

# Single-Mode Fiber Optic Modem

## User's Manual

**MODEL-277SM**  
(English Rev 2.1)



### 1.0 Description

The MODEL 277SM was designed to provide the most versatile connection possible between any asynchronous serial equipment using Fiber Optic cable. It allows any two pieces of asynchronous serial equipment to communicate full or half-duplex over two fibers at typical distances up to 20KM. The converter can also be set up in "Repeater" mode to create a multi-drop master/slave configuration, allowing one serial device to talk to multiple slave devices around a fiber ring.

RS-232 data signals at up to 115.2Kbps and RS-422, or RS-485 data signals at up to 250Kbps are supported. Different standards can be mixed and matched to allow RS-232 devices to connect to your RS-422 or RS-485 system. This means the MODEL 277SM can replace converters and isolators when connecting remote devices, while providing the EMI/RFI and transient immunity of optical fiber.

The MODEL 277SM supports both the Transmit and Receive data lines, and provides full hardware control of the RS-422 /485 driver with automatic Send Data Control circuit.

Timeouts are auto detect between 0.10 and 2.2 ms. All serial connections are provided on the DB-9 male connector or

6-bit terminal, while the single-mode fiber is connected via two SC/ST/FC connectors. The unit is powered by 9-24 VDC at 250 mA max.

### 2.0 RS-232 Connections

Connection of the MODEL 277SM is simple and straight forward. The DB9 male serial connector is used for connect to RS-232 interface. The RS-232 signals are defined as a DTE device (input on Pin 2 and output on Pin 3)

Table 1:RS-232 Connection Diagrams

DB-9 Male (PIN)	RS-232
2	RXD
3	TXD
5	GND

### 3.0 RS-422 & RS-485 Connections

Table 2:RS-422/RS-485 Connection Diagrams

6-Bit Terminal	RS-422	RS-485
PIN1	T+	485+
PIN2	T-	485-
PIN3	R+	NC
PIN4	R-	NC
PIN5	VIN	VIN
PIN6	GND	GND

### 4.0 Fiber Optic Connections

The MODEL277SM uses a separate LED emitter and photo-detector operating at 1310nm wavelength Connections to the emitter and detector are on SC/ST/FC type connectors. One fiber is required for each connection between a transmitter and receiver. In a point-to-point configuration, two fibers are required between the two modems, one for data in each direction. A multi-drop ring configuration requires one fiber between TX and RX around the loop.

The most important consideration in planning the fiber optic link is the "power budget" of the fiber modem. This value represents the amount of loss in dB that can be present in the link between the two modems before the units fail to perform properly. This value includes line attenuation as well

as connector loss. For the MODEL277SM the typical connector-to-connector power budget is 13 dB. Because 9/125um Single Mode Fiber cable typically has a line attenuation of 0.6 dB per Km at 1310 nm, the 13 dB power budget translates into 20 KM..

### 5.0 Specifications

**Transmission Line:** Dual Single-mode optical cable

**Point to Point Transmission:** Asynchronous, half or full-duplex

**Interfaces:** RS-232, RS-422, or RS-485

**Data Rates:** RS-232 0 to 115.2KBPS  
RS-422/485 0 to 250KBPS

**Distance :** RS-485/RS-422 0-1.2Km

**Fiber Typical Range:** Up to 20Km on Single mode glass fiber

**Coupled Power Budget:** 15.0 dB

**Optic Wavelength:** 1310 nm

**Fiber Connector:** SC(ATC-277SM-SC)  
ST(ATC-277SM-ST)  
FC(ATC-277SM-FC)

**Connectors:** DB-9 male for RS-232, 6-Bit terminal for RS-422/485 connection,

**Power Supply:** Requires 9 – 24V VDC @ 250 mA max.

**Operation temperature:**-40°C-70°C

**EMI and Safety:** CE, FCC Class A

**Dimensions:** 96 Lx 66W x 26H(mm)

**Weight:** 0.40Kg

### 6.0 Order Information.

Table 3: Order Information

P/N:	Fiber Type	Wavelength (nm)	Fiber Length(Km)
ATC-277SM-SC	SC	1310	20
ATC-277SM-ST	ST	1310	20
ATC-277SM-FC	FC	1310	20