

Model 279/279A

Single-Mode to Multi-Mode

Fiber Optic Converter

Reference Manual

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1.0 General Description

The Model 279/279A provides transparent conversion between fiber optic devices utilizing multi-mode fiber and those using single-mode fiber. While single-mode fiber can transmit data over much longer distances than multi-mode fiber, each type has its advantages. Multi-mode fiber is well suited to the short distances typical of an installation within a building as opposed to the single-mode variety which is ideal for longer "metropolitan distances."

Single-mode fiber confines the transmitted power to a single-optical mode, which propagates down the center axis of the fiber. This results in an elimination of power loss through leakage out of the fiber walls. The Model 279/279A regenerates signal strength and is mainly used to exceed the distance specification for multi-mode fiber. It can also be used when the optical fiber type specified by a particular piece of equipment is not compatible with installed fiber optic cable.

The Model 279 has the ability to operate from DC to 2.5 mbps while the Model 279A operates from 2,400 baud to 2.5 mbps. It is provided with a loss budget of 15 dB that equates to a distance of approximately 26 kms.

2.0 Specifications

2.1 Interface

Multi-mode: 850 nm, full duplex
Single-mode: 1300 nm, full duplex

2.2 Connectors

Multi-mode: ST
Single-mode: ST

2.3 Data Rate

Model 279: 0 to 2.5 mbps
Model 279A: 2,400 baud to 2.5 mbps

2.4 Loss Budget

15dB max @ 1300 nm on 9/125 um cable
12dB max @ 850 nm on 62.5/125 um cable

2.5 Switches

Line Loss: Adjusts to best performance of single-mode fiber for losses of 2, 5, 10 or 15 dB.

2.6 Indicators

TD and RD LED's and Line-Loss selection LED's

2.7 Power

+12 VDC. Supplied by wall-mount adapter, 110 V - 60 Hz standard, 220 V - 50 Hz optional. A DC adapter Model 1510-0037 is also available that allows operation from a DC source whose voltage is within the range of +18 VDC to +36 VDC.

2.8 Size

7 in W x 3 in H x 1 in D (177.8 mm x 76.2 mm x 25.4 mm)

2.9 Environment

Operating temperature: 0o to +50° C
Storage temperature: -5°C to +75°C
Relative humidity: 5% to 95%, no condensation.

3.0 Installation

3.1 Physical Mounting

The Model 279/279A can be mounted in any position. Care should be exercised when routing the fiber optic cables. The minimum bend radius of 2 in for the cables should not be exceeded. The Model 279/279A is provided with two mounting holes to allow the unit to be attached to any position.

3.2 Installation

The Model 279/279A is designed to interface between single-mode and multi-mode fiber systems. You must have a Model 279/279A at each end of the single-mode fiber cable. Cables used to attach to the Model 279/279A should be terminated with ST connectors. Power for the Model 279/279A is derived from the supplied wall adapter. This power supply is plugged into the Model 279/279A using the 1.3 mm power jack.

4.0 Operation

In fiber optic systems that do not offer DC response there usually is a clock signal which is always being transmitted. The presence of this clock signal allows automatic gain-control circuitry to adjust the gain of the receiving amplifier to compensate for single-mode cable loss. Because the Model 279 can operate at DC, it is necessary to establish a different method to compensate for the length of the single-mode cable. In the Model 279 this is accomplished using a four-position switch, labeled "Line Loss" to allow selection of amplifier gain to accommodate single-mode cable losses of 2, 5, 10 and 15 dB. These losses approximate cable lengths of 3, 7.5, 15 and 26 k, respectively. The method of setting the switch is as follows:

1. With the Model 279 installed, set the "Line Loss" switch to a position where the received data is no longer detectable.
2. Position the switch to the previous dB loss position. Because the switch position is not apparent, the selection is indicated on the LED display.

Note: The functions of TD (transmit data) and RD (receive data) are arbitrary, depending on the users implementation; therefore, the data LED's are not marked.

5.0 Troubleshooting

The following is a list of possible problems that may arise during the installation:

1. The data being received is garbled.

Possible reason/solution:

- a) The "Line Loss" switch is not set for the loss of the cable (see section 4.0, "Operation").

2. No data is being received.

Possible reason/solution:

- a) The customer equipment is not connected to the unit.
- b) The transmit and receive cables are improperly connected.
- c) The power adapter is not connected.
- d) The link connection exceeds maximum specified distance.

If the unit is believed to be defective, operation can be verified if one of the devices to which the converter is attached is capable of operating in a full-duplex mode (such as a terminal). Connect a loopback, short-fiber cable of the correct type, between the T and R fiber connectors, and verify data transmission.

If the Model 279/279A is functioning correctly, any data entered on the keyboard should appear on the screen.

6.0 Power

Power for the Model 279/279A is supplied by a wall adapter that generates +12 VDC. The wall adapter is available for 110 V, 60 Hz or 220 V, 50 Hz. The part numbers are:

110 V: 1510-0033

220 V: 1510-0034

For applications where only DC voltages are available Telebyte offers its DC Adapter, Model 1510-0037, which accepts a voltage source of +18 V to +36 V and generates the required +12 V needed by the Model 279/279A.

