

**ETH-FIBER-SM-2**  
10/100/1000M Ethernet To Fiber Optic  
Single Mode 20KM Converter

SERIALCOMM.COM

Datasheet Revision 2.8

**GENERAL FEATURES:**

- Fiber Point to Point 20km SM
- Plug-and-Play (hot-pluggable)
- Externally Powered
- Fiber optic range of up to 12.4 miles (20 km)
- Available with ST or SC type connectors
- Data direction auto-turnaround - no flow control necessary
- Built-in surge and static protection
- 5 year manufacturer's warranty
- RoHS, CE, and FCC certified



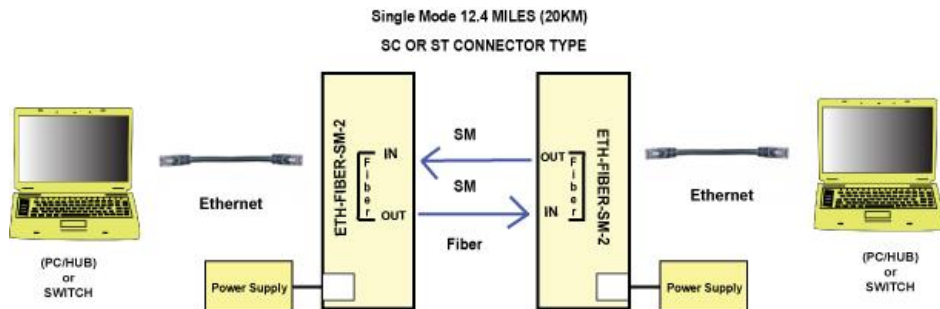
**DESCRIPTION:**

The SerialComm ETH-FIBER-SM-2 is a bi-directional externally powered 10/100/1000M Ethernet to Single Mode Fiber Optic Converter which converts a standard 10/100/1000BaseTX to 1000Base-SX/LX Single Mode SC or ST connector type fiber optic link. A data direction auto-turnaround feature automatically enables the Ethernet transmit and receive data signals when data is present, avoiding the need for software drivers, and making the device fully plug-and-play. The ETH-FIBER-SM-2 supports straight-through (MDI) or crossover (MDX) cable configurations. The ETH-FIBER-SM-2 has a RJ45 connector for the 10/100/1000M Ethernet port, and either an ST type or SC type connector for the fiber optic link. The unit extends the maximum distance of any 10/100/1000M Ethernet signal up to 12.4 miles (20 km) using SM fiber optic cable. The unit is enclosed in a rugged steel housing. An external power supply is included.

**CERTIFICATIONS:**



**APPLICATIONS:**



**SPECIFICATIONS:**

COMMUNICATION	
<b>STANDARDS:</b>	IEEE 802.1 10Base-T, IEEE 802.3u 100Base-T, IEEE 802.3 100Base-FX, IEEE 802.3ab 1000Base-T, IEEE 802.3z 1000Base-SX/LX Standards
<b>MODEL NUMBERS:</b>	ETH-FIBER-SM-2-ST - ST Connector Version ETH-FIBER-SM-2-SC - SC Connector Version
<b>BAUD RATES:</b>	10/100/1000 mbps Half-duplex, 20/200/2000 mbps Full-duplex
<b>CONNECTOR TYPES:</b>	DC Input: Male Jack, Ethernet Side: RJ45 Female and Fiber Side: either 2 X ST Connectors or 2 X SC Connectors
<b>DISTANCE:</b>	10BaseT, 100BaseT, or 1000BaseT Side: 328 ft (100m) and Single Mode Side: 12.4 miles (20 km)
<b>CABLING:</b>	CAT 3, 4, or 5, 5e, 6, 6e, 7, or 7e
ELECTRICAL	
<b>POWER SOURCE:</b>	5VDC
<b>DC/AC POWER ADAPTER:</b>	Included 5VDC / (100 - 240VAC 50/60hz US Type A Plug) 500 mA
<b>POWER CONSUMPTION:</b>	4 Watts
<b>STATIC PROTECTION:</b>	15KV Electric Static Discharge (ESD) Protection
<b>SURGE PROTECTION:</b>	600W Surge Protection
FIBER OPTIC	
<b>FIBER OPTIC CABLING:</b>	Compatible with Single Mode: 8.3/125um, 8.7/125um, 9/125um or 10/125um Fiber Optic Cable
<b>WAVELENGTH:</b>	1310nm
<b>OUTPUT LEVEL (MIN):</b>	-6 dBm
<b>OUTPUT LEVEL (MAX):</b>	-1 dBm
<b>FIBER SENSITIVITY LEVEL:</b>	-21 dBm
MECHANICAL	
<b>HOUSING:</b>	Heavy Duty Steel Housing
<b>DIN RAIL:</b>	Optional DIN Rail Mounts
<b>WEIGHT:</b>	<b>With ST Connector:</b> 8.11oz (230.0 grams) <b>With SC Connector:</b> 7.82oz (221.6 grams)
<b>DIMENSIONS:</b>	<b>With ST Connector:</b> 4.29" X 3.75" X 1.05" (109.0 mm X 95.0 mm X 26.6 mm) <b>With SC Connector:</b> 3.87" X 3.75" X 1.05" (98.2 mm X 95.0 mm X 26.6 mm)
ENVIRONMENTAL	
<b>OPERATING TEMP:</b>	-4° F to 167° F (-20°C to 75° C)
<b>STORAGE TEMP:</b>	-40° F to 185° F (-40°C to 85° C)
<b>OPERATING HUMIDITY:</b>	5% To 95% - No Condensation
QUALITY	
<b>PRODUCT SAFETY:</b>	CE, FCC and RoHS Conformance Certified
<b>QUALITY MANAGEMENT</b>	Manufactured and Distributed to ISO 9001:2015 QMS
<b>MEAN TIME BEFORE FAILURE:</b>	353102 Hours
<b>RELIABILITY:</b>	Low Failure Rate – 99+% Reliability Since Inception
<b>WARRANTY:</b>	5 Year Replacement Warranty

**FIGURE 1: EXTENDING 10/100/1000M ETHERNET DATA DISTANCE**

**ETHERNET RJ45 PIN ASSIGNMENT:**

PIN NUMBER	MDI SIGNAL	MDI-X SIGNAL
1	TX+	RX+
2	TX-	RX-
3	RX+	TX+
6	RX-	TX-
4	Not Connected	Not Connected
5	Not Connected	Not Connected
7	Not Connected	Not Connected
8	Not Connected	Not Connected

**INDICATOR LED TABLE:**

LED	STATE	INDICATION
<b>PWR</b>	OFF	Power Off
	SOLID	Power On
<b>100</b>	OFF	10M Ethernet
	SOLID	100M Ethernet
<b>1000M</b>	OFF	Not 1000M Ethernet
	SOLID	1000M Ethernet
<b>DUP</b>	OFF	Half Duplex
	FLASHING	Full Duplex
<b>TX</b>	OFF	Ethernet Port is not Connected
	FLASHING	Transmitting or Receiving Data
	SOLID	Ethernet is Connected
<b>FX</b>	OFF	Fiber Optic Unit is not Connected
	SOLID	Fiber Optic Unit is Connected

**TROUBLESHOOTING INSTRUCTIONS:**

Using one ETH-FIBER-SM-2 unit:

1. Perform a loop back test on one unit:
  - a) Plug the power connector to the converter.
  - b) Connect the Ethernet port to a PC. Connect Fiber In to Fiber Out.
  - c) Running a Ethernet Analyzer program on the PC, send ASCII characters to the ETH-FIBER-SM-2 converter from one PC port, and check that the characters are received at the same PC port. This tests that the transmit and receive functions of the ETH-FIBER-SM-2 unit is working properly.

Using two ETH-FIBER-SM-2 units:

1. Check that all connections comply with the connection diagrams.
2. Perform a loop back test on two units:
  - a) Plug the power connector to both converters.
  - b) Connect the fiber optic in of one converter and fiber optic out to the other converter.
  - c) Connect the fiber optic out of one converter and fiber optic in to the other converter.
  - d) Connect the Ethernet connections to two Ethernet ports.
  - e) Running Ethernet Analyzer programs on both PCs, send ASCII characters to the ETH-FIBER-SM-2 converter from one PC port, and check that the characters are received at the 2<sup>nd</sup> PC port. Repeat the test in the opposite direction. This tests that the transmit and receive functions of both ETH-FIBER-SM-2 units are working properly.

