / PSE) POE+ (Power source / PSE) POE++ (Power source / PSE)	IP protection class	Dimensions in mm (W x H x D)	CE	Page					
Passive																	
Pole junction box passive	PEL-P		●	0	0	12		●						IP 54	82 x 369 x 84	●	34
Media converter																	
Pole junction box active fast Ethernet	PEL-M PEL-M2	●	● —	1	1	12	●	●	●					IP 54	82 x 369 x 84 100 x 370 x 96	●	35
Pole junction box active fast Ethernet PoE	PEL-M PEL-M2	●	● —	1	1	12	●	●	●		●	●		IP 54	82 x 369 x 84 100 x 370 x 96	●	35
Pole junction box active gigabit Ethernet	PEL-M PEL-M2	●	● —	1	1	12	●	●	●	●				IP 54	82 x 369 x 84 100 x 370 x 96	●	36
Pole junction box active gigabit Ethernet PoE	PEL-M PEL-M2	●	● —	1	1	12	●	●	●	●	●	●		IP 54	82 x 369 x 84 100 x 370 x 96	●	36
Managed switch																	
Pole junction box active gigabit Ethernet switch	PEL-S PEL-S2	●	● —	4 (M12)	2	12	●	●		●	●	●	●	120 W IP 42	82 x 369 x 84 100 x 370 x 96	●	37

EXPLANATION ICONS: see page 24



Product	PEL-P
Description	Pole junction box passive
Article no.	0685 0000 0000 x 02
Port type and amount	1 x splice box, 1 x splice comb (max. 12 x crimp splice protection)*
Interfaces	
Fuse	—
Terminals	—
Connector above	1 x M20x1.5 dummy plug / 1 x M20x1.5 shared cable bushing
Power supply model	—
Fiber type /range/ budget	
Twisted pair	—
Multimode 50/ 125 µm (1 dB/km)	—
Multimode 62.5/ 125 µm (1 dB/km)	—
Singlemode 9/ 125 µm (0.3 dB/km)	—
Supply	
Power supply	—
Power consumption bei 230 VAC	—
Permissible ambient conditions	
Operating temperature	-30 °C – +60 °C
Constructive design	
Dimensions (W x H x D)	82 mm x 369 mm x 84 mm
Assembly	Hook mounting in lantern pole
Weight	1,080g
IP protection class	IP 54
Housing	Polycarbonate (PC GF 6-7)
Technical approvals	
Basis	CE
Requirements for light poles	DIN EN 40-5, DIN 49778
Shipment /accessories	
Shipment	Pole junction box wit splice tray, pigtails, LWL-coupling with mount

*Splice comb for shrink splice protection on request



Pole junction box passive

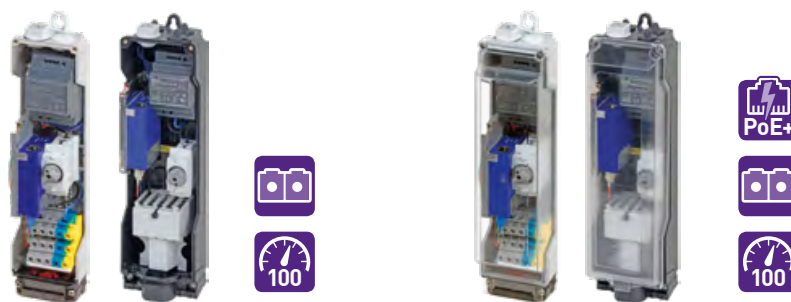


Pole junction box active



SAP no.	MM-50-OM3	MM-62.5-OM1	SM-09-OS2
PEL-P /Passive	10007403	10007404	10007400

Others on request



Product	PEL-M / PEL-M2	PEL-M / PEL-M2
Description	Pole junction box active fast Ethernet	Pole junction box active fast Ethernet PoE+
Article no.	068 x F141 1130 x 02	068 x F241 1130 x 02
Port type and amount	1 x 10/100BASE-TX: RJ45 1 x 100BASE-FX-MM or SM: SC 1 x splice box, 1 x splice comb (max. 12 x crimp splice protection)*	1 x 10/100BASE-TX: RJ45 PoE+: 802.3at/Power over Ethernet Plus 1 x 100BASE-FX-MM or SM: SC 1 x splice box, 1 x splice comb (max. 12 x crimp splice protection)*
Interfaces		
Fuse	4 A	6 A
Terminals	1.5 mm ² – 25 mm ²	
Connector above	1 x M20x1.5 dummy plug / 1 x M20x1.5 shared cable bushing	
Power supply model	24 V / 2.5 A	48 V / 1.25 A
Fiber type / range / budget		
Twisted pair	0 m – 100 m (Cat5e)	
Multimode 50/125 µm (1 dB/km)	0 m – 5 km, optical budget 13 dB with 1300 nm	
Multimode 62.5/125 µm (1 dB/km)	0 m – 5 km, optical budget 13 dB with 1300 nm	
Singlemode 9/125 µm (0.3 dB/km)	0 m – 30 km, optical budget 16 dB with 1310 nm	
Supply		
Power supply	230 VAC / 50 Hz – 60 Hz	
Power consumption bei 230 VAC	2.5 watt	3 watt + PoE+
Permissible ambient conditions		
Operating temperature	-30 °C – +60 °C	
Constructive design		
Dimensions (W x H x D)	PEL-M: 82 mm x 369 mm x 84 mm, PEL-M2: 100 mm x 370 mm x 96 mm	
Assembly	Hook mounting in lantern pole	
Weight	1,080 g (without media converter)	
IP protection class	IP 54	
Housing	Polycarbonate (PC GF 6-7)	
Technical approvals		
Basis	CE	
Requirements for light poles	DIN EN 40-5, DIN 49778	
Shipment/accessories		
Shipment	Pole junction box wit splice tray, terminal, fuse, power supply and media converter	
Accessories (order separately)	Patch cables, connecting cables, etc.	

*Splice comb for shrink splice protection on request

SAP no.	MM-50-0M3	MM-50-0M4	MM-62,5-0M1	SM-09-0S2
PEL-M / Active FE	10007406	—	10007407	10007405
PEL-M / Active FE-PoE+	10007458	—	—	10007459
PEL-M2 / Active FE	10008710	10008712	10008714	10008715
PEL-M2 / Active FE-PoE+	10008711	10008713	—	10008716

Others on request

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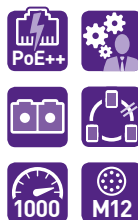
Product	PEL-M / PEL-M2	PEL-M / PEL-M2
Description	Pole junction box active gigabit Ethernet	Pole junction box active gigabit Ethernet PoE+
Article no.	068 x F341 1130 x 02	068 x F441 1130 x 02
Port type and amount	1 x 10/100/1000BASE-X: RJ45 1 x 1000BASE-SX or LX: SC 1 x splice box, 1 x splice comb (max. 12 x crimp splice protection)*	1 x 10/100/1000BASE-X: RJ45 PoE+: 802.3at/Power over Ethernet Plus 1 x 1000BASE-SX or LX: SC 1 x splice box, 1 x splice comb (max. 12 x crimp splice protection)*
Interfaces		
Fuse	4 A	6 A
Terminals	1.5 mm ² – 25 mm ²	
Connector above	1 x M20x1.5 dummy plug / 1 x M20x1.5 shared cable bushing	
Power supply model	24 V / 2.5 A	48 V / 1.25 A
Fiber type / range / budget		
Twisted pair	0 m – 100 m (Cat 6)	
Multimode 50 / 125 μm (1 dB/km)	0 m – 550 m, optical budget 7.5 dB with 850 nm	
Multimode 62.5 / 125 μm (1 dB/km)	0 m – 275 m, optical budget 7.5 dB with 850 nm	
Singlemode 9 / 125 μm (0.3 dB/km)	0 m – 10 km, optical budget 10.5 dB with 1310 nm	
Supply		
Power supply	230 VAC / 50 Hz – 60 Hz	
Power consumption bei 230 VAC	3 watt	3 watt + PoE+
Permissible ambient conditions		
Operating temperature	-30 °C – +60 °C	
Constructive design		
Dimensions (W x H x D)	PEL-M: 82 mm x 369 mm x 84 mm, PEL-M2: 100 mm x 370 mm x 96 mm	
Assembly	Hook mounting in lantern pole	
Weight	1,080 g (without media converter)	
IP protection class	IP 54	
Housing	Polycarbonate (PC GF 6-7)	
Technical approvals		
Basis	CE	
Requirements for light poles	DIN EN 40-5, DIN 49778	
Shipment / accessories		
Shipment	Pole junction box wit splice tray, terminal, fuse, power supply and media converter	
Accessories (order separately)	Patch cables, connecting cables, etc.	

*Splice comb for shrink splice protection on request

SAP no.	MM-50-0M3	SM-09-0S2
PEL-M / Active GE	10007411	10007410
PEL-M / Active GE-PoE+	10007413	10007412
PEL-M2 / Active GE	10008717	10008719
PEL-M2 / Active GE-PoE+	10008718	10008720

Others
on request





Product	PEL-S / PEL-S2
Description	Pole junction box active gigabit managed Ethernet switch
Article no.	068 x F412 4110 x 04
Port type and amount	4 x 10/100/1000BASE-X: M12 PoE++: IEEE 802.3 af, class 1 to 3, Typ 1 / IEEE 802.3 at, class 4, Typ 2 / IEEE 802.3 bt, class 1 to 6, Typ 3 2 x 1000BASE-SX or LX: LC, 1 x splice box, 1 x splice comb (max. 12 x crimp splice protection)*

Signal LEDs / interfaces	
Pre-fuse	Max. 16 A
Fuses within pe-light S	Min. 40 A ² s, PoE-switch: 2 A, lamp: max. 8 A
Terminals power supply	1.5 mm ² – 16 mm ²
Terminals door contact / lamp connector	0.2 mm ² – 2.5 mm ²
Connector above	4 x M12 X-coded
Power supply model	50 VDC / 1.25 A

Fiber type / range / budget	
Twisted pair	0 m – 100 m (Cat5e)
Multimode 50/125 μm (1 dB/km)	0 m – 200 m, optical budget 5 dB with 850 nm
Multimode 62.5/125 μm (1 dB/km)	0 m – 100 m, optical budget 5 dB with 850 nm
Multimode 50/125 μm (0,3 dB/km)	0 m – 550 m, optical budget 11.5 dB with 1310 nm
Singlemode 9/125 μm (0,3 dB/km)	0 m – 10 km, optical budget 11.5 dB with 1310 nm

Supply	
Power supply	230 VAC / 50 Hz – 60 Hz
Power consumption bei 230 VAC	Max. 140 watt
Potential separation	4 kV / overvoltage category II

Permissible ambient conditions	
Operating temperature	-40 °C – +65 °C, at 30 °C with derating 3.5 W/Kelvin

Constructive design	
Dimensions (W x H x D)	PEL-S: 82 mm x 369 mm x 84 mm PEL-S2: 100 mm x 370 mm x 96 mm
Assembly	Hook mounting in lantern pole
Weight	1,560 g
IP protection class	IP 42
Housing	Polycarbonate (PC GF 6-7)

Technical approvals	
Basis	CE
Requirements for light poles	DIN EN 40-5, DIN 49778

Shipment/accessories	
Shipment	Pole junction box wit splice tray, terminal, fuse, power supply and gigabit Ethernet switch
Accessories (order separately)	Patch cables, connecting cables, etc.

SAP no.	MM-50-0M3	MM-62,5-0M1	SM-09-0S2
PEL-S / Active GE-PoE++ (850 nm)	10007676	10007677	—
PEL-S / Active GE-PoE++ (1310 nm)	10007838	—	10007675
PEL-S2 / Active GE-PoE++ (850 nm/200 mtr.)	10008721	—	—
PEL-S2 / Active GE-PoE++ (850 nm/100 mtr.)	—	10008722	—
PEL-S2 / Active GE-PoE++ (1310 nm/550 mtr.)	10008723	—	—

* Splice comb for shrink splice protection on request



PEL-S



PEL-S2



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Others on request

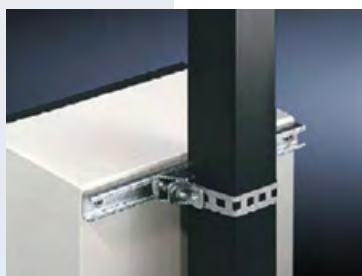
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The all-in-one solution
for video surveillance

The pe-light outdoor box connects IP surveillance cameras and/or wifi access points securely to the video server and combines power supply, Ethernet switch, wifi access point, surge protection and connection technology in one compact device.



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Furthermore, the outdoor box has an industrial design and offers user friendly installation. Round and square pole mounting sets are available on request that make installation significantly easy.

Professional video surveillance offers security and transparency.

However, it requires careful planning and a comprehensive approach. Apart from the modern IP camera, all other components must compatible and with each other.

Through the use of industry-standard and robust components from the eks portfolio a reliable function is guaranteed even under extreme conditions.

- » Suitable for outdoor applications
- » Customizable with media converter, switch, splice box, power supply, lightning protection, cable bushings etc. – according to your specifications
- » For the connection of IP surveillance cameras and/or wifi access points as well as the connection to a broadband fiber optic infrastructure
- » Round or square pole mounting possible
- » Boxes with different dimensions made from steel sheet, stainless steel or polyamide
- » Turnkey installation including cable
- » You save time during planning and installation

Please contact us!



You reach us via e-mail:

sales@eks-engel.de

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PRODUCT MATRIX E-COM

	General		Application area			Ports			Power supply	Temperature range	Transmission speed		Redundancy		Physics	Protocol	Other	Technical approvals	Catalog
	Product name	Switch	DIN rail	19"	Max. total number	Max. number TX	Max. number FX			Fast Ethernet (100 Mbit/s)	Gigabit Ethernet (1000 Mbit/s)	Ring (RSTP)	Ring Redundancy	POE+ (Power source / PSE)	Ethernet	IP protection class	Dimensions in mm (W x H x D)	CE / UL	Page
Unmanaged																			
Gigabit Ethernet PoE switch	AMG350-4GAT-1C-1S-P120	●	●		7	5	2	48 – 56 VDC	-40 °C / +75 °C	●	●			●	●	IP 40	47 x 144 x 106	●/—	41
Managed																			
Gigabit Ethernet switch	AMG570-8G-3S	●	●		11	8	3	12 – 56 VDC	-40 °C / +75 °C	●	●	●	●		●	IP 40	59 x 156 x 123	●/—	42
Gigabit Ethernet PoE switch	AMG570-2GBT-4GAT-2G-3S-P300	●	●		11	8	3	48 – 56 VDC	-40 °C / +75 °C	●	●	●	●	●	●	IP 40	59 x 156 x 123	●/—	42
Gigabit Ethernet chassis switch	EC-24TX/4FX-M	●	●		28	24	4	100 – 240 VAC	-10 °C / +55 °C	●	●	●	●		●	IP 20	442 x 44 x 211	●/—	43
	EC-4TX/20+4FX-M	●	●		28	24	8	100 – 240 VAC	-10 °C / +65 °C	●	●	●	●		●	IP 20	440 x 44 x 220	●/●	43

EXPLANATION ICONS: see page 24



Product	AMG350-4GAT-1C-1S-P120
Description	Gigabit Ethernet PoE switch, unmanaged
Port type and amount	6 Ports in total, 4 x 10/100/1000Base-TX Ports: RJ45 with 802.3at 30 W PoE, 1 x 10/100/1000Base-TX RJ45 or 100/1000Base-FX SFP Combo Port, 1 x 100/1000Base-FX SFP Port
LEDs/interfaces	
Status LEDs	2 x Power SFP, Link/Activity, RJ45 Link/Activity, PoE, Alarm
Failure relay (load capacity)	24 V (1 A)
Connector	6 pin terminal (redundant supply/relay)
Fiber type / range / budget	
Twisted pair	0 m – 100 m (Cat 6)
Fiber optics / glass fiber	see SFPs (page 63 – 64)
Supply	
Power supply	48 – 56 VDC (redundant)
Power consumption	Max. 6 watt + PoE
Permissible ambient conditions	
Operating temperature	-40 °C – +75 °C
Constructive design	
Dimensions (W x H x D)	47 mm x 144 mm x 106 mm
Assembly	Wall mounting or DIN rail
Weight	1,000 g
IP protection class	IP 40
Housing	Anodized aluminium
Technical approvals	
Basis	CE
Shipment/accessories	
Shipment	Device, terminal block, DIN rail clip, operating instructions
Accessories (order separately)	Power supplies, patch cables, SFPs



SAP no.	
AMG350-4GAT-1C-1S-P120	10008724

Others
on request



Product	AMG570-8G-3S	AMG570-2GBT-4GAT-2G-3S-P300
Description	Gigabit Ethernet switch, managed	
Port type and amount	11 Ports in total, 8 x 10/100/1000Base-TX Ports: RJ45, 3 x 100/1000/2.5G Base-FX Ports: SFP	11 Ports in total, 2 x 10/100/1000Base-TX Ports: RJ45 with 802.3bt 60/90 W PoE, 4 x 10/100/1000Base-TX Ports: RJ45 with 802.3at 30 W PoE, 2 x 10/100/1000Base-TX Ports: RJ45, 3 x 100/1000/2.5G Base-FX SFP Ports
LEDs/interfaces		
Status LEDs	2 x Power, Fault, SFP Link/Activity, RJ45 Link/Activity, PoE (only PoE model)	
Failure relay (load capacity)	24 VDC (1 A)	
Connector	6 pin terminal (redundant supply/relay)	
Fiber type/range/budget		
Twisted pair	0 m – 100 m [Cat 6]	
Fiber optics/glass fiber	see SFPs (page 63 – 64)	
Supply		
Power supply	12 – 56 VDC (redundant)	48 – 56 VDC (redundant)
Power consumption	Max. 10 watt	Max. 10 watt + PoE
Management		
Management	SNMP-Management / Web-Interface-Management / Telnet / SSH v2.0 / CLI	
MIB	Standard MIB / Private MIB	
Standards	IEEE 802.3 / IEEE 802.3u / IEEE 802.3x / IEEE 802.3ad / IEEE 802.1D / 802.1s / 802.1w / 802.1p / 802.1Q / 802.1X / 802.3az	
L2 Features	Port based VLAN / Private VLAN / Voice VLAN / IGMP Snooping v1/v2/v3 / MLD Snooping / MVR / MRP / GVRP VLAN Registration / LACP Dynamic/Static Trunk / Class of Service	
Redundancy	IEEE 802.1D-STP / IEEE 802.1s-MSTP / IEEE 802.1w-RSTP / ERPS (G.8032)	
Other	Layer 3 Features: Static Routing: Interfaces 8 Max, Routes 32 Max, DHCP Server (IPv4), WRR (Weighted Round Robin) / SP (Strict Scheduling Priority) / Hybrid Priority, Ingress Rate Limit / Egress Rate Limit / Static, Dynamic, MAC address filtering / DHCP client Option82 / TFTP, HTTP Software Update / SNMP Client / IPv6 / LLDP	
Permissible ambient conditions		
Operating temperature	-40 °C – +75 °C	
Constructive design		
Dimensions (W x H x D)	59 mm x 156 mm x 123 mm	
Assembly	Wall mounting or DIN rail	
Weight	1,150 g	
IP protection class	IP 40	
Housing	Anodized aluminium	
Technical approvals		
Basis	CE	
Shipment/accessories		
Shipment	Device, terminal block, DIN rail clip, operating instructions	
Accessories (order separately)	Power supplies, patch cables, SFPs	

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SAP no.	
AMG570-8G-3S	10008725
AMG570-2GBT-4GAT-2G-3S-P300	10008726

Others on request



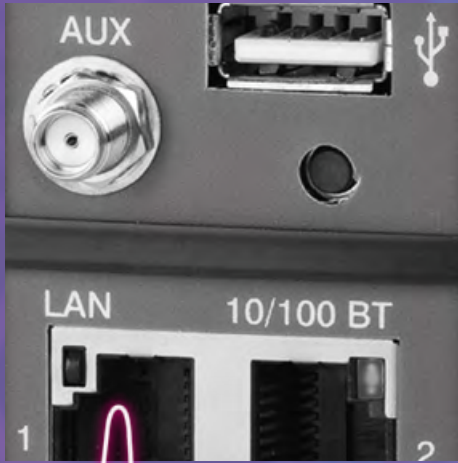
Product	EC-24TX / 4FX-M	EC-4TX / 20+4FX-M
Description	Gigabit Ethernet chassis switch, managed	
Article no.	261000902	271000901E
Port type and amount	28 Ports in total, 24 x 10/100/1000BASE-TX Ports: RJ45, 4 x 100/1000BASE-SX/LX/SFP Ports: Mini-GBIC	28 Ports in total, 4 x 1000BASE-X Ports: RJ45/SFP Combo Ports, 4 x 10GBASE-X/SFP Ports: Mini-GBIC, 20 x 100/1000BASE-SX/LX/SFP Ports: Mini-GBIC
LEDs / interfaces		
Status LEDs	Failure (red)/Ports (green/yellow)/System (green)/Ring master (green)/Loop Detection (red)	Power supply (green), Ports (green/yellow)
Fiber type / range / budget		
Twisted pair	0 m – 100 m (Cat 6)	
Fiber optics / glass fiber	see SFPs (page 63 – 64)	
Supply		
Power supply	100 – 240 VAC, 50 – 60 Hz	100 – 240 VAC, 50 – 60 Hz, 48 – 60 VDC
Power consumption at 230 VAC	18 watt	21.5 watt
Management		
Management	SNMP-Management / Web-Interface-Management / CLI	
MIB	Standard MIB / Private MIB	
Standards	IEEE 802.3 / IEEE802.3u / IEEE 802.3x / IEEE 802.1D / 802.1w / 802.1p / 802.1Q / 802.1X / 802.3ad / 802.3az	
L2 Features	256 VLAN groups / port based VLAN / GVRP per port / IGMP snooping v1 / v2 / v3 / MLD snooping / storm control: broadcast, multicast, unknown unicast / Link Aggregation	256 VLAN groups / Port+MAC based VLAN / GVRP per port / IGMP snooping v1 / v2 / v3 / MLD snooping / storm control: broadcast, multicast, unknown unicast / Link Aggregation
Redundancy	IEEE 802.1D-STP / IEEE 802.1s-MSTP / IEEE 802.1w-RSTP / X-Ring Pro (20 ms)	IEEE 802.1D-STP / IEEE 802.1s-MSTP / IEEE 802.1w-RSTP / ITU-T G.8032 Ethernet Ring Protection Switching (50 ms)
Other	WRR (Weighted Round Robin) / SP (Strict Scheduling Priority) / Ingress Rate Limit / Egress Rate Limit / Static, Dynamic, MAC address filtering / DHCP Client Option82 / TFTP, HTTP Software Update / SNMP Client / IPv6 / LLDP / Jumbo Frames	WRR (Weighted Round Robin) / SP (Strict Scheduling Priority) / Ingress Rate Limit / Egress Rate Limit / Static, Dynamic, MAC address filtering / DHCP Client Option82 / Radius+ TACACS Authentication / MVR / IPv6 / LLDP / Jumbo Frames
Permissible ambient conditions		
Operating temperature	-10 °C – +55 °C	-10 °C – +65 °C
Constructive design		
Dimensions (W x H x D)	442 mm x 44 mm x 211 mm	440 mm x 44 mm x 220 mm
Assembly	19" mounting	
Weight	ca. 4,000 g	ca. 3,320 g
IP protection class	IP 20	
Housing	Metal	
Technical approvals		
Basis	CE, FCC class A	
Security for industrial control equipment	–	UL (CSA 22.2, NO 60950-1 & UL60950-1) CB (IEC60950-1)
Shipment/accessories		
Shipment	Device, rackmount kit, operating instructions	
Accessories (order separately)	Patch cables, SFPs	

SAP no.	
EC-24TX/4FX-M / GE chassis switch, managed	10007495
EC-4TX/20+4FX-M / GE chassis switch, managed	10007687

Others on request



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The portfolio offers safe, simple and robust products for the connection of industrial machines and systems.

The systems are characterized by industrial features such as wide temperature range and approvals, and include remote maintenance solutions, routers, Ethernet extenders and VPN concentrators.



ROUTER & ETHERNET EXTENDER

THE COMMON APPLICATION AREAS:

- Traffic control systems
- Energy detection and distribution
- Water and waste water treatment

THE PREDOMINANT BRANCHES:

- Energy
- Transport
- Manufacturing automation
- Infrastructure

YOUR ADVANTAGES AND BENEFITS:

- Compact housings
- Easy installation and commissioning
- High planning reliability due to modular housing concepts

PRODUCT MATRIX IPL & RAS **M2Me**

Product name	General		Application area		Ports					Power supply	Temperature range	Other			Technical approvals	Catalog			
	VPN Router	Remote maintenance system	DIN rail	WAN: Ethernet	WAN: cellular (-HG: 3G+, -LE: 4G)	Wi-Fi: 2.4 - 5 GHz (Access Point and Client)	LAN: Ethernet 10 - 100 MBit/s	Serial link RS232 / RS485	USB link (PLC connection, data logger)	Wide temperature range -40 °C/ +70 °C	M2Me solution integrated	GPS option (with ANT405)	2 x power supply	2 x sim card holders	IP protection class	Dimensions in mm (W x H x D)	CE / UL	Page	
Industrial VPN router																			
Industrial router	IPL-C-100 IPL-C-220 IPL-C(W)-400	●	●		1	— — (1)	1 2 4	— ● —	— 1 1	12 - 24 VDC 12 - 48 VDC 12 - 48 VDC	●	*	— ● ●	— ● ●	— ● ●	IP 31 IP 20 IP 20	37 x 120 x 88 47 x 135 x 115 47 x 135 x 115	●/● ●/— ●/—	47
	IPL-E(W)-100 IPL-E(W)-220 IPL-E(W)-400	●	●	1		(1)	1 2 4	— ● —	— 1 1	12 - 24 VDC 12 - 48 VDC 12 - 48 VDC	●	*	— ● ●	— ● —	— ● IP 20	IP 31 IP 20 IP 20	37 x 120 x 88 47 x 135 x 115 47 x 135 x 115	●/● ●/— ●/—	47
Machine access box																			
Remote maintenance system + M2Me software	RAS-E-100 RAS-C-100	●	●	●	1	— — 1	1			12 - 24 VDC	●	●				IP 20	37 x 120 x 88	●/●	48
	RAS-EC(W)-220	●	●	●	1	1 (1)	2	●	1	12 - 48 VDC	●	●	●	●	●	IP 20	47 x 135 x 115	●/—	48
	RAS-E-400 RAS-EW-400 RAS-ECW-400	●	●	●	1	— — 1	1 1 1	4	1	1	12 - 48 VDC	●	●	●	●	— — ●	IP 20	47 x 135 x 115	●/—
* can be retrofitted																			

LEGEND

GENERAL



CE label



UL label



RoHS label



Wide temperature range



5 years warranty



Made in Germany

PRODUCT SPECIFIC



WAN (Ethernet)



WAN Cellular (LTE)



Wi-Fi



SHDSL



Serial RS232



Serial RS485



Security (Firewall, VPN)



M2Me



Product	IPL-C-100 / IPL-C-220 / IPL-C(W)-400	IPL-E(W)-100 / IPL-E(W)-220 / IPL-E(W)-400
Description	Industrial VPN router	
WAN 1 / WAN 2	4G / optional: Wi-Fi or Ethernet	Ethernet / optional: 4G or Wi-Fi
WAN interfaces		
Ethernet	RJ45	
LTE	2G/3G/4G LTE worldwide	
Wi-Fi	Client 2.4 und 5 GHz, 802.11 a/b/g/n and Super AG, antenna connector Female RP SMA	
LAN interfaces		
Ethernet	RJ45, 1-4 ports 10/100 MBit/s	
Serial port	Optional: RS232: RJ45, RS485: 2 pin, 9,600 up to 115,200 Bit/s	
Wi-Fi	Optional: Access Point 2.4 and 5 GHz	
Routing / management		
IP routing	Routing tables, static routing, RIP or OSPF; DNAT, SNAT or NAT 1:1 WAN interface: DHCP client or Fixed IP, LAN interface: DHCP server	
DNS	WAN interface: compatible with DYNDNS, No-IP or ETIC-DNS, LAN interface: Relay & DNS server	
Management	MIB 2 and SNMP v1/2c/3	
Configuration	WEB server	
Security		
Firewall	Stateful Packet Inspection (SPI: 50 rules), filtering of IP and ports	
VPN tunnel	OpenVPN (TLS/SSL), IPSEC, L2TP/IPSEC, PPTP, Shared Key or X.509 certificate, Encryption: 3DES & AES, authentication: MD5 & SHA-1 to SHA-512, up to 10 VPN tunnel	
Internal report	Time stamp, events: link, reboot, alarms	
Alarms	Digital input: e-mail, SMS, SNMP-trap, digital output: power outage, user port	
Redundancies	VRRP protocol RFC 3768	
Supply		
Power supply	Nominal 12 – 48 VDC (min. 10 – max. 60 VDC), all IPL-X-100 nominal: 12 – 24 VDC (min. 10 – max. 30 VDC)	
Power consumption at 24 VDC	IPL-ECW: 8 watt, all others: 5 watt	
Permissible ambient conditions		
Operating temperature	-40 °C – +70 °C	
Constructive design		
Dimensions (W x H x D)	IPL-X-100: 37 mm x 120 mm x 88 mm, all others: 47 mm x 135 mm x 115 mm	
Assembly	DIN rail	
Weight	500 g – 650 g	
IP protection class	IPL-X-100: IP 31, all others: IP 20	
Housing	Metal	
Technical approvals		
Basis	CE	
Security for industrial control equipment	IPL-X-100: UL 62368-1, CSA C22.2 NO. 62368-1-14	
Shipment/accessories		
Shipment	Device, terminal block, DIN rail clip, operating instructions	
Accessories (order separately)	Power supplies, patch cables, antennas	

SAP no.	100	W-100	220	400	W-400
IPL-C	10007767	—	10007813	10007768	10008126
IPL-E	10007748	10007764	10008324	10007780	10007769

Others
on request





Product	RAS-E-100 / RAS-C-100	RAS-EC(W)-220
Description	Remote maintenance system + M2Me software	
WAN 1 / WAN 2	RAS-E: Ethernet, RAS-C: 4G LTE worldwide / —	Ethernet / RAS-EC: 4G LTE worldwide, RAS-ECW: Wi-Fi
WAN interfaces		
Ethernet	RJ45: 10/100 MBit/s	
LTE	RAS-C/EC/ECW: 1 x 2G/3G/4G-LTE worldwide	
Wi-Fi	—	RAS-ECW: Client 2.4 and 5 GHz, 802.11 a/b/g/n and Super AG, antenna connection female RP SMA
LAN interfaces		
Ethernet	RJ45, 1 port 10/100 MBit/s	RJ45, 2 ports 10/100 MBit/s
Serial port	—	RS232: RJ45, RS485: 2 pin; 9,600 up to 115,200 Bit/s
Wi-Fi	—	RAS-ECW: Access Point 2.4 and 5 GHz
Routing / management		
IP Routing	Routing tables, static routing, RIP or OSPF; DNAT, SNAT or NAT 1:1 WAN interface: DHCP client or Fixed IP, LAN interface: DHCP server	
DNS	WAN interface: compatible with DYNDNS, No-IP or ETIC-DNS, LAN interface: Relay & DNS server	
Management / configuration	MIB 2 and SNMP v1/2c/3 / WEB server	
Security		
Firewall	Stateful Packet Inspection (SPI: 50 rules), filtering of IP and ports	
VPN tunnel	OpenVPN (TLS/SSL), IPSEC, L2TP/IPSEC, PPTP, Shared Key or X.509 certificate, Encryption: 3DES & AES, authentication: MD5 & SHA-1 to SHA-512, up to 10 VPN tunnel	
Internal report	Time stamp, events: Link, reboot, alarms	
Alarms	Digital input: e-mail, SMS, SNMP-trap, digital output: power outage, user port	
Redundancies	VRRP protocol RFC 3768	
M2Me solution		
User	Up to 100 remote users with secure VPN tunnel connection service	
Security	Customizable LAN machine network with access rights	
Supply		
Power supply	Nominal 12 – 48 VDC (min. 10 – max. 60 VDC), all RAS-X-100 nominal: 12 – 24 VDC (min. 10 – max. 30 VDC)	
Power consumption at 24 VDC	RAS-ECW: 8 watt, all others: 5 watt	
Permissible ambient conditions		
Operating temperature	-40 °C – +70 °C	
Constructive design		
Dimensions (W x H x D)	37 mm x 120 mm x 88 mm	47 mm x 135 mm x 115 mm
Assembly / weight	DIN rail / 500 g – 650 g	
IP protection class / housing	IP 20 / metal	
Technical approvals		
Basis	CE	
Security for industrial control equipment	UL 62368-1, CSA C22.2 NO. 62368-1-14	—
Shipment / accessories		
Shipment	Device, terminal block, DIN rail clip, operating instructions	
Accessories (order separately)	Power supplies, patch cables, antennas	

SAP no.	100	C-220	CW-220
RAS-C	10007761	—	—
RAS-E	10007770	10007919	10008043

Others on request

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Product	RAS-E-400 / RAS-EW-400 / RAS-ECW-400
Description	Remote maintenance system + M2Me software
WAN 1 / WAN 2	Ethernet / RAS-ECW: 4G LTE worldwide, RAS-EW/ECW: Wi-Fi
WAN interfaces	
Ethernet	4 x RJ45: 10/100 MBit/s
LTE	RAS-ECW: 1 x 2G/3G/4G-LTE worldwide
Wi-Fi	RAS-ECW: Client 2.4 and 5 GHz, 802.11 a/b/g/n and Super AG, antenna connection female RP SMA
LAN interfaces	
Ethernet	RJ45, 4 ports 10/100 MBit/s
Serial port	—
Wi-Fi	RAS-EW/ECW: Access Point 2.4 and 5 GHz
Routing / management	
IP Routing	Routing tables, static routing, RIP or OSPF; DNAT, SNAT or NAT 1:1 WAN interface: DHCP client or Fixed IP, LAN interface: DHCP server
DNS	WAN interface: compatible with DYNDNS, No-IP or ETIC-DNS, LAN interface: Relay & DNS server
Management / configuration	MIB 2 und SNMP v1/2c/3 / WEB server
Security	
Firewall	Stateful Packet Inspection (SPI: 50 rules), filtering of IP and ports
VPN tunnel	OpenVPN (TLS/SSL), IPSEC, L2TP/IPSEC, PPTP, Shared Key or X.509 certificate, Encryption: 3DES & AES, authentication: MD5 & SHA-1 to SHA-512, up to 10 VPN tunnel
Internal report	Time stamp, events: Link, reboot, alarms
Alarms	Digital input: e-mail, SMS, SNMP-trap, digital output: power outage, user port
Redundancies	VRRP protocol RFC 3768
M2Me solution	
User	Up to 100 remote users with secure VPN tunnel connection service
Security	Customizable LAN machine network with access rights
Supply	
Power supply	12 – 48 VDC (min. 10 – max. 60 VDC)
Power consumption at 24 VDC	RAS-ECW: 8 watt, all others: 5 watt
Permissible ambient conditions	
Operating temperature	-40 °C – +70 °C
Constructive design	
Dimensions (W x H x D)	47 mm x 135 mm x 115 mm
Assembly / weight	DIN rail / 500 g – 650 g
IP protection class / housing	IP 20 / metal
Technical approvals	
Basis	CE
Shipment/accessories	
Shipment	Device, terminal block, DIN rail clip, operating instructions
Accessories (order separately)	Power supplies, patch cables, antennas



SAP no.	400	W-400	CW-400
RAS-E	10007771	10007913	10007914

 Others
on request

PRODUCT MATRIX XSLAN

	General		Application area		Ports		Power supply		Temperature range		Physics		Functions										Other		Technical approvals		Catalog
	Product name	SHDSL point-to-point	SHDSL concentrator	DIN rail	19"	Number SHDSL	Number Ethernet ports 10 / 100BT	Serial port RS232 / RS485	Wide temperature range -40 °C / +70 °C	Max. data rate in MBit / s	2 power supplies	Galvanic isolation	SHDSL line aggregation	"Plug & Play" installation	Configuration / diagnosis via web server	SNMP administration	IP routing, QoS diffserv	VLAN (up to 60)	By-Pass (optional)	RSTP	Auto-negotiation (STU-C / STU-R)	IP protection class	Dimensions in mm (W x H x D)	CE	Page		
Ethernet extender	XSLAN-1100	●	●			1 1		10 - 30 VDC	●	15	●			●	●	●	●	●	0	●	●	IP 31	37 x 120 x 88	●	51		
	XSLAN-1220	●	●			1 2	1/1	10 - 60 VDC	●	15	●	*		●	●	●	●	●	0	●	●	IP 20	47 x 136 x 142	●	51		
	XSLAN-1400	●	●			1 4		10 - 60 VDC	●	15	●	●		●	●	●	●	●	0	●	●	IP 20	47 x 136 x 142	●	51		
	XSLAN-2400		●	●		2 4		10 - 60 VDC	●	30	●	●	●	●	●	●	●	●	1	●	●	IP 20	47 x 136 x 142	●	52		
	XSLAN-4200		●	●		4 2		10 - 60 VDC	●	60	●	●	●	●	●	●	●	●	1	●	●	IP 20	47 x 136 x 142	●	52		
	XSRACK-1260		●	●		12 6		110 / 230 VAC	-20 °C / +55 °C	60	●	●	●	●	●	●	●	●	1	●	●	IP 20	435 x 50 x 280	●	53		

* only the serial interfaces are not galvanically isolated

EXPLANATION ICONS: see page 46



Product	XSLAN-1100		XSLAN-1220			XSLAN-1400		
Description	Ethernet extender							
SHDSL ports (802.3ah, 2BaseTL)	1							
SHDSL latency	2 ms between the Ethernet ports of 2 SHDSL switches (Ethernet frame of 100 B at 5.7 MBit/s)							
Other interfaces								
Ethernet ports (RJ45, 10/100 MBit/s)	1		2			4		
Serial port RS232/RS485	0 / 0		1 / 1			0 / 0		
Digital input/output	Input: 0 < 1 V and 1 > 3 V, output: voltage / max. current: 54 VDC / 0.5 A							
Cable / range / data rate								
Data rate in MBit/s	192 kBit/s	1.15	2.3	5.7	6.7	10	12	15
Range (0.9 mm diameter)	13 km	8 km	6 km	3.7 km	2.5 km	1.5 km	1 km	0.7 km
Range (0.4 mm diameter)	7 km	4 km	3 km	2 km	1.3 km	8.9 km	0.6 km	0.4 km
Routing / management								
SNMP	SNMP v2, IF-MIB IP-MIB, BRIDGE-MIB							
IP routing	IP routing between LAN and SHDSL, NAT routing, port forwarding, 25 static routes, RIP V1 and V2, adress translation							
System and configuration								
Configuration	Webserver (configuration and diagnosis)							
Date and time	NTP client and server							
LOG	Last 300 events, syslog							
Security								
VLAN	Up to 60 VLANs, Loop VPN							
Redundancy	Rapid Spanning Tree Protokoll (RSTP)							
Supply								
Power supply	10 – 30 VDC (nominal: 12 – 24 VDC)		10 – 60 VDC (nominal: 12 – 48 VDC)			10 – 60 VDC (nominal: 12 – 48 VDC)		
Power consumption at 24 VDC	< 2 watt					5 watt		
Permissible ambient conditions								
Operating temperature	-40 °C – +70 °C							
Constructive design								
Dimensions (W x H x D)	37 mm x 120 mm x 88 mm			47 mm x 136 mm x 142 mm				
Assembly	DIN rail							
Weight	500 g – 750 g							
IP protection class	IP 31			IP 20				
Housing	Metal							
Technical approvals								
Basis	CE							
Shipment/accessories								
Shipment	Device, terminal block, DIN rail clip, operating instructions							
Accessories (order separately)	Power supplies, patch cables							

SAP no.	1100	1220	1400
XSLAN	10007752	10008173	10007749

Others
on request





Product	XSLAN-2400		XSLAN-4200					
Description	Ethernet extender							
SHDSL ports (802.3ah, 2BaseTL)	2		4					
SHDSL latency	2 ms between the Ethernet ports of 2 SHDSL switches (Ethernet frame of 100 B at 5.7 MBit/s)							
Other interfaces								
Ethernet ports (RJ45, 10/100 MBit/s)	4		2					
Serial port RS232/RS485	0 / 0							
Digital input/output	Input: 0 < 1 V and 1 > 3 V, output: voltage / max. current: 54 VDC / 0.5 A							
Cable / range / data rate								
Data rate in MBit/s	192 kBit/s	1.15	2.3	5.7	6.7	10	12	15
Range (0.9 mm diameter)	13 km	8 km	6 km	3.7 km	2.5 km	1.5 km	1 km	0.7 km
Range (0.4 mm diameter)	7 km	4 km	3 km	2 km	1.3 km	8.9 km	0.6 km	0.4 km
Routing / management								
SNMP	SNMP v2, IF-MIB IP-MIB, BRIDGE-MIB							
IP routing	IP routing between LAN and SHDSL, NAT routing, port forwarding, 25 static routes, RIP V1 and V2, adress translation							
System and configuration								
Configuration	Webserver (configuration and diagnosis)							
Date and time	NTP client and server							
LOG	Last 300 events, syslog							
Security								
VLAN	Up to 60 VLANs, Loop VPN							
Redundancy	Rapid Spanning Tree Protokoll (RSTP)							
Supply								
Power supply	10 – 60 VDC (nominal: 12 – 48 VDC)							
Power consumption at 24 VDC	6 watt							
Permissible ambient conditions								
Operating temperature	-40 °C – +70 °C							
Constructive design								
Dimensions (W x H x D)	47 mm x 136 mm x 142 mm							
Assembly	DIN rail							
Weight	500 g – 750 g							
IP protection class	IP 20							
Housing	Metal							
Technical approvals								
Basis	CE							
Shipment / accessories								
Shipment	Device, terminal block, DIN rail clip, operating instructions							
Accessories (order separately)	Power supplies, patch cables							

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SAP no.	2400	2400 BP	4200
XSLAN	10007750	10007920	10007751

Others on request

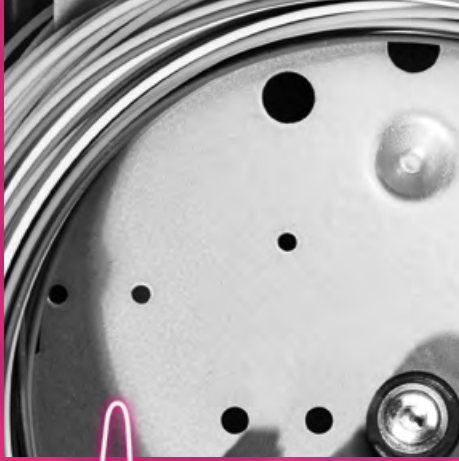


Product	XSRACK-1260							
Description	Ethernet extender							
SHDSL ports (802.3ah, 2BaseTL)	12							
SHDSL latency	2 ms between the Ethernet ports of 2 SHDSL switches (Ethernet frame of 100 B at 5.7 MBit/s)							
Other interfaces								
Ethernet ports (RJ45, 10/100 MBit/s)	6							
Serial port RS232/RS485	0 / 0							
Digital input/output	–							
Cable / range / data rate								
Data rate in MBit/s	192 kBit/s	1.15	2.3	5.7	6.7	10	12	15
Range (0.9 mm diameter)	13 km	8 km	6 km	3.7 km	2.5 km	1.5 km	1 km	0.7 km
Range (0.4 mm diameter)	7 km	4 km	3 km	2 km	1.3 km	8.9 km	0.6 km	0.4 km
Routing / management								
SNMP	SNMP v2, IF-MIB IP-MIB, BRIDGE-MIB							
IP routing	Multicast and broadcast filtering, static routes, RIP V2							
System and configuration								
Configuration	Webserver (configuration and diagnosis)							
Date and time	NTP client and server							
LOG	Last 300 events, syslog							
Security								
VLAN	Up to 60 VLANs, Loop VPN							
Redundancy	Rapid Spanning Tree Protokoll (RSTP)							
Supply								
Power supply	110 / 230 VAC, redundant							
Power consumption at 24 VDC	30 watt							
Permissible ambient conditions								
Operating temperature	-20 °C – +55 °C							
Constructive design								
Dimensions (W x H x D)	435 mm x 50 mm x 280 mm							
Assembly	19" mounting							
Weight	3,500 g							
IP protection class	IP 20							
Housing	Metal							
Technical approvals								
Basis	CE							
Shipment/accessories								
Shipment	Device, power supplies, operating instructions							
Accessories (order separately)	Patch cables							

SAP no.	1260
XSRACK	1008727

Others
on request





PASSIVES

We produce high-quality and robust splice boxes in different dimensions and types as well as for all common couplings. All splice boxes are ready for splicing and due to their flexible mounting options they guarantee an easy and time-saving installation.

Additionally, with FIMP-XL-Hybrid we offer a hybrid splice box that combines copper and glass fiber in one single device. It can not only be used for data transmission but is also suitable for the installation on spots that are difficult to access, indoor as well as outdoor.

In addition, we develop product- and application-specific solutions that perfectly meet the requirements of our customers.

THE COMMON APPLICATION AREAS:

- Automation, e.g. manufacturing, buildings and tunnels
- Security applications such as SCADA, ELA and control applications

THE PREDOMINANT BRANCHES:

- Process automation / process control engineering
- Building automation
- Traffic control technology / tunnel automation

YOUR ADVANTAGES AND BENEFITS:

- Ultra-compact construction
- Easy mounting
- High planning reliability through uniform housing concept
- Ready for splicing
- Can be combined with MPO

PRODUCT MATRIX PASSIVES

	General	Application area		Ports			Standard					Other	Technical approvals	Catalog
	Product name	DIN rail	Device according to DIN 43880	Max. total number pigtails	Max. number TX	Max. number FX	OM1	OM3	OM4	OS2	CAT 6a	Dimensions in mm (W x H x D)	CE	Page
DIN rail mounted junction box														
Industrial mini patch panel	FMP-XS	●		8		4	●	●	●	●		30 x 54 x 21	●	57
Splicebox according to DIN 43880	FIMP-REG	●	●	8		4	●	●	●	●		107 x 90 x 80	●	57
Industrial compact splicebox	FIMP-S	●		12		6	●	●	●	●		35 x 120 x 145	●	58
	FIMP-M	●		12		6	●	●	●	●		60 x 100 x 115	●	58
	FIMP-EX	●		12		6	●	●	●	●		60 x 100 x 115	●	58
	FIMP-XL	●		24		12	●	●	●	●		71 x 137 x 137	●	59
Industrial compact splicebox and patch panel	FIMP-XL-Hybrid	●		12	6	6	●	●	●	●		71 x 137 x 137	●	59
Industrial compact splicebox	FIMP-XLE	●		48		24	●	●	●	●		140 x 137 x 137	●	59
Industrial patch panel RJ45	CIMP-M	●		0	4						●	60 x 100 x 105	●	60
	CIMP-XL	●		0	12						●	71 x 137 x 126	●	60
19" splicebox / splicebox for wall mounting on request														

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LEGEND

GENERAL



CE label



RoHS label



Wide temperature range



5 years warranty



Made in Germany

PRODUCT SPECIFIC



FX – Fiber optics connection



TX – RJ45



Suitable for use in explosive areas zone 1 and 2



Product	FIMP-XS	FIMP-REG
Description	Industrial mini patch panel	Splicebox according to DIN 43880
Article no.	067000 xx xx	064000 xx xx -02
Port type and amount	Max. 2 couplings/max. 8 pigtails	Max. 3 couplings/max. 12 pigtails
Interfaces		
Couplings	Duplex ST/ST, duplex SC/SC, duplex ST/SC, LC quattro, E2000 low profile	Duplex ST, duplex SC and LC quattro
Pigtails	—	Length 2 m
Fibers	Multimode 50 µm or 62.5 µm, Singlemode (0° PC / 8° APC)	
Insertion loss	—	Multimode ≤ 0.3 dB, Singlemode: ≤ 0.2 dB
Cable inlet	—	1 x cable gland M20 (max.13.8 mm)
Permissible ambient conditions		
Operating temperature	-40 °C – +75 °C	-20 °C – +70 °C
Constructive design		
Dimensions (W x H x D)	30 mm x 54 mm x 21 mm	107 mm x 90 mm x 80 mm
Assembly	DIN rail	
Weight	80 g	260 g
Housing	Steel plate, powder coated	Polyamide, flame-retarding according to UL94 V-0
Technical approvals		
Basis	CE	
Shipment/accessories		
Shipment	Device, operating instructions	
Accessories (order separately)	Patch cables	



SAP no.	2 x SC/SC duplex	2 x ST/ST duplex	3 x SC/SC duplex	3 x ST/SC duplex	2 x LC quattro (metal)
FIMP-XS/MM	10007328	10007572	—	—	10007531
FIMP-XS/SM	10007475	10007612	—	—	—
FIMP-REG/MM/50 µm	—	—	10007233	10006732	10006733
FIMP-REG/MM/62.5 µm	—	—	10006734	10006736	10006737
FIMP-REG/SM/9 µm	—	—	10006738	10006739	10006740

Others
on request



Product	FIMP-S	FIMP-M	FIMP-EX
Description	Industrial compact splicebox		
Article no.	06300 x xx xx	06000 x xx xx	06001 x xx 96-04
Port type and amount	Max. 6 couplings / max. 12 pigtails		
Interfaces			
Couplings	Duplex ST, duplex SC, LC quattro, E2000 compact or low profile		Duplex ST or duplex SC
Pigtails	Length 2 m		
Fibers	Multimode 50 µm or 62.5 µm, Singlemode (0° PC / 8° APC)		
Insertion loss	Multimode ≤ 0.3 dB, Singlemode: ≤ 0.2 dB		
Cable inlet	2 x cable gland M20 (max.13.8 mm)		1 x cable gland M20 (max.13.8 mm)
Permissible ambient conditions			
Operating temperature	-20 °C – +70 °C		
Constructive design			
Dimensions (W x H x D)	35 mm x 120 mm x 145 mm	60 mm x 100 mm x 115 mm	
Assembly	DIN rail		
Weight	380 g	450 g	450 g
Housing	Steel plate, powder coated	Stainless steel, powder coated	
Technical approvals			
Basis	CE		
Shipment/accessories			
Shipment	Device, DIN rail clip, operating instructions		
Accessories (order separately)	Patch cables, on request with captive screws		

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SAP no.	6 x SC/SC duplex	6 x ST/SC duplex	3 x LC quattro (metal)	6 x E2000 compact	6 x E2000 8° APC compact
FIMP-S/MM/50 µm	10007055	10007024	10007026	10006966	—
FIMP-S/MM/62.5 µm	10007022	10007021	10007023	—	—
FIMP-S/SM/9 µm	10007246	10007027	10007029	—	—
FIMP-M/MM/50 µm	10002285	10002281	10002287	10002516	10006437
FIMP-M/MM/62.5 µm	10002195	10002180	10002201	10002522	—
FIMP-M/SM/9 µm	10002249	10002224	10002242	10002524	10002529
FIMP-EX/MM/50 µm	10002335	10002270	—	—	—
FIMP-EX/MM/62.5 µm	10002331	10006534	—	—	—
FIMP-EX/SM/9 µm	10002338	—	—	—	—

Others on request



Product	FIMP-XL	FIMP-XL-Hybrid	FIMP-XLE
Description	Industrial compact splicebox	Industrial compact splicebox and patch panel	Industrial compact splicebox
Article no.	06100 xxxx xxxx x	06200 xxxx xxxx x	061800 xxxxx xxxxx x
Port type and amount	Max. 12 couplings / max. 24 pigtails	Max. 6 couplings / max. 12 pigtails + 6 x RJ45 Cat6a	Max. 24 couplings / max. 48 pigtails
Interfaces			
Couplings	Duplex ST, duplex SC, LC quattro, E2000 compact or low profile		
Pigtails	Length 2 m		
Fibers	Multimode 50 µm or 62.5 µm, Singlemode (0° PC / 8° APC)		
Insertion loss	Multimode ≤ 0.3 dB, Singlemode: ≤ 0.2 dB		
Cable inlet	1 x cable gland M20 (max.13.8 mm), 1 x M25 (max. 21 mm)		
Permissible ambient conditions			
Operating temperature	-20 °C – +70 °C		
Constructive design			
Dimensions (W x H x D)	71 mm x 137 mm x 137 mm		140 mm x 137 mm x 137 mm
Assembly	DIN rail		
Weight	860 g		1,750 g
Housing	Stainless steel, powder coated		
Technical approvals			
Basis	CE		
Shipment/accessories			
Shipment	Device, DIN rail clip, operating instructions		
Accessories (order separately)	Patch cables, on request with captive screws		



SAP no.	12 x SC/SC duplex	12 x ST/SC duplex	6 x LC quattro (metal)	12 x E2000 compact
FIMP-XL / MM / 50 µm	10002626	10002470	10006549	10002671
FIMP-XL / MM / 62.5 µm	10002455	10002451	10006550	10002678
FIMP-XL / SM / 9 µm	10002590	10002456	10002585	10002680

SAP no.	6 x SC/SC duplex	6 x ST/SC duplex	3 x LC quattro (metal)
FIMP-XL-Hybrid / MM / 50 µm	10002694	10007336	—
FIMP-XL-Hybrid / SM / 9 µm	10002696	—	10002695

All Hybrid types with 6 x RJ45 CAT 6

SAP no.	24 x SC/SC duplex	24 x ST/SC duplex	12 x LC quattro (metal)
FIMP-XLE / MM / 50 µm	10007557	10007606	10007559
FIMP-XLE / MM / 62.5 µm	10007604	10007605	10007607
FIMP-XLE / SM / 9 µm	10007357	10007603	10007560

Others on request



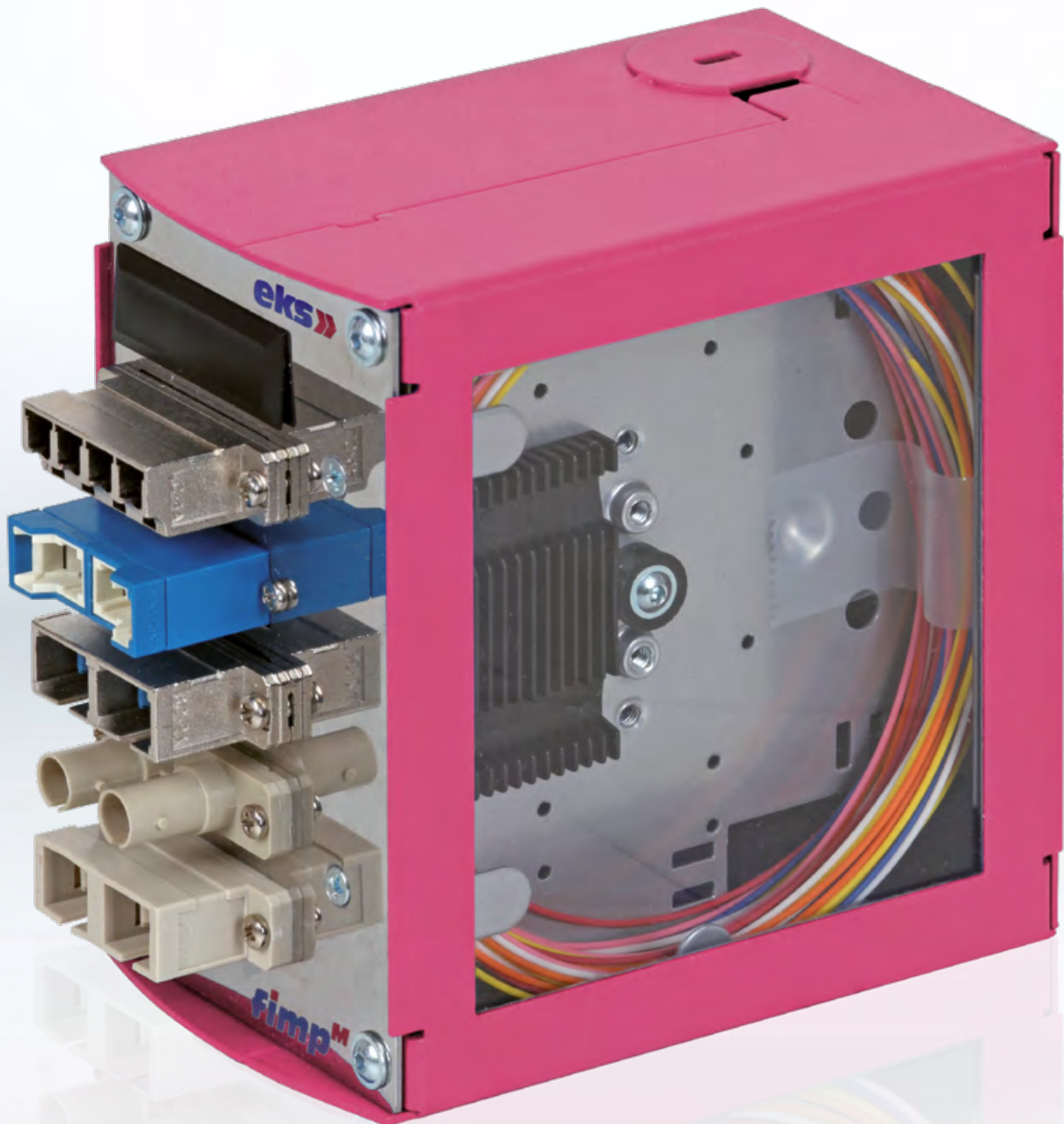
Product	CIMP-M	CIMP-XL
Description	Industrial patch panel RJ45	
Article no.	3602000 xxx	06120000 xxx
Port type and amount	Max. 4 RJ45 modules Cat 6a	Max. 12 RJ45 modules Cat 6a
Interfaces		
Couplings	RJ45 Cat 6a	
Permissible ambient conditions		
Operating temperature	-10 °C – +60 °C	
Constructive design		
Dimensions (W x H x D)	60 mm x 100 mm x 105 mm	71 mm x 137 mm x 126 mm
Assembly	DIN rail	
Weight	450g	860g
Housing	Stainless steel, powder coated	
Technical approvals		
Basis	CE	
Shipment/accessories		
Shipment	Device, accessories (cable gland, counter nut, multi cable grommets, cable tie, safety plugs, RJ45 module), DIN rail clip, operating instructions	
Accessories (order separately)	On request with captive screws	

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SAP no.	02 x RJ45	04 x RJ45	06 x RJ45	08 x RJ45	10 x RJ45	12 x RJ45
CIMP-M	10007608	10007318	—	—	—	—
CIMP-XL	—	10007465	10007466	10007467	10007468	10007469

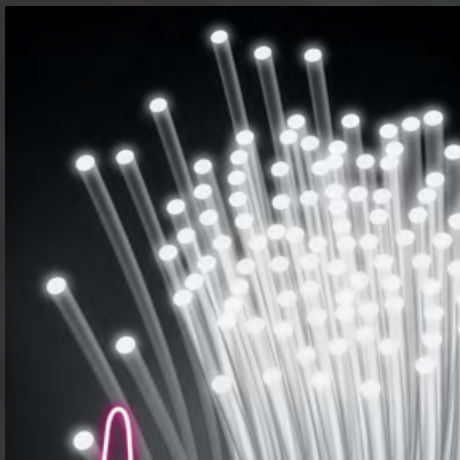
Others on request



Industrial compact splice box in the open view



This is an example of the equipment used to show the available plugs. The side panel with window is for demo purposes only.



As a manufacturer of high-quality electronic systems we offer additional accessories for our products.

OUR PORTFOLIO COVERS:

- Universal 19" carriers for vertical or horizontal mounting
- Splice trays, available also in 19" type
- Various fiber optics such as simplex, duplex and breakout cables or loose tube cables with rodent protection
- Patch cables
- Power supplies

ACCESSORIES

We also offer you individual cables, which we assemble and manufacture to your needs. Just talk to us about this.

All accessories are tested and controlled comprehensively before delivery.



Product	EKS-IRP-24V-010W	EKS-IRP-24V-020W	EKS-IRP-24V-040W
Description	Power supply		
Article no.	22201535	22201536	22201537
Interfaces			
Input voltage	Screw terminal, 3 pin		
Output voltage	Screw terminal, 3 pin		Screw terminal, 6 pin
Data input / output			
Input voltage	85 – 264 VAC, 120 – 370 VDC		
Input frequency	47 – 63 Hz		
Input current	0.21 A at 230 VAC	0.35 A at 230 VAC	0.7 A at 230 VAC
Output voltage	24 VDC		
Output current	0.42 A	1 A	1.7 A
Output power	10 watt	24 watt	40 watt
Permissible ambient conditions			
Operating temperature	-20 °C – +70 °C (power supply in the middle: derating starting at 50 °C)		
Constructive design			
Dimensions (W x H x D)	22.5 mm x 90 mm x 100 mm		40 mm x 90 mm x 100 mm
Assembly	DIN rail		
Weight	170 g	190 g	300 g
IP protection class	IP 20		
Housing	Plastic		
Technical approvals			
Basis	CE		
Security for industrial control equipment	UL508 / TÜV EN60950-1 audited		
Shipment/accessories			
Shipment	Device, DIN rail clip, operating instructions		
Accessories (order separately)	—		

SAP no.	10 watt	20 watt	40 watt
EKS-IRP-24V-xx	10004371	10004372	10004373

Others
on request

Product	EKS-IRP-48V-060W	EKS-IRP-48V-075W	EKS-IRP-48V-120W	EKS-IRP-48V-240W
Description	Power supply			
Article no.	22201540	22201532	22201528	22201527
Interfaces				
Input voltage	Screw terminal, 3 pin			
Output voltage	Screw terminal, 6 pin	Screw terminal, 4 pin		
Data input/output				
Input voltage	85 – 264 VAC, 120 – 370 VDC		88 – 132 / 176 – 264 VAC, 248 – 370 VDC	85 – 264 VAC, 120 – 370 VDC
Input frequency	47 – 63 Hz			
Input current	1 A at 230 VAC	0.96 A at 230 VAC	1.6 A at 230 VAC	0.96 A at 230 VAC
Output voltage	48 VDC			
Output current	1.25 A	1.6 A	2.5 A	5 A
Output power	60 watt	75 watt	120 watt	240 watt
Permissible ambient conditions				
Operating temperature	-20 °C – +70 °C (derating starting at 55 °C)	-10 °C – +60 °C (derating starting at 50 °C)		-10 °C – +70 °C (derating starting at 55 °C)
Constructive design				
Dimensions (W x H x D)	40 mm x 90 mm x 100 mm	55.5 mm x 125.2 mm x 100 mm	65.5 mm x 125.2 mm x 100 mm	125.5 mm x 125.2 mm x 100 mm
Assembly	DIN rail			
Weight	330 g	600 g	790 g	1,200 g
IP protection class	IP 20			
Housing	Plastic			
Technical approvals				
Basis	CE			
Security for industrial control equipment	UL508 / TÜV EN60950-1 audited			
Shipment/accessories				
Shipment	Device, DIN rail clip, operating instructions			
Accessories (order separately)	—			

SAP no.	60 watt	75 watt	120 watt	240 watt
EKS-IRP-48V-xx	10004376	10004369	10004365	10004364

Others
on request



Product	FE SFP/MM/Extended/2 km 100 MBit fast Ethernet SFP module/LC	FE SFP/SM/Extended/15 km 100 MBit fast Ethernet SFP module/LC	FE SFP/SM/Extended/40 km 100 MBit fast Ethernet SFP module/LC
Description	Fast Ethernet SFP module		
Article no.	0400301E	0400302E	0400303E
Fiber type / range / budget			
Twisted pair	—		
Multimode 50/125 μm (1 dB/km)	0 m – 2 km, optical budget 13 dB with 1300 nm	—	—
Multimode 62.5/125 μm (1 dB/km)	0 m – 2 km, optical budget 13 dB with 1300 nm	—	—
Singlemode 9/125 μm (0.3 dB/km)	—	0 m – 15 km, optical budget 13 dB with 1310 nm	0 m – 40 km, optical budget 29 dB with 1310 nm
Permissible ambient conditions			
Operating temperature	-40 °C – +85 °C		
Technical approvals			
Basis	CE		

SAP no.	MM/2 km	SM/15 km	SM/40 km	
FE SFP module	10001663	10001664	10001665	Others on request



Product	GB SFP/MM/Extended/850 nm/ 550 m gigabit SFP module/LC	GB SFP/MM/Extended/1300 nm/ 2 km gigabit SFP module/LC	GB SFP/SM/Extended/ 10 km gigabit SFP module/LC
Description	Gigabit SFP module		
Article no.	0400351E	0400352E	0400353E
Fiber type / range / budget			
Twisted pair	—		
Multimode 50/125 μm (1 dB/km)	0 m – 550 m, optical budget 7.5 dB with 850 nm	0 m – 2 km, optical budget 12 dB with 1300 nm	—
Multimode 62.5/125 μm (1 dB/km)	0 m – 275 m, optical budget 7.5 dB with 850 nm	0 m – 2 km, optical budget 12 dB with 1300 nm	—
Singlemode 9/125 μm (0.3 dB/km)	—	—	0 m – 10 km, optical budget 11.5 dB with 1310 nm
Permissible ambient conditions			
Operating temperature	-40 °C – +85 °C		
Technical approvals			
Basis	CE		

SAP no.	MM/550 m (850 nm)	MM/2 km (1300 nm)	SM/10 km (1310 nm)	
GE SFP module	10001667	10001668	10001670	Others on request



Product	GB SFP/SM/Extended/20 km gigabit SFP module/LC	GB SFP/SM/Extended/1310 nm/1550 nm/20 km gigabit SFP module/LC-BIDI-A
Description	Gigabit SFP module	
Article no.	0400356E	0400359E
Fiber type /range/budget		
Twisted pair	—	
Multimode 50/125 μm (1 dB/km)	—	
Multimode 62.5/125 μm (1 dB/km)	—	
Singlemode 9/125 μm (0.3 dB/km)	0 m – 20 km, optical budget 14 dB with 1310 nm	0 m – 20 km, optical budget 14 dB with 1310 nm / 1550 nm
Permissible ambient conditions		
Operating temperature	-40 °C – +85 °C	
Technical approvals		
Basis	CE	

SAP no.	SM/20 km (1310 nm)	SM/20 km BIDI-A	Others on request
GE SFP module	10007610	10007717	



Product	GB SFP/SM/Extended/1550 nm/1310 nm/20 km gigabit SFP module/LC-BIDI-B	GB SFP/10/100/1000Mbps gigabit SFP module/RJ45/Extended
Description	Gigabit SFP module	
Article no.	0400360E	0400355E
Fiber type /range/budget		
Twisted pair	—	0 m – 100 m (Cat6e)
Multimode 50/125 μm (1 dB/km)	—	
Multimode 62.5/125 μm (1 dB/km)	—	
Singlemode 9/125 μm (0.3 dB/km)	0 m – 20 km, optical budget 14 dB with 1550 nm / 1310 nm	—
Permissible ambient conditions		
Operating temperature	-40 °C – +85 °C	
Technical approvals		
Basis	CE	

SAP no.	SM/20 km BIDI-B	RJ45/100 m	Others on request
GE SFP module	10007718	10006972	



Product	Rack-19	DUAL-MOUNT
Description	Universal 19" DIN rail carrier	Dual mount kit
Article no.	1000000100-20	1000000200-22
Permissible ambient conditions		
Operating temperature	-40 °C – +75 °C	
Constructive design		
Dimensions (W x H x D)	88.1 mm x 482.6 mm x 210 mm	—
Assembly	19" rack	—
Material	Alu-zinc sheet metal	—
Shipment/accessories		
Shipment	Rack, angle set (depending on order), mounting material, operating instructions	—
Accessories (order separately)	3-HE Mounting kit / V2A grain 240 4-HE Mounting kit / V2A grain 240 5-HE Mounting kit / V2A grain 240	—

SAP no.	Rack-19	3-HE Mounting kit	4-HE Mounting kit	5-HE Mounting kit	DUAL-MOUNT
	10002491	10002492	10002493	10002494	10002782

Others on request

PATCH CABLES



Multimode			Length	SAP no.
Duplex patch cable MM-50	LC/LC	OM3	2 m	10133023
			3 m	10133033
		OM4	2 m	10133024
			3 m	10133034
	LC/SC	OM3	2 m	10132023
			3 m	10132033
		OM4	2 m	10132024
			3 m	10132034
	SC/SC	OM3	1 m	10122013
			2 m	10122023
			3 m	10122033
			5 m	10122053
OM4		1 m	10122014	
		2 m	10122024	
		3 m	10122034	

Singlemode			Length	SAP no.
Duplex patch cable SM-9	LC/LC	1 m	10133019	
		2 m	10133029	
		3 m	10133039	
		1 m	10132019	
	LC/SC	2 m	10132029	
		3 m	10132039	
		5 m	10132059	
		LC/ST	2 m	10131029
	3 m		10131039	
	SC/SC	1 m	10122019	
		2 m	10122029	
		3 m	10122039	
5 m		10122059		

M12 patch cable	Length	SAP no.
pe-light patch cable RJ45/M12 8-pin, x-coded, Kat. 6 shielded	2 m	10007783
	3 m	10007859
	5 m	10007858
	8 m	10007917
	10 m	10007680

Other patch cables on request

GLOSSARY

A

APC | *Angled Physical Contact*

Combination of bevel grinding and crowned polish for low-damping and reflection-free plugs, the fibers of which touch each other at their end faces and ensure a glass-glass transition.

B

BIDI | *Bidirectional*

Bidirectional data transmission

The attribute bidirectional means that a data transmission takes place in both directions from point to point.

C

Compact splice box

Ultra Compact box for orderly storage of several splice connections with mechanical strain relief, often with modular design for flexible intake of splice cassettes. Can be mounted on a DIN rail.

F

Fusion splice

Thermal splice produced by arcing, in contrast to the mechanical crimp splice.

I

Ingress protection

Standardized classification of electrical enclosures facilities relating to the protection of persons and the resistance to external influences. Each with two digits for fixed and aqueous interfering factors, larger numbers are indicating higher protection.

Example: IP 68 - dust-tight and protected against permanent immersion.

L

LC-Plug

Powerful small compact connector (SFF) with a ferrule made of ceramic or zirconia in the diameter of 1.25 mm, has a low insertion and high return loss. Suitable for single- and multimode fibers, applicable in simplex and duplex applications.

M

Multimode fiber (MM)

Fiber optic cable with relatively large core diameter for simultaneous guidance of several signal-transmitting modes, whose resulting runtime differences (mode dispersion) by means of a construction according to the gradient index profile must be balanced out. Not suitable for high bandwidth transmission and over great distances.

MPO | *Multipath Push-On*

Space-saving connector for up to 72 fibers with a ferrule made of ceramic or plastic in the diameter of 2.5 mm, has medium insertion and high return loss on. Used in conjunction with ribbon cables, available for coupling via APC or PC.

O

Optical budget

Difference between optical transmission power and reception sensitivity. For error-free data transmission, this must be greater than the damping factors occurring on the path (splices, connectors, fiber paths).

S

SC-Plug

Compact connector in square design for single- and multimode fibers, ceramic ferrule in the diameter of 2.5 mm, available as simplex and duplex version. Is characterized by low insertion loss and high return loss as well as automatic locking and anti-twist device.

SFP | *Small Form Factor Pluggable*

Compact, quickly exchangeable connector plug modules in the form of a transmitting-receiving unit for single- and multimode fibers. Application for the bridging of long fiber optic distances in the gigabit Ethernet range.

Singlemode fiber (SM)

Fiber optic cable with very small core diameter, which is intended to cause the spread of only a mode of the operating wavelength, and has very low damping values. Usually dispersion optimized for even better performance, usually 9 µm Diameter.

Splice

Non-disconnectable connection between two exact cut/plan broken optical fibers with lowest damping values. Manufactured by gluing, melting or crimping.

Splice box

Box for intaking any number of splice trays, forms the end of a fiber optic line, provides bushing plug for the incoming signals, the system secures the glass fibers against tensile strain.

Splice comb

Intake of spliced connections between the fiber ends arriving in the splice box and the proceeding pigtails stuck in the front panel.

Splice tray

Housing for the clear reception of up to 12 pairs of glass fiber ends and their reserve as well as the respective splice connections, which were inserted beforehand into a splice comb.

ST-Plug

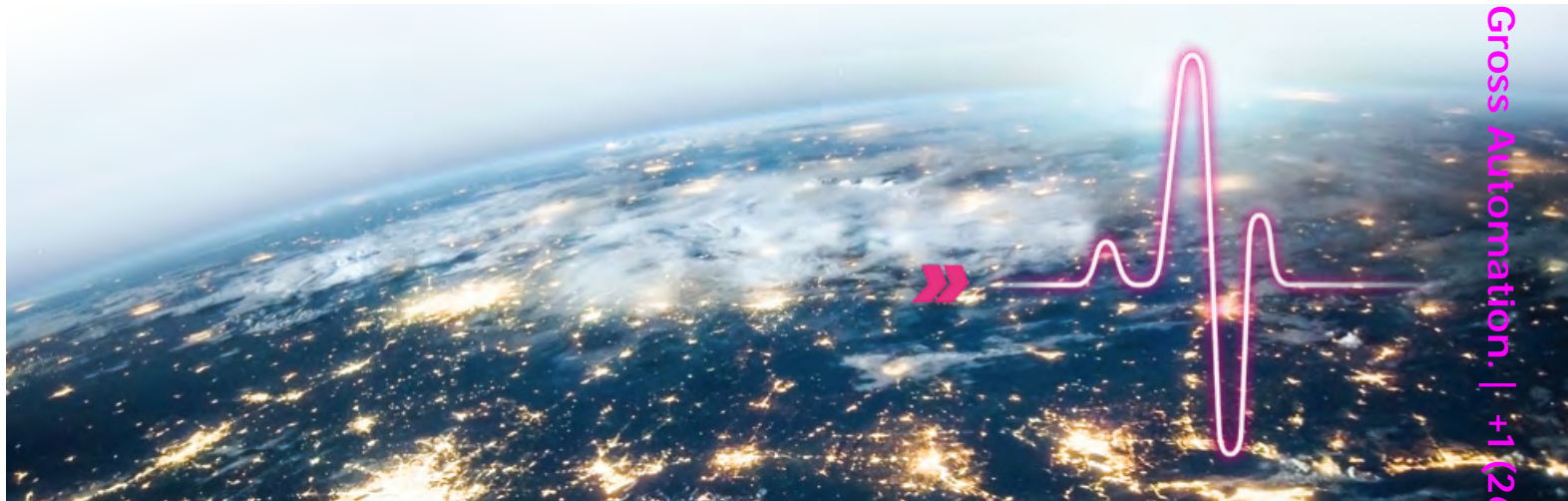
Widely used, inexpensive connector for single- and multimode fibers with a metal ferrule or ceramics with a diameter of 2.5 mm. Achieves optimized damping values due to spring-loaded contact surfaces in the plug, anti-twist protection and a low insertion loss and thus favours its use in patch cables.

W

WDM | *Wavelength Division Multiplexing*

Method for the parallel transmission of several signals of different wavelengths, the separation then takes place again by appropriate filters.

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