BLACK BOX®
NETWORK SERVICES

JULY 2003

ME1735A-F ME1735A-M

Miniature Synchronous Multipoint Modems

CUSTOMER SUPPORT INFORMATION

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ME1735A-F, ME1735A-M

1. Features

Miniature synchronous multipoint modems:

- Transmission data rates up to 19.2 kbps, synchronous
- Full or half duplex, point-to-point or multipoint
- Internal or external clock
- Transmission range up to 14.5 km (9.1 miles)
- Transformer isolated
- No AC power required
- Compact, lightweight
- Easy to install.

Versions

The following versions of the modem are available:

- ME1735A-F – modem with female DTE connector
- ME1735A-M – modem with male DTE connector.

Application

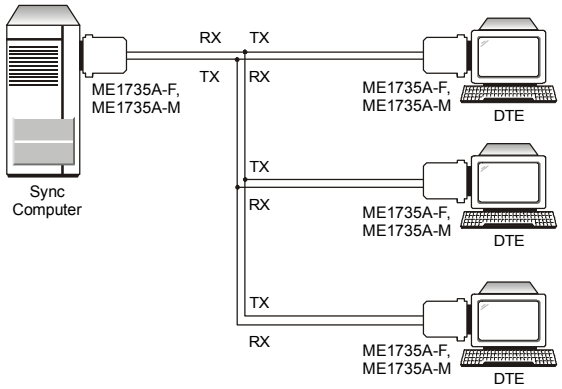

Figure 1. Typical Application

2. Description

ME1735A-F and ME1735A-M modems are used for local data distribution, connecting full or half duplex synchronous DTEs or controllers to computers. A pair of modems ensures integrity of data transmission over unconditioned 4-wire dedicated lines, for distances up to 14.5 km (9.1 miles), depending on the wire gauge and data rate (see *Table 1* and *Table 2*).

Table 1. Typical Transmission Ranges, Point-to-Point Application

Data Rate	19 AWG		24 AWG		26 AWG	
[kbps]	[km]	[miles]	[km]	[miles]	[km]	[miles]
1.2, 2.4	14.5	9.1	6.5	4.0	4.8	3.0
4.8	13.5	8.5	6.0	3.8	4.5	2.8
9.6	11.2	7.0	5.0	3.1	3.8	2.4
19.2	10.0	6.2	4.5	2.8	3.4	2.0

Table 2. Typical Transmission Ranges, Multipoint Application, 24 AWG Line

Data Rate	Number of Slaves					
[kbps]	3		5		7	
	[km]	[miles]	[km]	[miles]	[km]	[miles]
1.2	5.8	3.6	4.2	2.6	3.4	2.1
2.4	5.7	3.5	3.9	2.4	3.4	2.1
4.8	4.7	2.9	3.2	2.0	2.9	1.8
9.6	3.9	2.4	2.9	1.8	2.3	1.4
19.2	2.3	1.4	1.5	0.9	1.3	0.8

Transmit timing is provided by three alternative sources:

- Internal oscillator
- External clock from the DTE, via pin 24
- Loopback clock derived from the receive signal.

The carrier can be set for either continuous operation (point-to-point applications) or for switched operation, controlled by the RTS signal (multipoint applications). The LED indicator lights upon Carrier Detect.

Innovative circuitry allows the modems to operate without connection to the mains supply, by using ultra-low power from the data and control signals.

The low transmit level minimizes crosstalk onto adjacent circuits within the same cable. Data is transmitted and received using a balanced interface, ensuring high immunity to circuit noise.

Coupling to the dedicated line is through isolation transformers which, in conjunction with other circuitry, protect against AC or DC overvoltages. The transformers are rated at over 1,500 VRMS, enabling connection of the modems to the local circuits provided by most national telephone administrations (PTTs).

Table 3. Line Connector Pinout (RJ-45)

Pin	Function
1	Not connected
2	Ground
3	RCV-
4	XMT-
5	XMT+
6	RCV+
7	Not connected
8	Not connected

3. Technical Specifications

Line Interface	*Line Type*	4-wire unconditioned dedicated line (two twisted pairs)
	Transmission Mode	Synchronous, full or half duplex
	Transmission Level	0 dBm
	Typical Range	See *Table 1* and *Table 2*
	LED	ON – Carrier Detect is ON
	Connector	5-screw terminal block and RJ-45
DTE Interface	*Type*	RS-232/V.24
	Control Signals	**DCD** (Circuit 109) turns on after recognizing the receive signal from the line **CTS** (Circuit 106) turns on 7 msec after the DTE raises RTS (Circuit 105)
	Data Rate	Up to 19.2 kbps, user-selectable
	Connector	• ME1735A-F: D-type, 25-pin, female • ME1735A-M: D-type, 25-pin, male
Power		For proper operation, at least two of the following DTE connector (DB-25) pins must be connected: 2, 4, 20 and 24. The typical power consumption drawn from the DTE (at +6V signal level) is 55 mW
Physical	*Height*	22 mm / 0.9 in
	Width	53 mm / 2.1 in
	Depth	61 mm / 2.4 in
	Weight	90g / 3.3 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.

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

1. Snap out the nameplate.
2. Configure the modem according to your requirements. Refer to *Figure 2* to locate the internal switches and to *Table 4* for the possible settings.

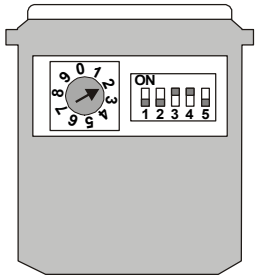

Figure 2. Internal Switch Locations

Table 4. Internal Switch Settings

Jumper	Function	Possible Settings	Default Setting
Data Rate, rotary switch	Selects data rate	**0** – 19.2 kbps **1** – 14.4 kbps **2** – 9.6 kbps **3** – 7.2 kbps **4** – 4.8 kbps **5** – 3.6 kbps **6** – 2.4 kbps **7** – 1.8 kbps **8** – 1.2 kbps	2
Clock, SW1, SW2, SW3	Selects timing mode	**S1** **S3** **S3** **ON** **OFF** **OFF** External **OFF** **OFF** **ON** Internal **OFF** **ON** **OFF** Receive	Internal
Carrier Control, SW4	Selects the carrier to be constantly ON or controlled by RTS	**ON** – Constantly ON **OFF** – Controlled by RTS	ON
RTS/CTS Delay, SW5	Selects RTS/CTS delay	**ON** – 50–70 msec **OFF** – 6–8 msec	OFF

3. Close the unit by snapping the nameplate back into place.

4. Connect the 4-wire line to the terminal block connector. Observe the following pin polarity between the local and remote units:
   - Local XMT (+) connected to remote RCV (+)
   - Local XMT (-) connected to remote RCV (-)
   - Local RCV (+) connected to remote XMT (+)
   - Local RCV (-) connected to remote XMT (-).

Note *When operating in a noisy environment, use shielded cables, and connect the cable shield to the GND terminal (see Figure 2).*

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