Miniature
Synchronous/Asynchronous
Fiber Optic Modems

ME1570A-FST, ME1570A-MST

1. Features

Miniature synchronous/asynchronous fiber optic modems:

- Synchronous or asynchronous operation

- Data rates up to 38.4 kbps

- Supports transmission over multimode fiber

- V.54 diagnostics, including local and remote tests

- Full or half duplex

- Plugs directly into the RS-232/V.24 connector

- Internal, external, or receive clock

- Ruggedized metal enclosure

- No AC power required

- Miniature, lightweight, easy to install.

Versions

The following versions of the modem are available:

- ME1570A-FST – modem with female DTE connector

- ME1570A-MST – modem with male DTE connector.
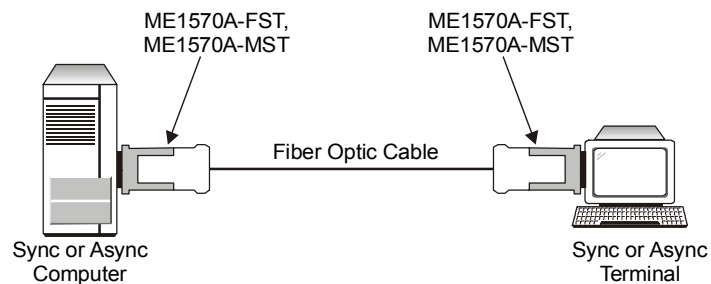
Application

Figure 1. Typical Application

2. Description

ME1570A-FST and ME1570A-MST are synchronous/asynchronous fiber optic modems that are used for local data distribution, connecting full or half duplex sync or async DTEs to other DTEs, over fiber optic cable. The modems operate at data rates up to 38.4 kbps.

Asynchronous transmission is provided by internal conversion from async to sync in compliance with ITU V.22 bis standard. Different async formats are user-selectable.

ME1570A-FST and ME1570A-MST operate with 850 nm LED transmitter over multimode fiber optic cables.

In the synchronous mode, transmit timing is provided by three alternative sources:

• Internal oscillator

• External, derived from the DTE

• Loopback, derived from the receive signal.

The modem's carrier can be strapped for either continuous operation, or for switched operation. In switched operation, the carrier is controlled by the RTS signal, and enables transfer of a control signal end-to-end.

ME1570A-FST and ME1570A-MST perform diagnostic loopbacks in compliance with ITU V.54 standard. Two V.54 loopbacks are available:

• Local analog loop (V.54 Loop 3)

• Remote digital loop (V.54 Loop 2).

The loopbacks are activated by DTE interface signals Circuit 141 (pin 18) and Circuit 140 (pin 21).

Innovative circuitry design allows operation without a power supply, by using ultra-low power from the standard RS-232/V.24 data and control signals. For proper operation, both data and at least one control signal must be connected. i.e. Transmit Data, Receive Data, Signal Ground, and either RTS or DTR.

3. Technical Specifications

Fiber Optic Interface	*Transmitter Type*	850 nm LED
	Cable Type	Multimode
	Transmission Mode	Synchronous or asynchronous, half or full duplex
	Receiver Sensitivity	-45 dBm
	Optical Output	-30 dBm into 100/140 µm fiber
		-32 dBm into 62.5/125 µm fiber
	Connector	ST

DTE Interface	*Interface*	RS-232/V.24
	Data Rate (Sync/Async)	2.4, 4.8, 7.2, 9.6, 14.4, 19.2, 28.8, 38.4 kbps
	Number of Data Bits (Async)	8, 9, 10, or 11 including 1 start and 1 stop bit, with or without parity
	Frequency Allowance (Async)	Shortening of stop bit on receive end is user-selectable:
		• 12.5% allows frequency difference between the async terminal and the modem of -2.5% to +1.0%
		• 25% allows frequency difference of -2.5% to +2.3%
	Control Signals	**DCD** (Circuit 109) turns ON after recognizing receive signal from the line. **CTS** (Circuit 106) turns ON 0, 4, or 32 msec (selectable) after the terminal raises RTS (Circuit 105). **DSR** (Circuit 107) is ON when the modem is powered. **Test Mode** (Circuit 142) turns ON when the modem is in one of its diagnostic loopbacks.
	RTS/CTS Delay	0, 8, or 64 msec
Power		None required; use ultra-low power from the RS-232/V.24 data and control signals.
		To ensure proper operation, the equipment connected to the modem should provide at least one of the following signals: RTS (Circuit 105) or DTR (Circuit 108.2). The typical power consumption drawn from the DTE is 75 mW (at +6V signal level).
Physical	*Height*	23 mm / 0.9 in
	Width	53 mm / 2.1 in
	Depth	110 mm / 4.3 in
	Weight	140g / 4.9 oz
Environment	*Temperature*	0–50°C (32–122°F)
	Humidity	Up to 90%, non-condensing

4. Installation

Caution   This is a delicate instrument. Be careful when setting jumpers or performing any actions within the product so that you do not break or shake any components.

1. Installation of the modems is simple and straightforward, just follow these steps:

2. Release the four screws located at the bottom cover of the modem.

3. Separate the two covers of the case.

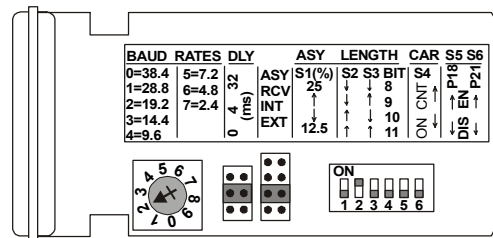4. Set internal jumpers and switches according to *Figure 2*, *Table 1* and *Table 2*.

Figure 2. Jumper and Switch Locations

Table 1. Setting Internal Jumpers and Switches

Jumper/Switch	Function	Possible Settings			Default Setting
Baud Rate rotary switch	Selects data transmit rate (kbps)	**0** – 38.4 **1** – 28.8 **2** – 19.2 **3** – 14.4 **4** – 9.6 **5** – 7.2 **6** – 4.8 **7** – 2.4			9.6
RTS/CTS Delay jumper	Selects RTS/CTS delay	**0** – 0 msec **4** – 4 msec **32** – 32 msec			4
Clock Mode jumper	Selects timing clock (in sync mode) or async mode	**ASY** – Asynchronous mode **RCV** – Receive clock (sync) **INT** – Internal clock (sync) **EXT** – External clock (sync)			INT
Stop Bit Shortening DIP switch	Selects the amount of stop bit shortening in async mode	**S1** **ON** – 25% **OFF** – 12.5%			OFF
Character Length DIP switch	Selects character length in async mode (see *Table 2*)	**S2** OFF OFF ON ON	**S3** OFF ON OFF ON	**No bits** 8 9 10 11	10

Table 1. Setting Internal Jumpers and Switches (Cont.)

Jumper/Switch	Function	Possible Settings	Default Setting
Carrier DIP switch	Selects carrier mode	**S4** **ON** – Follows RTS line **OFF** – Constantly ON	OFF
Pin 18 DIP switch	Enables DTE control of analog loop	**S5** **ON** – Enabled **OFF** – Disabled	OFF
Pin 21 DIP switch	Enables DTE control of remote loop	**S6** **ON** – Enabled **OFF** – Disabled	OFF

Table 2. Selecting Asynchronous Character Length

Start Bit	Data Bits	Parity	Stop Bit	Number of Bits	DIP Switch Setting	
					S2	S3
1	5	None	2	8	OFF	OFF
1	6	None	1 1.5 2	8	OFF	OFF
1	6	Odd, Even	1 1.5 2	9	OFF	ON
1	7	None	1 1.5 2	9	OFF	ON
1	7	Odd, Even	1 1.5 2	10	ON	OFF
1	8	None	1 1.5 2	10	ON	OFF
1	8	Odd, Even	1 1.5 2	11	ON	ON

5. Close the unit by pressing the two halves of the cover together. Fasten the four screws.

6. Plug the modem directly into the 25-pin connector of the DTE or computer port. Fasten the screws on each side of the modem connector.

7. Remove the plastic dust caps from the fiber optic connectors and connect the fiber optic cable to the unit in the following manner:

   ▪ Connect local TX to remote RX

   ▪ Connect local RX to remote TX.

5. Operation

Normal Operation

Make sure the loopback is not activated (pin 18 and pin 21 should not be connected or have negative voltages).

Test Mode

The modems perform two of the V.54 test loopbacks. *Figure 3* illustrates analog loopback (ANA) (V.54 Loop 3) and *Figure 4* shows remote digital loopback (REM) (V.54 Loop 2). Both loopbacks are controlled by DTE interface pin 18 (ANA) and pin 21 (REM). When the modem performs one of its diagnostic loopbacks, pin 25 (Circuit 142) is set to ON.

Local   Remote

ME1570A-FST,   ME1570A-FST,
ME1570A-MST   ME1570A-MST

Figure 3. Local Analog Loopback

Local   Remote

ME1570A-FST,   ME1570A-FST,
ME1570A-MST   ME1570A-MST

Figure 4. Remote Digital Loopback