PSI-MOS-RS422/FO 1300 E Serial to Fiber Converter

perle.com/products/serial-extenders/psi-mos-rs422-fo1300e-rs422-to-fiber.shtml

Connect RS422 and RS485 devices to fiber optic cable

- Extend serial data up to 28 miles
- Immune to EMI, RFI and transient surges
- Point-to-point or star configuration
- SC type fiber connectors
- Terminal Block for 4-wire RS422/RS485 Connections

The PSI-MOS-RS422/FO 1300 E Serial to Fiber Converter transparently connects 4-wire RS422/RS485 and INTERBUS devices to fiber optic cable. By transmitting serial data over optical fiber, these serial media converters provide an economical path to extend the reach of RS422 and RS485 devices.

Long Distance Serial Data Transmission over Fiber

Using the FO 1300 E Serial to Fiber Converter you can extend your serial data transmission up to 27km (16.7 miles) over multimode fiber or 45km (28 miles) over single mode fiber. The result is that any two pieces of asynchronous serial equipment, located miles apart, can communicate at full duplex over fiber optic cable at rates up to 2 Mbps.

EMI, RFI and Transient Surge Immunity

Another advantage of the FO 1300 E fiber optic transmission system is the electrically isolated connection of devices. Electromagnetic interference (EMI) is a common phenomenon in typical environments like industrial plants, warehouses and factory floors. This interference can cause corruption of data over RS422 or copper-based Ethernet links. Data transmitted over fiber optic cable however is completely immune to this type of noise, thus preventing the negative effects of voltage equalization currents and electromagnetic interference on the data cables. A Serial to Fiber Media Converter therefore enables you to inter-connect your serial devices over fiber ensuring optimal data transmission, increased availability of the system, and improved network design flexibility for point-to-point connections and star structures.

Flexible Fiber Optic Connections

The FO 1300 E operates at 1300 nm wavelength, using a separate LED emitter and photo-detector on SC type connectors. Almost any multimode or single mode glass fiber size can be used.

Power Budget Considerations

Calculating the power budget is critically important with planning the fiber optic link. The optical power budget is the amount of light required to transmit data successfully over distance through a fiber-optic connection. The amount of light energy available within the setup will dictate the length of the fiber optic cable run between serial media converters within the network. Optical power budgets are critical to help businesses avoid signal distortion. To learn how to calculate optical power budget read our technical note. Transmit and receive dBm

can be found in the Hardware specifications.

Transmit each serial signal out over 10 fiber optic lines

Up to ten (10) Serial to Fiber Converters can be grouped together using the TBUS DIN Rail bus system for voltage and data. This allows the serial converter to operate as a star coupler, taking the serial data input signal and distributing it to all Fiber optic output ports.

High Quality Features and Support

The FO 1300 E are also equipped with comprehensive diagnostic functions to increase system availability, simplify start-up and permanently monitor the optical transmission quality. The integrated optical diagnostics allow permanent monitoring of the FO paths during installation and operation. The floating switch contact is activated when the signal level on the fiber optic paths reaches a critical level. This early alarm generation enables critical system states to be detected before they result in failure. These cost and time saving features, along with free worldwide technical support, make the FO 1300 E serial to fiber converter the smart choice for IT professionals.

- Supply voltage routed through via DIN rail connectors
- Connections can be plugged in using a COMBICON screw terminal block
- Redundant power supply possible by means of optional system power supply unit
- High-quality electrical isolation between all interfaces (INTERBUS, fiber optic ports, power supply, DIN rail connector)
- Approved for use in zone 2
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Automatic data rate detection for all data rates up to 2 Mbps

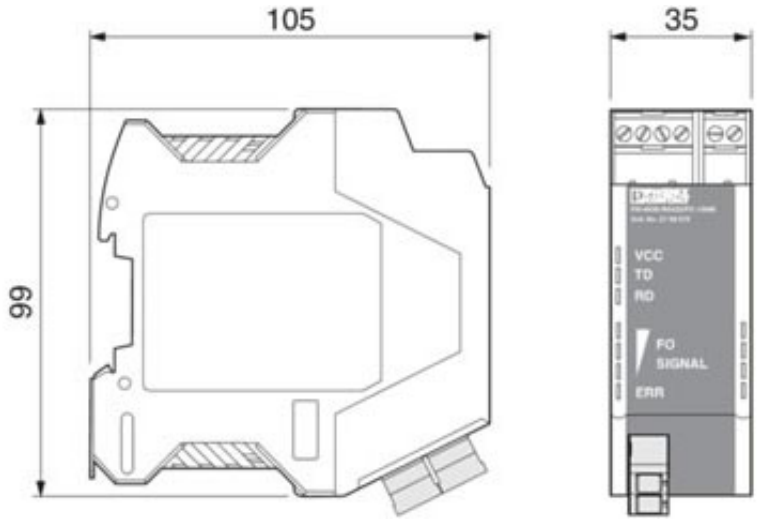
PSI-MOS-RS422/FO 1300 E Technical Specifications

Ambient conditions	
Ambient temperature (operation)	-20 °C ... 60 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Permissible humidity (operation)	30 % ... 95 % (non-condensing)

Altitude	5000 m (For restrictions see manufacturer's declaration)
Degree of protection	IP20
Noise immunity	EN 61000-6-2:2005
Standards and Regulations	
Electromagnetic compatibility	Conformance with EMC directive 89/336/EC
Type of test	Vibration resistance in acc. with EN 60068-2-6/IEC 60068-2-6
Test result	5g, 10-150 Hz, 2.5 h, in XYZ direction
Type of test	Shock in acc. with EN 60068-2-27/IEC 60068-2-27
Test result	15g, 11 ms period, half-sine shock pulse
Shock	15g in all directions in acc. with IEC 60068-2-27
Noise emission	EN 55011
Noise immunity	EN 61000-6-2:2005
Connection in acc. with standard	CUL
Standards/regulations	EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6
Vibration (operation)	In acc. with IEC 60068-2-6: 5g, 150 Hz
Conformance	CE-compliant
ATEX	II 3 G Ex nA nC IIC T4 Gc X
UL, USA/Canada	508 listed 508 recognized
Free from substances that could impair the application of coating	according to P-VW 3.10.7 57 65 0 VW-AUDI-Seat central standard
Optical interface FO	
Number of FO ports	1
Wavelength	1300 nm
Transmission length incl. 3 dB system reserve	27 km (With F-G 50/125 0.7 dB/km at 1300 nm) 22 km (with F-G 62.5/125 0.8 dB/km at 1300 nm)

	45 km (With F-E 9/125 0,4 dB/km at 1300 nm)
Transmission medium	Multi-mode fiberglass Single-mode fiberglass
Transmission protocol	Transparent to protocol for RS-422 interface
Connection method	SC duplex
	General
Transmission channels	2 (1/1) RD, TD, full duplex
Bit distortion, input	± 35 % (permitted)
Bit distortion, output	< 6.25 %
Electrical isolation	VCC // RS-422
Test voltage data interface/power supply	1.5 kVrms (50 Hz, 1 min.)
Electromagnetic compatibility	Conformance with EMC directive 89/336/EC
Noise emission	EN 55011
Net weight	190.68 g
Housing material	PA 6.6-FR
Color	green
MTBF	544 Years (Telcordia standard, 25°C temperature, 21% operating cycle (5 days a week, 8 hours a day)) 113 Years (Telcordia standard, 40°C temperature, 34.25% operating cycle (5 days a week, 12 hours a day))
Conformance	CE-compliant
ATEX	II 3 G Ex nA nC IIC T4 Gc X (Please follow the special installation instructions in the documentation!)
UL, USA/Canada	508 listed 508 recognized
	Digital outputs
Output name	Relay output
Output description	Alarm output
Number of outputs	1

Maximum switching voltage	60 V DC 42 V AC
Limiting continuous current	1:00 AM
Power supply	
Nominal supply voltage	24 V DC (With UL approval)
Supply voltage range	18 V DC ... 32 V DC
Typical current consumption	110 mA (24 V DC)
Connection method	COMBICON plug-in screw terminal block
Serial interface	
Interface 1	RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1
Operating mode	Full duplex
Connection method	Pluggable screw connection
Transmission medium	Copper
Transmission length	≤ 1000 m (depending on the data rate, with shielded, twisted data cable)
Conductor cross section solid min.	0.2 mm²
Conductor cross section solid max.	2.5 mm²
Conductor cross section flexible min.	0.2 mm²
Conductor cross section flexible max.	2.5 mm²
Conductor cross section AWG min.	24
Conductor cross section AWG max.	14
Serial transmission speed	≤ 2 Mbps
Dimensions	
Width	35 mm
Height	105 mm
Depth	103 mm



Environmental Product Compliance	
China RoHS	Environmentally Friendly Use Period = 50
Reach and RoHS Compliant	Reach and RoHS Compliant

Approvals	
	cUL Listed cULus Listed UL Listed ATEX EAC DNV cUL Recognized cULus Recognized UL Recognized

Commercial data	
Packing unit	1
Weight per piece	229.6 g
Country of origin	Germany
Warranty	1 Year

Classifications	
eCl@ss 4.0	27230207
eCl@ss 4.1	27230207
eCl@ss 5.0	27230207

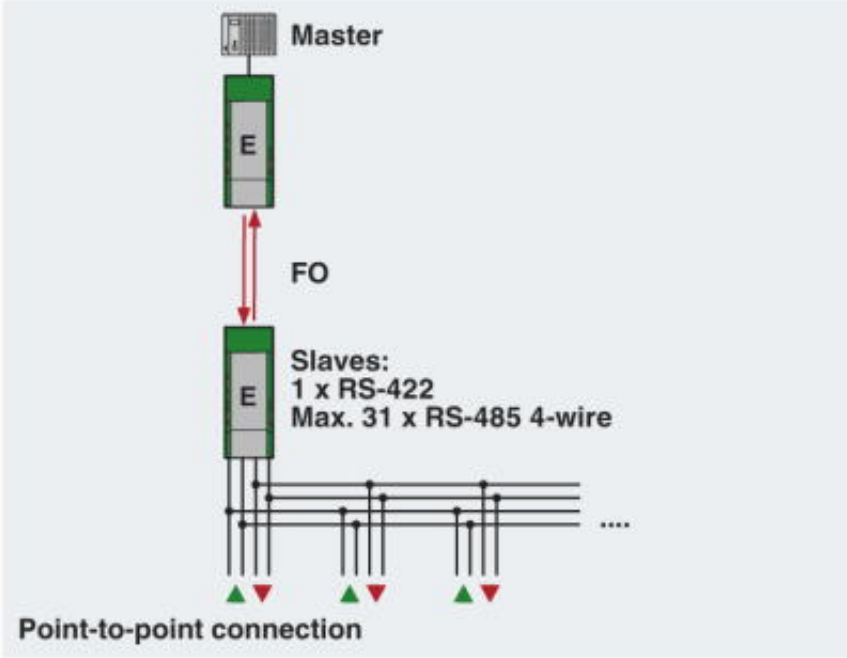
eCl@ss 5.1	27230207
eCl@ss 6.0	27230207
eCl@ss 7.0	27230207
eCl@ss 8.0	19179290
eCl@ss 9.0	19179290
ETIM 2.0	EC001423
ETIM 3.0	EC001423
ETIM 4.0	EC001423
ETIM 5.0	EC000310
ETIM 6.0	EC000310
UNSPSC 6.01	30211506
UNSPSC 7.0901	39121008
UNSPSC 11	39121008
UNSPSC 12.01	39121008
UNSPSC 13.2	43222604

PSI-MOS-RS422/FO 1300 E Serial to Fiber Media Converter Applications

- near heavy electrical equipment
- in environments with electrical (EMI) or radio (RFI) interference
- in environments with transient surges
- in industrial plants, warehouses and factory floors
- enabling asynchronous serial equipment to communicate at full duplex, with rates up to 2 Mbps, over optical fiber

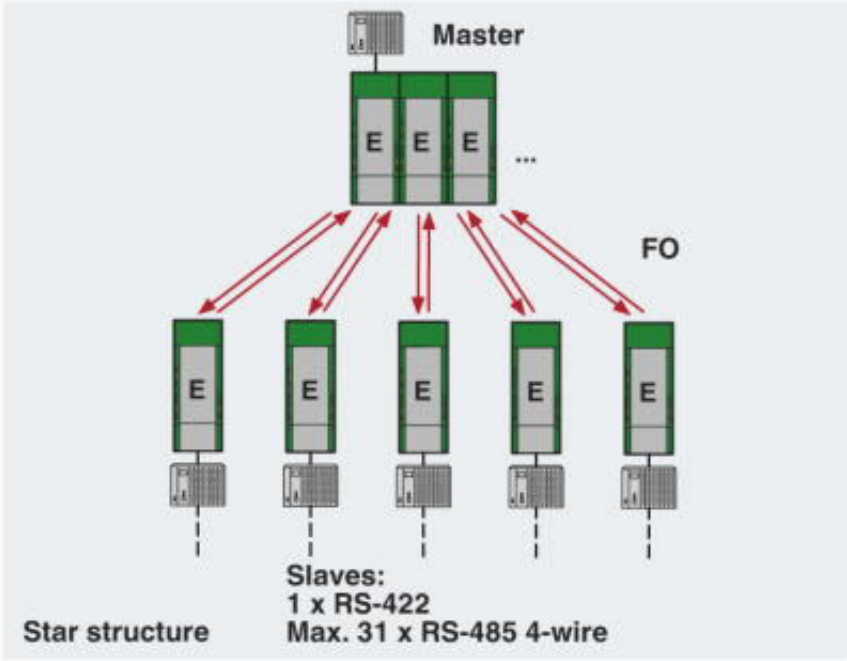
Point-to-point connections between serial devices over fiber

You can use two PSI-MOS-RS422/FO 1300 E Serial to Fiber Converters to easily convert a data link from copper cable to fiber optics.



Star structures

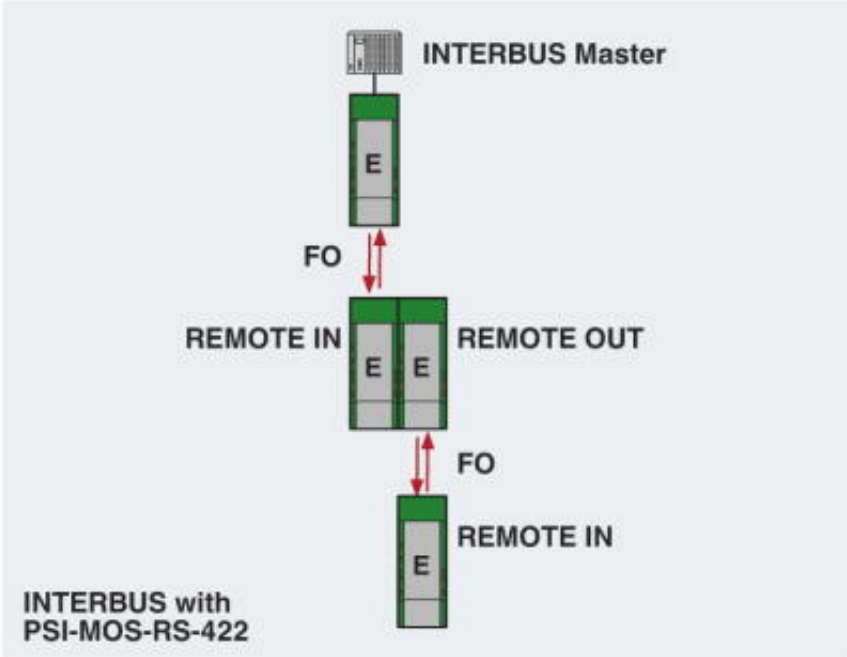
You can network RS-422/RS485 4-wire devices within a star structure as a master/slave network. Depending on the number of star lines required, several PSI-MOS-RS422/FO 1300 E Serial to Fiber Converters are connected to TBUS DIN Rail bus systems for voltage and data. This makes up to 10 fiber optic ports available. Cross-wiring for serial data and for the supply voltage is provided automatically by the DIN rail connector.



INTERBUS Networks

PSI-MOS-RS422/FO 850 E converters also allow you to create INTERBUS networks with FO technology. For

standard INTERBUS connections, the REMOTE IN and REMOTE OUT interfaces are converted to fiber optics using one PSI-MOS-RS422/FO 850 E terminal device each.



Block Diagram