

PORTFOLIO
ENGLISH

INTERFACE

ANALOG/
DIGITAL

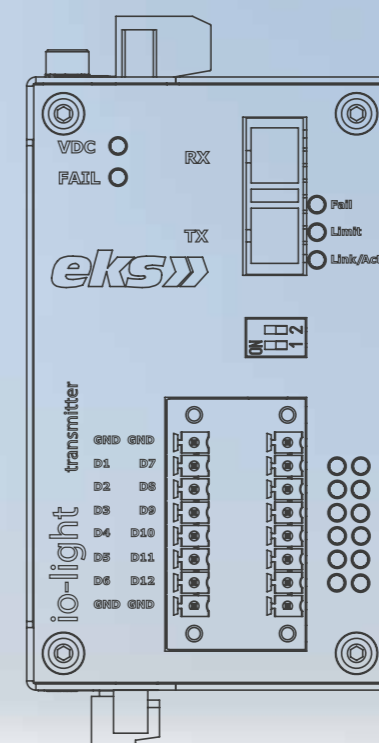
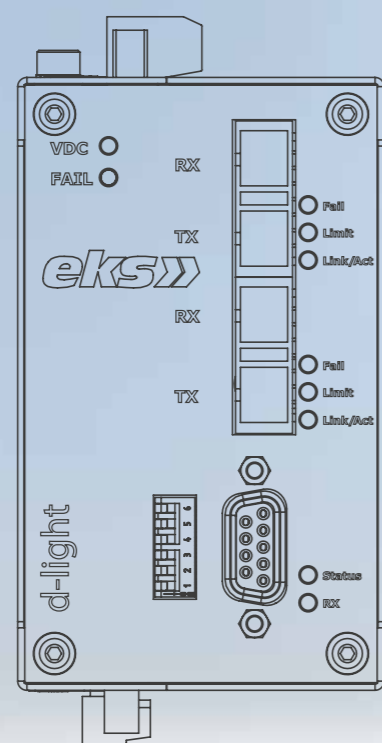




INTELLIGENT SOLUTIONS – engineered by eks

We are experts in industrial communication and we develop and produce high-performance electronic systems and modular devices that transmit data 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 since 1986 and not least because of that, we can call ourselves pioneers of modern communication.



INTERFACE

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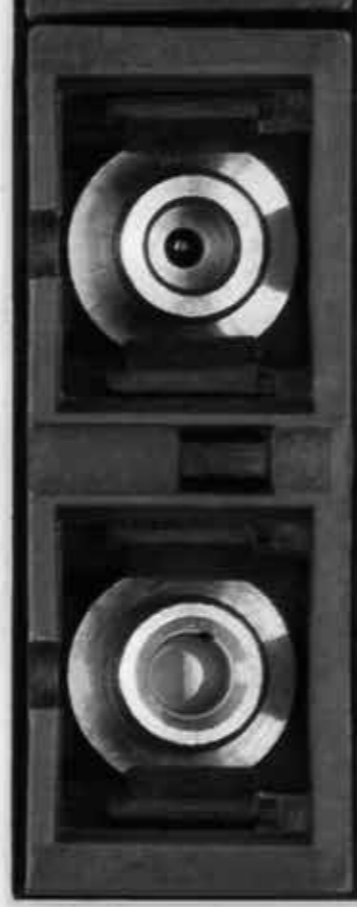
ANALOG/DIGITAL

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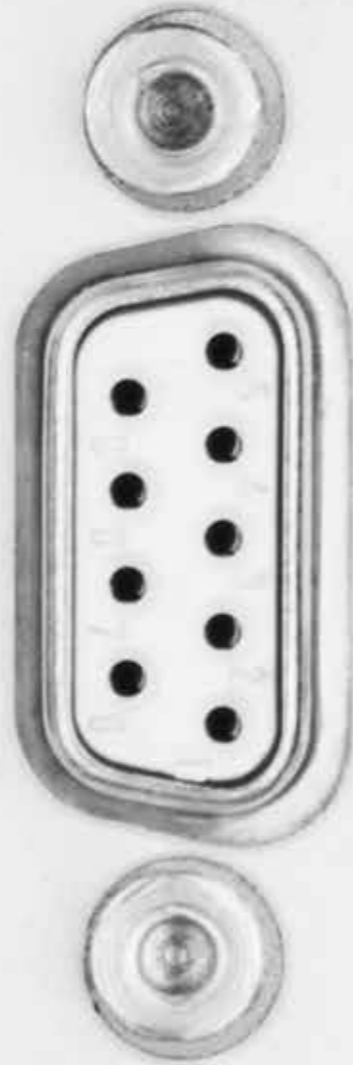
d-light

RX

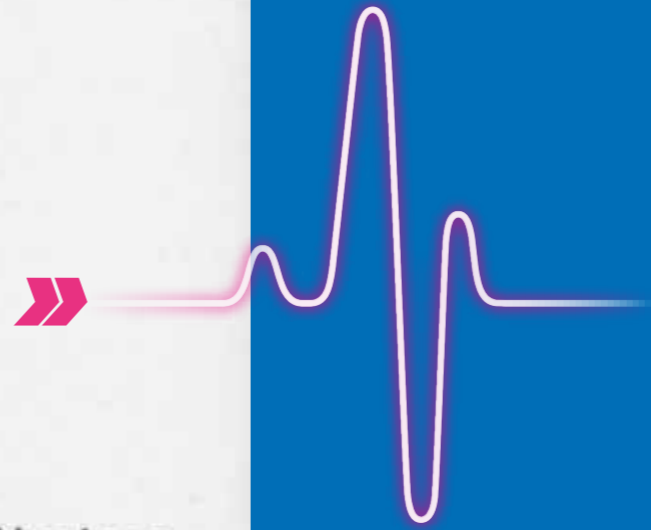
TX



- Fail
- Limit
- Link / Act



- Status
- RX



INTERFACE

We produce high performance FO systems for all common field busses and interfaces such as Profibus, CAN, MODBUS, MODNET, RS232, 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. We refine standards and develop product and application specific solutions that meet our customers needs.



DL485 / DL485-4W

RS485-FO-SYSTEM PROTOCOL TRANSPARENT

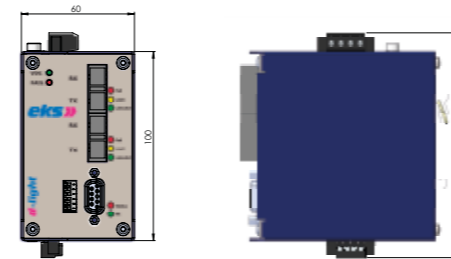
The fiber optic systems DL485 connect field bus systems with RS485 interfaces. Optical linking allows safe data transfer and is suitable for MODBUS, MODNET-1/SFB, BIT-BUS, SAIA-S-BUS and several manufacturer-specific systems.

The fiber optic systems DL485-4W connect field bus systems with RS485 four-wire interfaces.

With the help of this innovative system optical bus, star, tree and mixed structures are possible.

LEDs and potential-free contacts of a fault detector relay are able to signal defective states.

FiberView works similarly to a traffic light. If the "traffic light" is green, everything is fine. If the yellow LED lights, the budget is still tolerable, but already below a certain system reserve. Additionally to the LED, this pre-warning level is also signaled by a potential-free contact. If the "traffic light" turns red there is a serious error. fiber optic systems DL485 connect field bus systems with RS485 interfaces. Optical linking allows safe data transfer and is suitable for MODBUS, MODNET-1/SFB, BIT-BUS, SAIA-S-BUS and several manufacturer-specific systems.



Type	P-ST	H-ST	MM-ST	MM-SC	MM-SC/BIDI	SM-ST	SM-SC	SM-E2	SM-SC/BIDI
Article no. DL485	01000 6101	01000 6111	01000 6121	01000 6123	01000 6123-BIDI A 6123-BIDI B	01000 6131	01000 6133	01000 6135	01000 6133-BIDI A 6133-BIDI B
Article no. DL485-2x	01000 6151	01000 6162	01000 6171	01000 6173	01000 6173-BIDI	01000 6181	01000 6183	01000 6185	01000 6183-BIDI

Data rate	1200 Bit/s bis 3 MBit/s								
Transmission type	Half duplex								

Type	P-ST	H-ST	MM-ST	MM-SC	MM-SC/BIDI	SM-ST	SM-SC	SM-E2	SM-SC/BIDI
Article no. DL485-4W	01000 6601	01000 6611	01000 6621	01000 6623	01000 6623-BIDI A 6623-BIDI B	01000 6631	01000 6633	01000 6635	01000 6633-BIDI A 6633-BIDI B
Article no. DL485-4W-2x	01000 6651	01000 6662	01000 6671	01000 6673	01000 6673-BIDI	01000 6681	01000 6683	01000 6685	01000 6683-BIDI

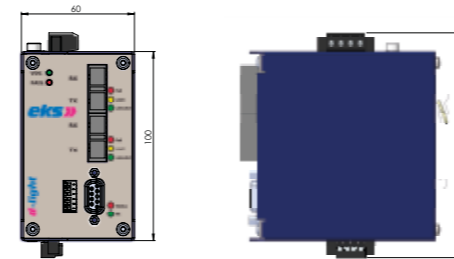
Data rate	1200 Bit/s bis 3 MBit/s								
Transmission type	2 x Half duplex								

FO-connector	ST	ST	ST	SC	SC	ST	SC	E-2000	SC
Fiber type	POF 980/1000 µm	HCS 200/230 µm	Multimode 62.5 (50)/125 µm			Singlemode 9/125 µm			
Optical budget	12 dB	12 dB	12 dB			16 dB			
FO range	50 m (180 dB/km)	200 m (8 dB/km)	5 km (1 dB/km)			30 km, others up to 100 km on request (0.3 dB/km)			
Wavelength	650 nm	850 nm	1310 nm		1310 nm 1550 nm	1310 nm		1310 nm 1550 nm	

Terminating resistor	Switchable: none or wave impedance (Rw + Rpd + Rpu)								
RS485 Cable length	1200 m (9.6–93.75 KBit/s), 250 m (500 KBit/s), 90 m (1.5 MBit/s)								
RS485 Connector	9-pole Sub-D female and 6-pole terminal								
Status-LEDs	Power supply (green) / Failure (red) / Data receive (green) / Status (red) / FiberView (red, yellow, green)								
Power supply	12–30 VDC, other voltages on request								
Power consumption	5 Watts, 200 mA (24 V)								
Potential separation	500 VDC (24 VDC <- RS485)								
Operating temperature	–40 °C – +70 °C (Multimode and Singlemode with ST or SC), –20 °C – +55 °C (all others)								
EMC	EN61000-6-2/EN55022 + A1 + A2 Class B								
Weight	570 g								
Dimensions	60 x 100 x 113 mm (60 x 120 x 113 mm incl. connector)								
Housing	Stainless steel, powder coated								



DL485-MBR



Type	P-ST	H-ST	MM-ST	MM-SC	MM-SC/BIDI	SM-ST	SM-SC	SM-E2	SM-SC/BIDI
Article no. DL485-MBR	01000 7951	01000 7962	01000 7971	01000 7973	01000 7973-BIDI	01000 7981	01000 7983	01000 7985	01000 7983-BIDI
F0-connector	ST	ST	ST	SC	SC	ST	SC	E-2000	SC
Fiber type	POF 980/1000 µm	HCS 200/230 µm	Multimode 62.5 (50) / 125 µm			Singlemode 9/125 µm			
Optical budget	12 dB	12 dB	12 dB			16 dB			
F0 range	50 m (180 dB/km)	200 m (8 dB/km)	5 km (1 dB/km)			30 km, others up to 100 km on request (0.3 dB/km)			
Wavelength	650 nm	850 nm	1310 nm		1310 nm 1550 nm	1310 nm			1310 nm 1550 nm
Data rate	9.6 KBit/s, 19.2 KBit/s, 38.4 KBit/s, 57.6 KBit/s oder 115.2 KBit/s								
Transmission type	Half duplex								
Terminating resistor	Switchable: none or wave impedance (Rw + Rpd + Rpu)								
RS485 Cable length	1200 m								
RS485 Connector	9-pole Sub-D female and 6-pole terminal								
Status-LEDs	Power supply (green) / Failure (red) / Data receive (green) / Status (red) / FiberView (red, yellow, green)								
Power supply	12-30 VDC, other voltages on request								
Power consumption	5 Watts, 200 mA [24 V]								
Potential separation	500 VDC [24 VDC <-> RS485]								
Operating temperature	-40 °C - +70 °C [Multimode and Singlemode with ST or SC], -20 °C - +55 °C [all others]								
EMC	EN61000-6-2/EN55022 + A1 + A2 Class B								
Weight	570 g								
Dimensions	H: 115 mm, B: 61 mm, T: 113 mm								
Housing	Stainless steel, powder coated								

MODBUS-FO- SYSTEM REDUNDANT

The fiber optic systems DL485-MBR secure the optical data transfer within MODBUS networks up to a data speed of 115,2 KBit/s. Our special multifunctional fiber optic system allows the construction of optical ring structures.

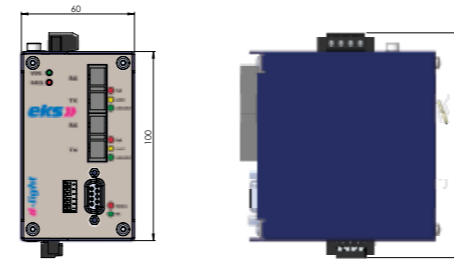
The system of this series is especially suitable for applications with strict safety-related requirements as for instance: process industry, tunnel ventilation systems and railway technology.

LEDs and potential-free contacts of a fault detector relay are able to signal defective states.

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DL485-PB / DL485-PBR



Type	P-ST	H-ST	MM-ST	MM-SC	MM-SC/BIDI	SM-ST	SM-SC	SM-E2	SM-SC/BIDI
Article no. DL485-PB	01000 6201	01000 6211	01000 6221	01000 6223	01000 6223-BIDI A 6223-BIDI B	01000 6231	01000 6233	01000 6235	01000 6233-BIDI A 6233-BIDI B
Article no. DL485-PB-2x	01000 6251	01000 6262	01000 6271	01000 6273	01000 6273-BIDI	01000 6281	01000 6283	01000 6285	01000 6283-BIDI
Type	P-ST	H-ST	MM-ST	MM-SC	MM-SC/BIDI	SM-ST	SM-SC	SM-E2	SM-SC/BIDI
Article no. DL485-PBR	01000 6351	01000 6362	01000 6371	01000 6373	01000 6373-BIDI	01000 6381	01000 6383	01000 6385	01000 6383-BIDI
FO-connector	ST	ST	ST	SC	SC	ST	SC	E-2000	SC
Fiber type	POF 980/1000 μm	HCS 200/230 μm	Multimode 62.5 (50)/125 μm			Singlemode 9/125 μm			
Optical budget	12 dB	12 dB	12 dB			16 dB			
FO range	50 m (180 dB/km)	200 m (8 dB/km)	5 km (1 dB/km)			30 km, others up to 100 km on request (0.3 dB/km)			
Wavelength	650 nm	850 nm	1310 nm		1310 nm 1550 nm	1310 nm			1310 nm 1550 nm
Data rate max.	12 MBit/s								
Transmission type	Half duplex								
Signal delay	RS485 <-> FO: < 3 T _{Bit} / Tx <-> Rx: 11 T _{Bit}								
Terminating resistor	Switchable: none or wave impedance (R _w + R _{pd} + R _{pu})								
RS485 Cable length	1200 m (9.6–187.5 KBit/s), 400 m (500 KBit/s), 200 m (1.5 MBit/s), 100 m (3 MBit/s–12 MBit/s)								
RS485 Connector	9-pole Sub-D female and 6-pole terminal								
Status-LEDs	Power supply (green) / Failure (red) / Data receive (green) / Status (red) / FiberView (red, yellow, green)								
Power supply	12–30 VDC, other voltages on request								
Power consumption	5 Watts, 200 mA (24 V)								
Potential separation	500 VDC (24 VDC <-> RS485)								
Operating temperature	–40 °C – +70 °C (Multimode and Singlemode with ST or SC), –20 °C – +55 °C (all others)								
EMC	EN61000-6-2/EN55022 + A1 + A2 Class B								
Weight	570 g								
Dimensions	60 x 100 x 113 mm (60 x 120 x 113 mm incl. connector)								
Housing	Stainless steel, powder coated								

PROFIBUS-FO- SYSTEM STANDARD REDUNDANT

The systems DL485-PB connect ProfiBus-field bus networks by fiber optics. With the help of this innovative system, optical bus, star, tree and mixed structures are possible.

The special multifunctional fiber optic system DL485-PBR also allows the construction of optical ring structures. The system of this series is especially suitable for applications with strict safety-related requirements as for instance: process industry, tunnel ventilation systems and railway technology.

LEDs and potential-free contacts of a fault detector relay are able to signal defective states.

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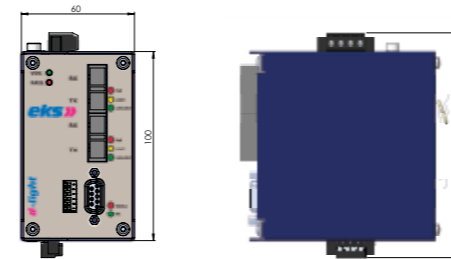
DL485-MBP / DL485-MBPR

MODBUS-PLUS-FO-SYSTEM

The fiber optic systems DL485-MBP connect a MODBUS-Plus interface to optical field bus networks. With the help of this innovative system optical bus, star, tree and mixed structures are possible.

The special multifunctional fiber optic system DL485-MBPR also allows the construction of optical ring structures.

LEDs and potential-free contacts (optional for DL485-MBP) of a fault detector relay are able to signal defective states.



Type	P-ST	H-ST	MM-ST	MM-SC	MM-SC/BIDI	SM-ST	SM-SC	SM-E2	SM-SC/BIDI
Article no. DL485-MBP	01000 6401	01000 6411	01000 6421	01000 6423	01000 6423-BIDI A 6423-BIDI B	01000 6431	01000 6433	01000 6435	01000 6433-BIDI A 6433-BIDI B
Article no. DL485-MBP-2x	01000 6451	01000 6462	01000 6471	01000 6473	01000 6473-BIDI	01000 6481	01000 6483	01000 6485	01000 6483-BIDI
Type	P-ST	H-ST	MM-ST	MM-SC	MM-SC/BIDI	SM-ST	SM-SC	SM-E2	SM-SC/BIDI
Article no. DL485-MBPR	01000 8551	01000 8562	01000 8571	01000 8573	01000 8573-BIDI	01000 8581	01000 8583	01000 8585	01000 8583-BIDI
FO-connector	ST	ST	ST	SC	SC	ST	SC	E-2000	SC
Fiber type	POF 980/1000 µm	HCS 200/230 µm	Multimode 62.5 (50)/125 µm			Singlemode 9/125 µm			
Optical budget	12 dB	12 dB	12 dB			16 dB			
FO range	50 m (180 dB/km)	200 m (8 dB/km)	5 km (1 dB/km)			30 km, others up to 100 km on request (0.3 dB/km)			
Wavelength	650 nm	850 nm	1310 nm	1310 nm 1550 nm	1310 nm	1310 nm	1310 nm	1310 nm	1310 nm 1550 nm
Data rate max.	1 MBit/s								
Transmission type	Half duplex								
Signal delay	MODBUS Plus Interface <-> FO: < 400 ns / Tx <-> Rx: 500 ns MBPR: MODBUS Plus Interface <-> FO: < 1 µs								
Terminating resistor	Acc. to MODBUS Plus specification there are no terminating resistors								
RS485 Cable length	50 m								
RS485 Connector	9-pole Sub-D female and 6-pole terminal								
Status-LEDs	Power supply (green) / Data (yellow) / Status (red)								
Power supply	12-30 VDC, other voltages on request								
Power consumption	5 Watts, 200 mA (24 V)								
Potential separation	500 VDC (24 VDC <-> RS485)								
Operating temperature	-40 °C - +70 °C (Multimode and Singlemode with ST or SC), -20 °C - +55 °C (all others)								
EMC	EN61000-6-2/EN55022 + A1 + A2 Class B								
Weight	570 g								
Dimensions	60 x 100 x 113 mm (60 x 120 x 113 mm incl. connector)								
Housing	Stainless steel, powder coated								



DL CAN/DL CAN-R

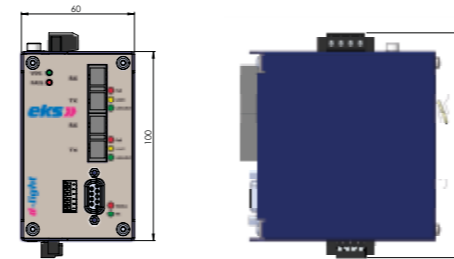
CAN-FO-SYSTEM PROTOCOL TRANSPARENT

The systems DL CAN connect CAN field bus networks (e.g. CAN, CANopen, DeviceNet) via fiber optics. With the help of this innovative system, optical bus, star, tree and mixed structures are possible.

The special multifunctional fiber optic system DL CAN-R also allows the construction of optical ring structures.

LEDs and potential-free contacts of a fault detector relay are able to signal defective states.

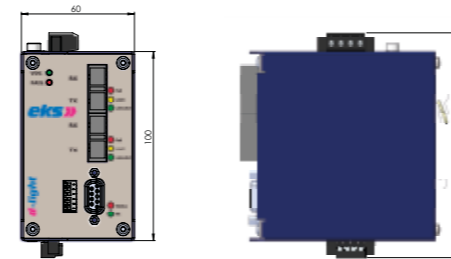
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Type	P-ST	H-ST	MM-ST	MM-SC	MM-SC/BIDI	SM-ST	SM-SC	SM-E2	SM-SC/BIDI
Article no. DL CAN	01000 7401-FV	01000 7411-FV	01000 7421-FV	01000 7423-FV	01000 7423-BIDI A 7423-BIDI B	01000 7431-FV	01000 7433-FV	01000 7435	01000 7433-BIDI A 7433-BIDI B
Article no. DL CAN-2x	01000 7451-FV	01000 7462-FV	01000 7471-FV	01000 7473-FV	01000 7473-BIDI	01000 7481-FV	01000 7483-FV	01000 7485	01000 7483-BIDI
Type	P-ST	H-ST	MM-ST	MM-SC	MM-SC/BIDI	SM-ST	SM-SC	SM-E2	SM-SC/BIDI
Article no. DL CAN-R	01000 7551	01000 7562	01000 7571	01000 7573	01000 7573-BIDI	01000 7581	01000 7583	01000 7585	01000 7583-BIDI
FO-connector	ST	ST	ST	SC	SC	ST	SC	E-2000	SC
Fiber type	POF 980/1000 µm	HCS 200/230 µm	Multimode 62.5 (50) /125 µm			Singlemode 9/125 µm			
Optical budget	12 dB	12 dB	12 dB			16 dB			
FO range	50 m (180 dB/km)	200 m (8 dB/km)	5 km (1 dB/km)			30 km, others up to 100 km on request (0.3 dB/km)			
Wavelength	650 nm	850 nm	1310 nm		1310 nm 1550 nm	1310 nm			1310 nm 1550 nm
Data rate max.	10, 20, 22,2, 50, 100, 125, 250, 500, 800, 1000 Kbaud Switchable: none or wave impedance (Rw + Rpd + Rpu)								
Transmission type	Half duplex								
Identifier	11 Bit, 29 Bit or both								
Terminating resistor	Switchable: none or wave impedance (Rw + Rpd + Rpu)								
CAN Cable length	Acc. to CAN Specification								
CAN Connector	9-pole Sub-D female and 6-pole terminal								
Status-LEDs	Power supply (green) / Failure (red) / Data receive (green) / Status (red) / FiberView (red, yellow, green)								
Power supply	12-30 VDC, other voltages on request								
Power consumption	5 Watts, 200 mA (24 V)								
Potential separation	500 VDC (24 VDC <-> CAN)								
Operating temperature	-40 °C - +70 °C (Multimode and Singlemode with ST or SC), -20 °C - +55 °C (all others)								
EMC	EN61000-6-2/EN55022 + A1 + A2 Class B								
Weight	570 g								
Dimensions	60 x 100 x 113 mm (60 x 120 x 113 mm incl. connector)								
Housing	Stainless steel, powder coated								



DL422



Type	P-ST	H-ST	MM-ST	MM-SC	MM-SC/BIDI	SM-ST	SM-SC	SM-E2	SM-SC/BIDI
Article no. DL422	01000 2101	01000 2111	01000 2121	01000 2123	01000 2123-BIDI A 2123-BIDI B	01000 2131	01000 2133	01000 2135	01000 2133-BIDI A 2133-BIDI B
Article no. DL422-2x	01000 2151	01000 2162	01000 2171	01000 2173	01000 2173-BIDI	01000 2181	01000 2183	01000 2185	01000 2183-BIDI
FO-connector	ST	ST	ST	SC	SC	ST	SC	E-2000	SC
Fiber type	POF 980/1000 μm	HCS 200/230 μm		Multimode 62.5 (50)/125 μm		Singlemode 9/125 μm			
Optical budget	12 dB	12 dB		12 dB		16 dB			
FO range	50 m (180 dB/km)	200 m (8 dB/km)		5 km (1 dB/km)		30 km, others up to 100 km on request (0.3 dB/km)			
Wavelength	650 nm	850 nm	1310 nm		1310 nm 1550 nm	1310 nm			1310 nm 1550 nm
Data rate max.	Point-to-point structure: 1.5 MBit/s max. / Line topology: 1.5 MBit/s divided by no. of DL422 systems								
Transmission type	Duplex, Half duplex bei DL422-2x								
Terminating resistor	Switchable: none or wave impedance (Rw + Rpd + Rpu)								
RS422 Cable length	50 m								
RS422 Connector	9-pole Sub-D female and-6 pole terminal								
Status-LEDs	Power supply (green) / Data (yellow) / Status (red)								
Power supply	12-30 VDC, other voltages on request								
Power consumption	5 Watts, 200 mA (24 V)								
Potential separation	500 VDC [24 VDC <-> RS422]								
Operating temperature	-40 °C - +70 °C (Multimode and Singlemode with ST or SC), -20 °C - +55 °C (all others)								
EMC	EN61000-6-2/EN55022 + A1 + A2 Class B								
Weight	570 g								
Dimensions	60 x 100 x 113 mm (60 x 120 x 113 mm incl. connector)								
Housing	Stainless steel, powder coated								

RS422-FO-SYSTEM PROTOCOL TRANSPARENT

The fiber optic systems DL422 connect applications with a RS422 interface via fiber optics.

With the help of this innovative system optical bus, star, tree and mixed structures are possible.

LEDs and potential-free contacts (optional) of a fault detector relay are able to signal defective states.



DL232 / DL232-R

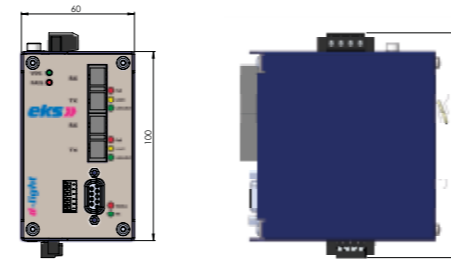
RS232-FO-SYSTEM PROTOCOL TRANSPARENT

The fiber optic systems DL232 connect systems with a RS232-interface via fiber optics. The DL232 allows communication via software-handshake (X-ON/X-OFF). With the help of this innovative system optical bus, star, tree and mixed structures are possible.

The special multifunctional fiber optic system DL232-R also allows the construction of optical ring structures.

LEDs and potential-free contacts (optional for DL232) of a fault detector relay are able to signal defective states.

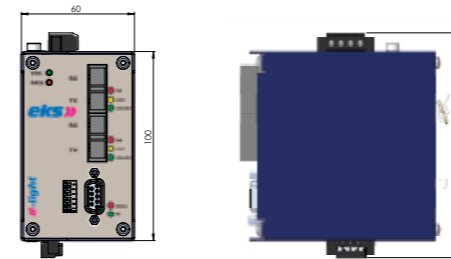
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Type	P-ST	H-ST	MM-ST	MM-SC	MM-SC/BIDI	SM-ST	SM-SC	SM-E2	SM-SC/BIDI
Article no. DL232	01000 1101	01000 1111	01000 1121	01000 1123	01000 1123-BIDI A 1123-BIDI B	01000 1131	01000 1133	01000 1135	01000 1133-BIDI A 1133-BIDI B
Article no. DL232-2x	01000 1151	01000 1162	01000 1171	01000 1173	01000 1173-BIDI	01000 1181	01000 1183	01000 1185	01000 1183-BIDI
Type	P-ST	H-ST	MM-ST	MM-SC	MM-SC/BIDI	SM-ST	SM-SC	SM-E2	SM-SC/BIDI
Article no. DL232-R	01000 1351	01000 1362	01000 1371	01000 1373	01000 1373-BIDI	01000 1381	01000 1383	01000 1385	01000 1383-BIDI
FO-connector	ST	ST	ST	SC	SC	ST	SC	E-2000	SC
Fiber type	POF 980/1000 µm	HCS 200/230 µm	Multimode 62.5 (50)/125 µm			Singlemode 9/125 µm			
Optical budget	12 dB	12 dB	12 dB			16 dB			
FO range	50 m (180 dB/km)	200 m (8 dB/km)	5 km (1 dB/km)			30 km, others up to 100 km on request (0.3 dB/km)			
Wavelength	650 nm	850 nm	1310 nm	1310 nm 1550 nm	1310 nm	1310 nm	1310 nm	1310 nm	1310 nm 1550 nm
Data rate max.	115.2 KBit/s								
Transmission type	Duplex, Half duplex bei DL232-2x und DL232-R								
Operation mode	Switchable: none or wave impedance (Rw + Rpd + Rpu) DTE oder DCE								
RS232 Cable length	15 m								
RS232 Connector	9-pole Sub-D female and 6-pole terminal								
Status-LEDs	Power supply (green) / Failure (red) / Data receive (green) / Status (red) / FiberView (red, yellow, green)								
Power supply	12-30 VDC, other voltages on request								
Power consumption	5 Watts, 200 mA (24 V)								
Potential separation	500 VDC (24 VDC <- RS232)								
Operating temperature	-40 °C - +70 °C (Multimode and Singlemode with ST or SC), -20 °C - +55 °C (all others)								
EMC	EN61000-6-2/EN55022 + A1 + A2 Class B								
Weight	570 g								
Dimensions	60 x 100 x 113 mm (60 x 120 x 113 mm incl. connector)								
Housing	Stainless steel, powder coated								



DL232-MUX



Type	P-ST	H-ST	MM-ST	MM-SC	MM-SC/BIDI	SM-ST	SM-SC	SM-E2	SM-SC/BIDI
Article no. DL232	01000 1201	01000 1211	01000 1221	01000 1223	01000 1223-BIDI A 1223-BIDI B	01000 1231	01000 1233	01000 1235	01000 1233-BIDI A 1233-BIDI B
F0-connector	ST	ST	ST	SC	SC	ST	SC	E-2000	SC
Fiber type	POF 980/1000 µm	HCS 200/230 µm		Multimode 62.5 (50)/125 µm			Singlemode 9/125 µm		
Optical budget	12 dB	12 dB		12 dB			16 dB		
F0 range	50 m (180 dB/km)	200 m (8 dB/km)		5 km (1 dB/km)			30 km, others up to 100 km on request (0.3 dB/km)		
Wavelength	650 nm	850 nm		1310 nm 1550 nm			1310 nm		1310 nm 1550 nm
Data rate max.	115.2 KBit/s								
Transmission type	Duplex								
Operation mode	up to RS232-signals bi-directional								
RS232 Cable length	15 m								
RS232 Connector	9-pole Sub-D female and 6-pole terminal								
Status-LEDs	Power supply (green) / Data (yellow) / Status (red)								
Power supply	12-30 VDC, other voltages on request								
Power consumption	5 Watts, 200 mA (24 V)								
Potential separation	500 VDC (24 VDC <-> RS232)								
Operating temperature	-40 °C – +70 °C (Multimode and Singlemode with ST or SC), -20 °C – +55 °C (all others)								
EMC	EN61000-6-2/EN55022 + A1 + A2 Class B								
Weight	570 g								
Dimensions	60 x 100 x 113 mm (60 x 120 x 113 mm incl. connector)								
Housing	Stainless steel, powder coated								

RS232-MULTIPLEXER-FO-SYSTEM

The system DL232-MUX is a multiplexer for 4xRS232 signals, working bidirectionally via fiber optics. Thus, in addition to the Rx and Tx signals, hardware-handshake signals as RTS, CTS, DCD, DSR and DTR can be transferred, too.

RS232-multiplexers have a similar pin assignment as modems. Two multiplexers, connected by fiber optics, cross the wires and operate like a null modem cable.

Hence, connecting two data processing terminals (with PC pin assignment) requires two 1:1 cables to be able to link the terminals to the multiplexers. Terminals with a DCE- pin assignment have to be connected to the multiplexer via a null modem cable.

LEDs and potential-free contacts (optional) of a fault detector relay are able to signal defective states.

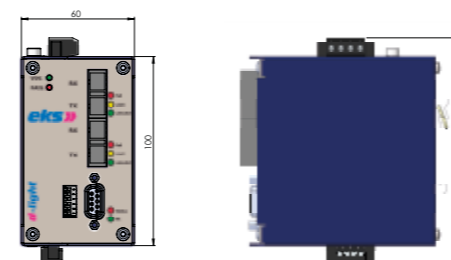


DL TTY

TTY-FO-SYSTEM

The system DL TTY forms an asynchronous TTY- interface (20 mA active, half-active or passive) which can be operated in two ways: either half-duplex or full-duplex.

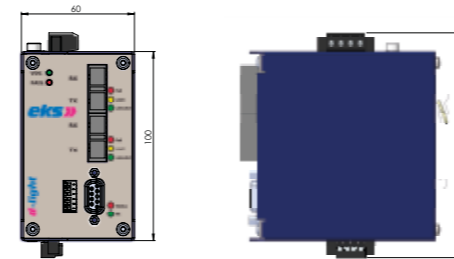
LEDs and potential-free contacts (optional) of a fault detector relay are able to signal defective states.



Type	P-ST	H-ST	MM-ST	MM-SC	MM-SC/BIDI	SM-ST	SM-SC	SM-E2	SM-SC/BIDI
Article no. DL TTY	01000 4101	01000 4111	01000 4121	01000 4123	01000 4123-BIDI A 4123-BIDI B	01000 4131	01000 4133	01000 4135	01000 4133-BIDI A 4133-BIDI B
F0-connector	ST	ST	ST	SC	SC	ST	SC	E-2000	SC
Fiber type	POF 980/1000 µm	HCS 200/230 µm	Multimode 62.5 (50)/125 µm			Singlemode 9/125 µm			
Optical budget	12 dB	12 dB	12 dB			16 dB			
F0 range	50 m (180 dB/km)	200 m (8 dB/km)	5 km (1 dB/km)			30 km, others up to 100 km on request (0.3 dB/km)			
Wavelength	650 nm	850 nm	1310 nm		1310 nm 1550 nm	1310 nm			1310 nm 1550 nm
Data rate max.	57.6 KBit/s								
Schleifenstrom	2 x 20 mA								
Last	<100 Ohm								
Operation mode	Duplex: active, half active or passive / Half duplex: aktive or passive								
TTY Connector	9-pole Sub-D female and 6-pole terminal								
Status-LEDs	Power supply (green) / Data (yellow) / Status (red)								
Power supply	12-30 VDC, other voltages on request								
Power consumption	5 Watts, 200 mA (24 V)								
Potential separation	500 VDC (24 VDC ↔ TTY)								
Operating temperature	-40 °C – +70 °C (Multimode and Singlemode with ST or SC), -20 °C – +55 °C (all others)								
EMC	EN61000-6-2/EN55022 + A1 + A2 Class B								
Weight	570 g								
Dimensions	60 x 100 x 113 mm (60 x 120 x 113 mm incl. connector)								
Housing	Stainless steel, powder coated								



DL LWV



Type	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16
F0-connector	HP VL	HP VL	ST	SMA	ST	SMA	ST	SC	ST	SC	SC BIDI	E-2000	ST	SC	SC BIDI	E-2000
Fiber type	POF 980/1000 μm		POF 980/1000 μm		Multimode 62.5 (50)/125 μm				Singlemode 9/125 μm							
Optical budget	29 dB	12 dB	12 dB	12 dB	12 dB	8 (4.2) dB	12 dB		16 dB							
Data rate max.	57.6 KBit/s	10 MBit/s	5 MBit/s	100 MBit/s	5 MBit/s	100 MBit/s	100 MBit/s		100 MBit/s							
F0 range	150 m	40 m		40 m	2.6 (1.4) km	5 km		30 km, others up to 100 km on request								
Fiber attenuation	180 dB/km		3 dB/km		1 dB/km		0.3 dB/km									
Wavelength	650 nm		820 nm		1310 nm											
Status-LEDs	Power supply (green) / Data (yellow) / Status (red)															
Power supply	12-30 VDC, other voltages on request															
Power consumption	5 Watts, 200 mA (24 V)															
Potential separation	500 VDC															
Operating temperature	-40 °C – +70 °C (Multimode and Singlemode with ST or SC), -20 °C – +55 °C (all others)															
EMC	EN61000-6-2/EN55022 + A1 + A2 Class B															
Weight	500 g															
Dimensions	60 x 100 x 113 mm (60 x 120 x 113 mm incl. connector)															
Housing	Stainless steel, powder coated															

MEDIA CONVERTER AND OPTICAL AMPLIFIER

The fiber optic system DL LWV works as amplifier and media converter for several fiber optic transmission networks.

Less optical power requires amplification. Different fiber types within one application need conversion. The system DL LWV offers various possibilities, corresponding to these requirements.

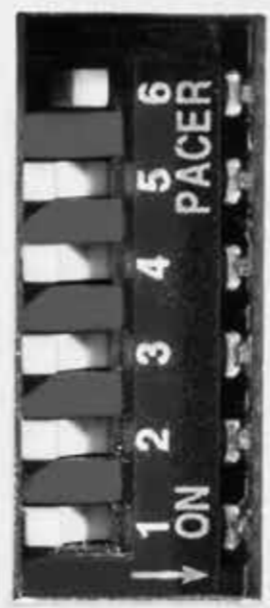
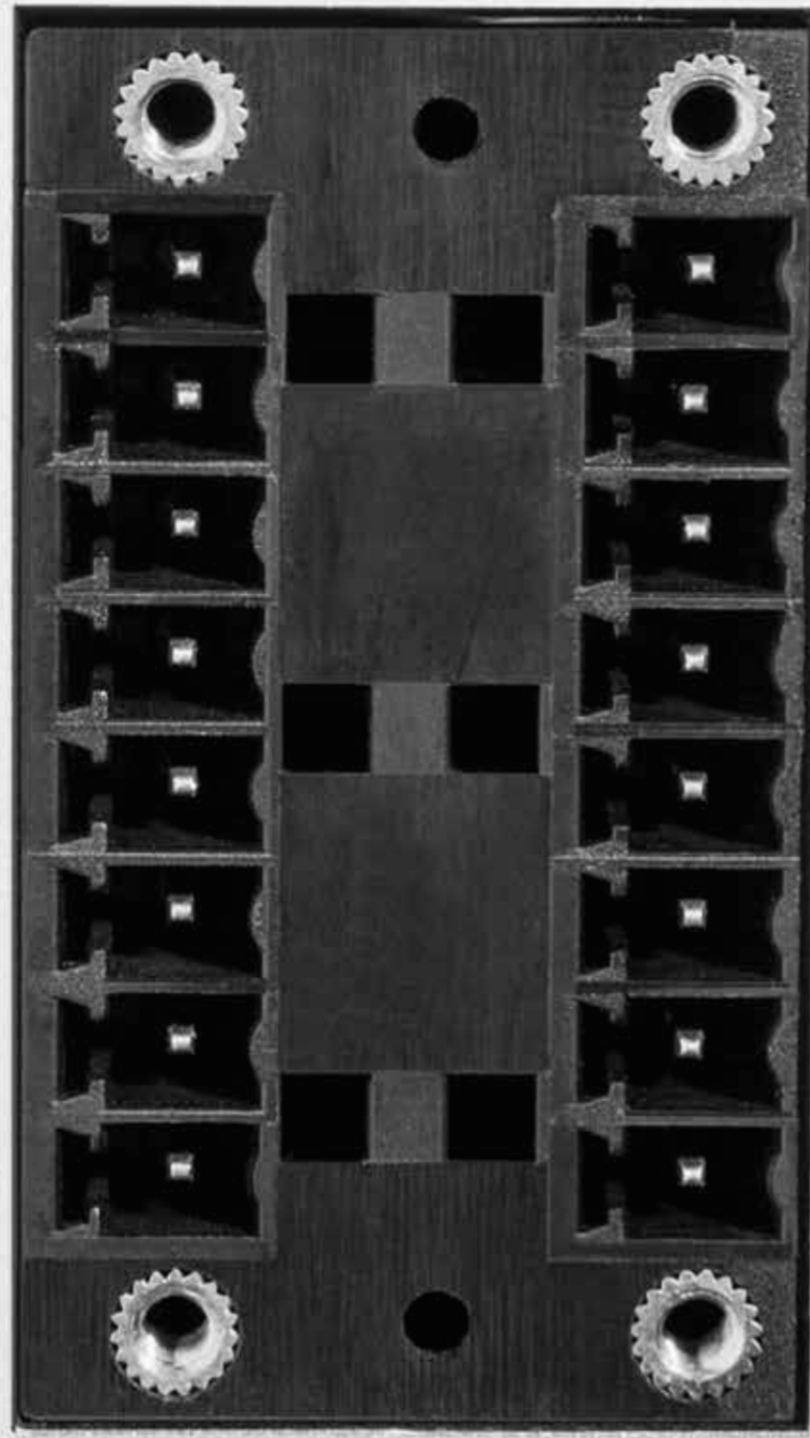
The system contains fiber optic receiver and transmitter components. The incoming signal is electrically processed and then coupled back into the fiber optic cable via the transmitter. With the aid of this intermediate amplifier the line length is unlimited using various fiber types as for instance: POF, HCS, multimode or singlemode fiber optic cable.

LEDs and potential-free contacts (optional) of a fault detector relay are able to signal defective states.

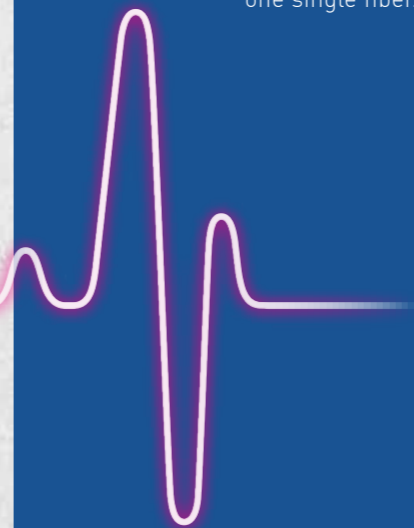
Please note that the adjoining chart just covers a small selection of our product range. In general, any combination of fiber type, wavelength and bandwidth is available. The columns are marked with F1 up to F16 for the types of fiber.

io-light

GNDD
GNDD
GNDA
A1
A2
A3
A4
GNDA



D1
D2
D3
D4
D5
D6
D7
D8



ANALOG / DIGITAL

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 bi-directionally via fiber optics. Thus, it is possible to control and connect drives or lighting reliably and to get a status response. We offer more than 20 versions that are different regarding signal, fiber or connector type. io-light systems can be used in point to point structures for transmission paths of up to 100 km. The contact closure signals and the responses can either be transmitted via two fibers or – when using BiDi-technology – even via one single fiber.



IOL3000

ANALOG- AND CONTACT CLOSURE FO-SYSTEM

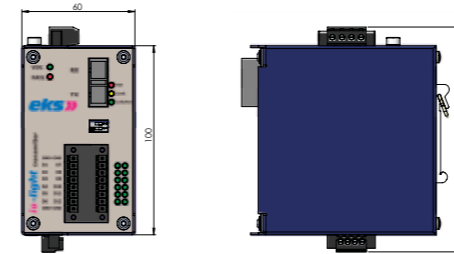
8 X CONTACT CLOSURE 4 X ANALOG SIGNAL

The fiber optic system IOL3000 transmits digital signals (e.g., contact closures, control-signals) and analog signals via fiber optics.

The fiber optic system is able to transmit up to 8 digital signals (12–24 VDC) and/or 4 analog signals (0–10 V or 0–20 mA, digitalized via A/D converter with a resolution of 10 Bit) within a point-to-point structure or line-structure.

The interconnection of an input/pass system (ED) allows the transmission of additional digital and analog data. You can choose if you want to have an electric disjunction (OR) of electrically and optically received data or if the electric data shall overwrite the optical data. In case of analog data the DIP switch must be used to decide whether the optical or the electrical signals shall be transmitted. The devices are available for line or ring structures as one fiber solutions.

LEDs and potential-free contacts of a fault detector relay are able to signal defective states.



Transmitter and Receiver

Transmitter IOL3000	P-ST	H-ST	MM-ST	MM-SC		SM-ST	SM-SC	SM-E2	
4 x Analog 0–10 V	03000 1101	03000 1111	03000 1121	03000 1123		03000 1131	03000 1133	03000 1135	
4 x Analog 0–10 V 8 x Digital 12–24 VDC	03000 1201	03000 1211	03000 1221	03000 1223		03000 1231	03000 1233	03000 1235	
8 x Digital 12–24 VDC	03000 1301	03000 1311	03000 1321	03000 1323		03000 1331	03000 1333	03000 1335	
4 x Analog 0–20 mA 8 x Digital 12–24 VDC	03000 1401	03000 1411	03000 1421	03000 1423		03000 1431	03000 1433	03000 1435	
4 x Analog 0–20 mA	03000 1501	03000 1511	03000 1521	03000 1523		03000 1531	03000 1533	03000 1535	
Receiver IOL3000	P-ST	H-ST	MM-ST	MM-SC		SM-ST	SM-SC	SM-E2	
4 x Analog 0–10 V	03000 2101	03000 2111	03000 2121	03000 2123		03000 2131	03000 2133	03000 2135	
4 x Analog 0–10 V 8 x Digital 12–24 VDC	03000 2201	03000 2211	03000 2221	03000 2223		03000 2231	03000 2233	03000 2235	
8 x Digital 12–24 VDC	03000 2301 (IR)	03000 2311 (IR)	03000 2321 (IR)	03000 2323 (IR)		03000 2331 (IR)	03000 2333 (IR)	03000 2335 (IR)	
4 x Analog 0–20 mA 8 x Digital 12–24 VDC	03000 2401	03000 2411	03000 2421	03000 2423		03000 2431	03000 2433	03000 2435	
4 x Analog 0–20 mA	03000 2501	03000 2511	03000 2521	03000 2523		03000 2531	03000 2533	03000 2535	
FO-connector	ST	ST	ST	SC		ST	SC	E-2000	
Fiber type	POF 980/1000 μm	HCS 200/230 μm		Multimode 62.5 (50)/125 μm				Singlemode 9/125 μm	
Optical budget	12 dB	12 dB		12 dB				16 dB	
FO range	50 m (180 dB/km)	200 m (8 dB/km)		5 km (1 dB/km)				30 km, others up to 100 km on request (0.3 dB/km)	
Wavelength	650 nm	850 nm		1310 nm 1550 nm			1310 nm	1310 nm 1550 nm	
Accuracy Receiver	0,2 %								
Cable length	1 m								
Connector	16-pole terminal								
Status-LEDs	Power supply (green) / Data (yellow) / Status (red)								
Power supply	12–30 VDC, other voltages on request								
Power consumption	5 Watts, 200 mA (24 V)								
Potential separation	500 VDC								
Operating temperature	–25 °C – +70 °C (Multimode and Singlemode with ST or SC), –20 °C – +55 °C (all others)								
EMC	EN61000-6-2/EN55022 + A1 + A2 Class B								
Weight	570 g								
Dimensions	60 x 100 x 113 mm (60 x 120 x 113 mm incl. connector)								
Housing	Stainless steel, powder coated								



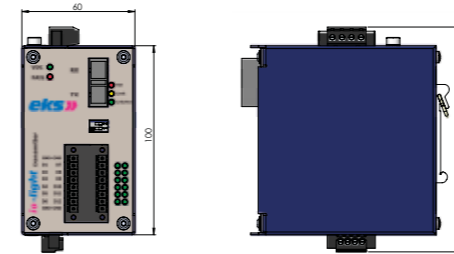
IOL3100

BIDIRECTIONAL CONTACT CLOSURE FO-SYSTEM

4 X CONTACT CLOSURE

The fiber optic system IOL3100 transmits digital signals (e.g., contact closures, control-signals (12–24 VDC) bi-directional via fiber optics.

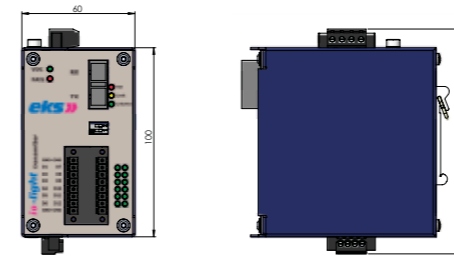
LEDs and potential-free contacts of a fault detector relay are able to signal defective states.



Type	P-ST	H-ST	MM-ST	MM-SC	MM-SC/BIDI	SM-ST	SM-SC	SM-E2	SM-SC/BIDI
Article no. IOL3100	03100 2301	03100 2311	03100 2321	03100 2323	03100 2323-BIDI A 2323-BIDI B	03100 2331	03100 2333	03100 2335	03100 2333-BIDI A 2333-BIDI B
F0-connector	ST	ST	ST	SC	SC	ST	SC	E-2000	SC
Fiber type	POF 980/1000 µm	HCS 200/230 µm	Multimode 62.5 (50)/125 µm			Singlemode 9/125 µm			
Optical budget	12 dB	12 dB	12 dB			16 dB			
F0 range	50 m (180 dB/km)	200 m (8 dB/km)	5 km (1 dB/km)			30 km, others up to 100 km on request (0.3 dB/km)			
Wavelength	650 nm	850 nm	1310 nm		1310 nm 1550 nm	1310 nm			1310 nm 1550 nm
Signal input	12–24 VDC / 5 mA								
Signal output	30 VDC (1A) / 250 VAC (1 A)								
Cable length	1 m								
Connector	16-pole terminal								
Status-LEDs	Power supply (green) / Data (yellow) / Status (red)								
Power supply	12–30 VDC, other voltages on request								
Power consumption	5 Watts, 200 mA (24 V)								
Potential separation	500 VDC								
Operating temperature	–40 °C – +70 °C (Multimode and Singlemode with ST or SC), –20 °C – +55 °C (all others)								
EMC	EN61000-6-2/EN55022 + A1 + A2 Class B								
Weight	570 g								
Dimensions	60 x 100 x 113 mm (60 x 120 x 113 mm incl. connector)								
Housing	Stainless steel, powder coated								



IOL3200



Transmitter and Receiver

Transmitter	P-ST	H-ST	MM-ST	MM-SC		SM-ST	SM-SC	SM-E2	
Article no. IOL3200-TX-12D	03200 1301	03200 1311	03200 1321	03200 1323		03200 1331	03200 1333	03200 1335	
Receiver	P-ST	H-ST	MM-ST	MM-SC		SM-ST	SM-SC	SM-E2	
Article no. IOL3200-RX-12D	03200 2301	03200 2312	03200 2321	03200 2323		03200 2331	03200 2333	03200 2335	
F0-connector	ST	ST	ST	SC		ST	SC	E-2000	
Fiber type	POF 980/1000 μm	HCS 200/230 μm	Multimode 62.5 (50)/125 μm			Singlemode 9/125 μm			
Optical budget	12 dB	12 dB	12 dB			16 dB			
F0 range	50 m (180 dB/km)	200 m (8 dB/km)	5 km (1 dB/km)			30 km, others up to 100 km on request (0.3 dB/km)			
Wavelength	650 nm	850 nm	1310 nm	1310 nm 1550 nm		1310 nm		1310 nm 1550 nm	
Signal input	12–24 VDC / 5 mA								
Signal output	30 VDC (1 A) / 60 VDC (0.2 A)								
Cable length	1 m								
Connector	16-pole terminal								
Status-LEDs	Power supply (green) / Failure (red) / Data receive (green) / Status (red) / FiberView (red, yellow, green)								
Power supply	12–30 VDC, other voltages on request								
Power consumption	5 Watts, 200 mA (24 V)								
Potential separation	500 VDC								
Operating temperature	–40 °C – +70 °C (Multimode and Singlemode with ST or SC), –20 °C – +55 °C (all others)								
EMC	EN61000-6-2/EN55022 + A1 + A2 Class B								
Weight	570 g								
Dimensions	60 x 100 x 113 mm (60 x 120 x 113 mm incl. connector)								
Housing	Stainless steel, powder coated								

CONTACT CLOSURE FO-SYSTEM

12 X CONTACT CLOSURE

The fiber optic system IOL3200 transmits digital signals (e.g., contact closures, control-signals) via fiber optics.

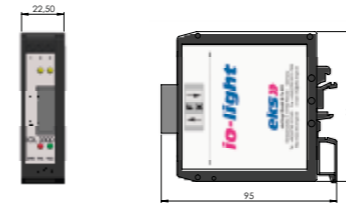
Using addressed subscribers, the fiber optic system is able to transmit up to 12 digital signals (12–24 VDC) within a point-to-point structure.

The interconnection of an input/pass system allows the transmission of additional digital data. You can choose if you want to have an electric disjunction (OR) of electrically and optically received data or if the electric data shall overwrite the optical data. The devices are available for line or ring structures as one fiber solutions.

LEDs and potential-free contacts of a fault detector relay are able to signal defective states.



IOL3300



Type	P-ST	H-ST	MM-ST	MM-SC	MM-SC/BIDI	SM-ST	SM-SC	SM-E2	SM-SC/BIDI
Article no. IOL3300-TRX-1D	03300 2301	03300 2311	03300 2321	03300 2323	03300 2323-BIDI A 2323-BIDI B	03300 2331	03300 2333	03300 2335	03300 2333-BIDI A 2333-BIDI B
F0-connector	ST	ST	ST	SC	SC	ST	SC	E-2000	SC
Fiber type	POF 980/1000 μm	HCS 200/230 μm		Multimode 62.5 (50)/125 μm			Singlemode 9/125 μm		
Optical budget	12 dB	12 dB		12 dB			16 dB		
F0 range	50 m (180 dB/km)	200 m (8 dB/km)		5 km (1 dB/km)			30 km, others up to 100 km on request (0.3 dB/km)		
Wavelength	650 nm	850 nm	1310 nm		1310 nm 1550 nm	1310 nm			1310 nm 1550 nm
Signal input	10–30 VDC / 5 mA								
Signal output	24 VAC (1 A) / 24 VDC (1 A) / 60 VDC (0.3 A)								
Cable length	1 m								
Failure relay	24 VDC (1 A) / 60 VDC (0.3 A)								
Status-LEDs	Power supply (green) / Data (yellow) / Status (red)								
Power supply	12–30 VDC								
Power consumption	2.5 Watts, 100 mA (24 V)								
Operating temperature	–40 °C – +70 °C (Multimode and Singlemode with ST or SC), –20 °C – +55 °C (all others)								
EMC	EN61000-6-2/EN55022 + A1 + A2 Class B								
Weight	150 g								
Dimensions	22.5 x 93 x 82 mm								
Housing	Polyamide, black								

CONTACT CLOSURE FO-SYSTEM

1 X CONTACT CLOSURE

The fiber optic system IOL3300 transmits digital signals (e.g., contact closures, control-signals) via fiber optics.

The fiber optic cable is able to transmit one digital signal (12–24 VDC) in both directions via one or two fiber.

LEDs and potential-free contacts of a fault detector relay are able to signal defective states.



IOL3400



Type	P-ST	H-ST	MM-ST	MM-SC		SM-ST	SM-SC	SM-E2	
Article no. IOL3400 (RX)	03400 2301	03400 2311	03400 2321	03400 2323		03400 2331	03400 2333	03400 2335	
Article no. IOL3400 (TX)	03400 1301	03400 1311	03400 1321	03400 1323		03400 1331	03400 1333	03400 1335	
FO-connector	ST	ST	ST	SC		ST	SC	E-2000	
Fiber type	POF 980/1000 µm		HCS 200/230 µm		Multimode 62.5 (50)/125 µm		Singlemode 9/125 µm		
Optical budget	12 dB		12 dB		12 dB		16 dB		
FO range	50 m (180 dB/km)		200 m (8 dB/km)		5 km (1 dB/km)		30 km, others up to 100 km on request (0.3 dB/km)		
Wavelength	650 nm		850 nm		1310 nm		1310 nm		
Signal input	acc. to EN62053-31, Class A or Class B depending on IOL-3400 Power supply								
Signal output	acc. to EN62053-31								
Cable length	1 m								
Failure relay	24 VDC (1 A) / 60 VDC (0.3 A)								
Status-LEDs	Power supply (green) / Data (yellow) / Status (red)								
Power supply	12-30 VDC								
Power consumption	2.5 Watts, 100 mA (24 V)								
Operating temperature	-40 °C - +70 °C (Multimode and Singlemode with ST or SC), -20 °C - +55 °C (all others)								
EMC	EN61000-6-2/EN55022 + A1 + A2 Class B								
Weight	150 g								
Dimensions	22,5 x 93 x 82 mm								
Housing	Polyamide, black								

CONTACT CLOSURE FO-SYSTEM

1 X SO IMPULSE SIGNAL

The FO-system IOL3400 is used for the uni directional transmission of a SO impulse output.

For the transmission of the impulse a simplex fiber optic cable is enough.

LEDs and potential-free contacts of a fault detector relay are able to signal defective states.

OUR PROMISE:



so easy»»

We would like to make it as simple as possible for you: The cooperation with our customers is characterized by fast response times, direct communication and minimum bureaucracy. Our general agreements are fair and our support prompt. We are open for new developments and react flexibly to your needs.

so clever»»

We deliver efficient solutions from one source - from active and passive components to the corresponding accessories and customized services. Comprehensive testing and simulation saves time and money. Our clear structure for prices and discounts makes business with us transparent.

so safe»»

With FO technology and exclusive customizing we offer a high degree of security. Since for us security means more than product security. It also covers all subsequent processes.

so quick»»

Our customers benefit from our fast production processes. They are continuously improved and well documented. We also require these standards from our suppliers. This combination of performance and efficiency is the only way we can ensure and maintain short delivery periods.



MAKING LIFE SAFER

Fast networks and technology enrich us every day – in both private and working life. For that, reliable function and permanent availability are indispensable. With the best products for intelligent performance, we ensure every day that data is safely transmitted, infrastructures work faultlessly and that our workplaces remain competitive.

Our innovation capability significantly contribute to making life safer. Day after day. In every single moment.

V. 1.5 Subject to technical alterations. Product design can differ from original design.



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