

# Heavy Industrial RS-232/422/485 to Fiber Optic Converters

FOSTCDRI-PH-MC, FOSTCDRI-PH-MT, FOSTCDRI-PH-SC



The FOSTCDRI-PH-xx series are premium heavy industrial serial to fiber optic converters. Designed for rugged industrial environments, they have been put through most exacting compliance testing in the industry. Meeting IEC 61850-3 and IEEE 1613 requirements, they are suitable for installation in electrical substations. These specifications are more stringent than the NEMA TS1/TS2 requirements for transportation applications. Powerful isolation protects equipment and data from damaging ground loops and surges. Additional isolation on the power supply circuits adds a third degree of protection.

Packaged in a rugged IP30 metal case, these converters convert serial signals to multi-mode or single-mode fiber optic. Bit-wise enabled circuitry automatically detects the data rate without setting a DIP switch.

In addition to direct point-to-point connectivity, operation in multi-drop mode is possible. This enables serial devices to communicate with up to 31 others in a fiber ring. Supporting mixed standards, you can replace other converters and add the EMI / RFI protection inherent to fiber optic communications.

## PRODUCT FEATURES

- IEEE-61850-3, IEEE-1613
- NEMA TS2 (FOSTCDRI-PH-MT)
- Multi or Single Mode, ST or SC Versions
- -40 to 85°C Operating Temperature
- Rugged, IP30 Metal Panel Mount Case
- 50G Shock, 4G Vibration
- 2kV Triple Isolation

## ORDERING INFORMATION

MODEL NUMBER	DESCRIPTION
FOSTCDRI-PH-MC	Serial to Multi-mode SC Converter
FOSTCDRI-PH-MT	Serial to Multi-mode ST Converter
FOSTCDRI-PH-SC	Serial to Single-mode SC Converter

## ACCESSORIES

MDR-40-24 - DIN Rail Mount Power Supply 24VDC, 1.7 A output power

DRAD35 - DIN Rail Mounting Kit 35mm

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## SPECIFICATIONS

SERIAL TECHNOLOGY		TERMINAL BLOCKS	
RS-232	TD, RD, GND	Wire Size Accepted	28 to 12 AWG, copper wire only
RS-422	TDA(-), TDB(+), RDA(-), RDB(+)	Pitch	5.08 mm
RS-485 4-Wire	TDA(-), TDB(+), RDA(-), RDB(+)	Insulation Resistance	$\geq 500 \text{ M}\Omega$ @ 500 VDC
RS-485 2-Wire	Data A(-), Data B(+)	Maximum Torque	5 Kg / cm
Serial Connector	5-position, removable terminal block	INDICATORS	
Data Rate	9.6 to 115.2 Kbps	Power	Red LED
Isolation	2 KV RMS, 1 minute	TD / RD (Each Port)	Green LED
Surge Protection	600 W peak power dissipation Clamping time < 1 pico-second	MECHANICAL	
Industrial Bus	Modbus ASCII / RTU	Dimensions	13.24 x 9.29 x 3.0 cm (5.2 x 3.7 x 1.3 in)
Bias	Built-in, switchable 1.2K $\Omega$ XMT/RCV	Enclosure	IP30 metal, panel mount
Termination	Built-in, switchable 120 $\Omega$	Weight	0.46 lbs (208.65 grams)
FIBER OPTIC TECHNOLOGY		MTBF	127,103 hours
Type / Wavelength	Multi-mode or Single-mode 1310 nm	MTBF Calc. Method	Parts Count Reliability Prediction
Output Power (MM)	-19 (min), -14 (max) dBm	ENVIRONMENTAL	
Output Power (SM)	-15 (min), -8 (max) dBm	Operating Temperature	-40 to 85°C (-40 to 176°F)
RCV Sensitivity	$\leq -32$ dBm	Storage Temperature	-40 to 85°C (-40 to 176°F)
Cable	62.5 / 125 $\mu$ M (MM), 9 / 125 $\mu$ M (SM)	Operating Humidity	0 to 95% Non-condensing
Data Rate	9.6 to 115.2 kbps	REGULATORY	
Distance	2 kM (MM), 15 kM (SM)	Approvals	FCC, CE, IEC 61850-3, IEEE 1613 UL C1 D2, File: E245458, • NEMA TS2 (FOSTCDRI-PH-MT)
Fiber Light	Modulated		
POWER			
Source	External		
Power Connector	2-position, removable terminal block		
Input Voltage	10 to 48 VDC (56 VDC maximum)		
Power Consumption	0.9 W typical (2.6W with termination)		

## IEC 61850-3 ELECTRO MAGNETIC INTERFERENCE SPECIFICATIONS

Test	Description	Test Level	Level
61000-4-2	ESD	8 kV 15 kV	4 4
61000-4-3	Radiated RFI	Enclosure Contact Enclosure Air Enclosure Ports	10 V/m
61000-4-4	Burst (Fast Transient)	Signal Ports DC Power Ports	4 kV @ 2.5 KHz 4 kV
61000-4-5	Surge	Signal Ports DC Power Ports	2.5 kV line to earth, 1 kV line to line 2.5 kV line to earth, 1 kV line to line
61000-4-6	Induced (Conductive) RFI	Signal Ports DC Power Ports	10 V RMS 10 V RMS
61000-4-12	Damped Oscillatory	Signal Ports DC Power Ports	2.5 kV common, 1 kV diff mode @ 1MHz 2.5 kV common, 1 kV diff mode @ 1MHz
61000-4-16	Mains Frequency Voltage	Signal Ports DC Power Ports	30 V Continuous, 300 V for 1 s 30 V Continuous, 300 V for 1 s
61000-4-17	Ripple on DC Power Supply	DC Power Ports	10%

## IEEE 1613 C37.90 ELECTROMAGNETIC INTERFERENCE SPECIFICATIONS

C37.90.3	ESD	Enclosure Contact Enclosure Air	8 kV 15 kV	-
C37.90.2	Radiated RFI	Enclosure Ports	10 v/m	-
C37.90.1	Fast Transient	Signal Ports DC Power Ports	4 kV @ 2.5 kHz 4 kV	-

## ENVIRONMENTAL SPECIFICATIONS

60068-2-1	Cold Temperature	Test Ad	(-)40 C, 16 Hours	-
60068-2-2	Dry Heat	Test Bd	(+)85 C, 16 Hours	-
60068-2-30	Humidity (damp heat cycle)	Test Dd	90% (non-condensing) (+)55C, 6 Cycles	-
IEC 60068-2-6	Vibration	Test Fc	4g	Class 2
IEC 60068-2-27	Shock	Test Ea	50g	Class 2
IEC 60068-2-32	Drop	-	6 faces, 3 edges, 1 corner, total 10 drops at 1 m	-