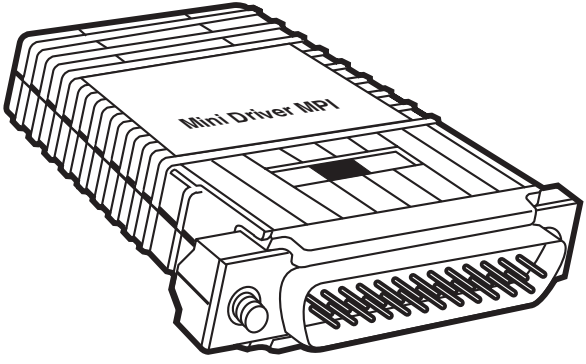
BLACK BOX®
NETWORK SERVICES

DECEMBER 2000
ME764A-MSP
ME764A-FSP

Mini Driver MPI



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FEDERAL COMMUNICATIONS COMMISSION AND CANADIAN DEPARTMENT OF COMMUNICATIONS RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par le ministère des Communications du Canada.

CONTENTS

1.0 Specifications

Protocol — Asynchronous

Speed — Up to 19.2 Kbps

Distance —

	Wire Gauge		
Speed (bps)	19	24	26
19,200	6.2 mi (10.0 km)	3.7 mi (6.0 km)	1.2 mi (1.9 km)
9600	7.5 mi (12.1 km)	4.9 mi (7.9 km)	2.5 mi (4.0 km)
4800	8.7 mi (14.0 km)	5.6 mi (9.0 km)	3.7 mi (6.0 km)
2400	11.8 mi (19.0 km)	8.0 mi (12.9 km)	4.9 mi (7.9 km)
1200	17.0 mi (27.4 km)	11.8 mi (19.0 km)	8.0 mi (12.9 km)

Surge Protection — 600W power dissipation at 1 ms and response time less than 1.0 picoseconds

Operation — 4-wire full- or half-duplex, DCE/DTE switch-selectable

Connectors — (1) DB15 male or female; (1) S-screw terminal block

Distance — Up to six miles (9.7 km)

Power — No power required; uses ultra-low power (5 volts required, with current draw of 3 to 5 mA at 10 volts) from EIA data and control signals: Pins 3, 5, 6, 8, and 9 in DTE mode, Pins 2, 4, 9, and 20 in DCE mode

Size — 2.7"H x 2.1"W x 0.7"D (6.9 x 5.3 x 1.8 cm)

Temperature — 32° to 140° F (0° to 60° C)

Humidity — 95% non-condensing

Note: The Mini Driver MPI must be used in pairs.

2.0 Description

The Mini Driver MPI was designed for point-to-point or multidrop applications that require control signals for hardware handshaking. In a multipoint environment, the master transmits data in parallel to up to 10 addressable terminals. The terminals contend for the main channel by activating RTS (Pin 4).

Built-in transformers eliminate much of the noise that occurs in commercial buildings. These transformers also eliminate ground loops caused by differences in reference ground, so you can use the Drivers to connect devices in separate buildings.

The Driver uses the latest in bi-directional, clamping, transient suppressors to protect itself and connected equipment from harmful transient surges. The units can dissipate 600W per wire at 1 ms. Response times are typically 1 picosecond from 0 to the nominal breakdown level of 6.8 volts.

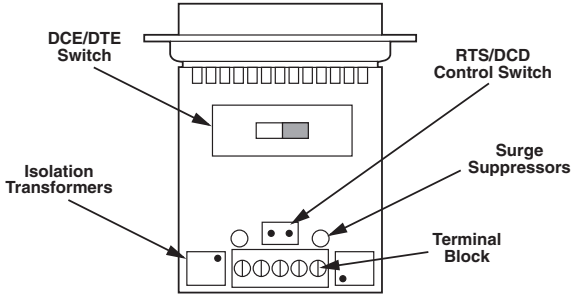
Features

- Lets up to 10 terminals use a single port in an asynchronous polling system.
- Transmits and receives one control signal each way for systems or equipment requiring hardware handshaking.
- Full- or half-duplex, point-to-point or multipoint operation.
- Includes an external DCE/DTE switch.
- Transformer isolated data line eliminates ground loops and protects the Driver from power surges.
- No AC power required. Draws power from the RS-232 interface.
- Supports speeds of up to 19.2 Kbps.
- Supports distances of up to 6 miles (9.7 km).
- Available with modular jacks (RJ-11 or RJ-45) or terminal posts for twisted-pair connections.
- Made in the U.S.A.

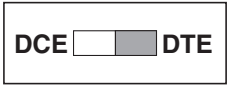
3.0 Configuration

3.1 Switch settings

The locations of the switches, line connections, and surge suppressors are shown in the following diagram.

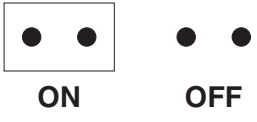


DCE/DTE switch: Thanks to an external DCE/DTE switch, the Driver can be used with computers/ terminals (DTE) or with modems (DCE). When used with a DTE, the Driver should be set to DCE (factory setting). When used with a DCE, the setting should be DTE.



Note: The DCE/DTE switch does more than swap pins 2 and 3—it also changes the power-requirement pins. See the Appendix for DCE and DTE pinouts.

Carrier control switches: The RTS/DCD control strap setting on the Driver determines how its transmitter (carrier) is activated. When this strap is off (removed from the pins) the Driver transmitter is constantly on. When the strap is on, the transmitter is enabled by activating RTS (Pin 4 or Pin 8 as described in the table below). The table that follows summarizes how the Driver transmitter is activated.



DCE/DTE Switch Setting	DCE	DTE
RTS/DCD strap on	RTS Activated	DCD Activated
RTS/DCD strap off	Carrier Constantly High	Carrier Constantly High

3.2 Using the RJ-11 and RJ-45 jacks

The RJ-11 or RJ-45 jacks on the Driver are prewired for a standard AT&T® wiring environment. To be sure you have the right wiring, use the table below as a guide.

RJ-11	Signal
1	GND*
2	RCV-
3	XMT+
4	XMT-
5	RCV+
6	GND*

RJ-45	Signal
1	N/C
2	GND*
3	RCV-
4	XMT+
5	XMT-
6	RCV+
7	GND*
8	N/C

4-Wire Connections

When you use the modular connectors in 4-wire mode, you must cross over the cabling between the Drivers. Use this chart as a guide:

Signal	Pin #	Color**	Color	Pin #	Signal
GND*	1	Blue	White	6	GND*
RCV-	2	Yellow	Red	4	XMT-
XMT+	3	Green	Black	5	RCV+
XMT-	4	Red	Yellow	2	RCV-
RCV+	5	Black	Green	3	XMT+
GND*	6	White	Blue	1	GND*

* Connection to ground is optional.

** These are standard color codes. Your colors may be different.

Note: In multidrop applications using dual modular connectors it, is only necessary to cross the cabling between the master and the first slave. All other connections between slaves should be straight through.

3.3 Using the Terminal Blocks

The following instructions show how to connect the twisted-pair wires to the terminal posts.

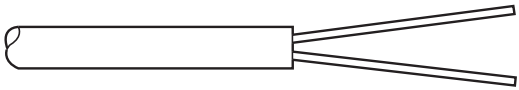
Open the Drivers and connect the 4-wire telephone line between transmit (XMT) and receive (RCV) pairs being careful to observe polarity.

- XMT+ on the local Driver to RCV+ on the remote Driver(s).
- XMT- on the local Driver to RCV- on the remote Driver(s).
- RCV+ on the local Driver to XMT+ on the remote Driver(s).
- RCV- on the local Driver to XMT- on the remote Driver(s).

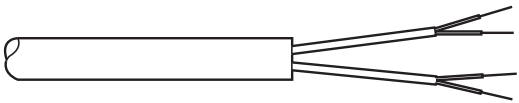
Note: If there is a shield around the telephone cable, it may be connected to “G” on the terminal block. We recommend connecting the shield only at the computer end to avoid ground loops. A ground wire is not necessary to properly operate these Drivers. If you have trouble wiring the Driver or putting it together using the strain-relief assembly (included), please see the next section.

3.4 Installing the Strain Relief

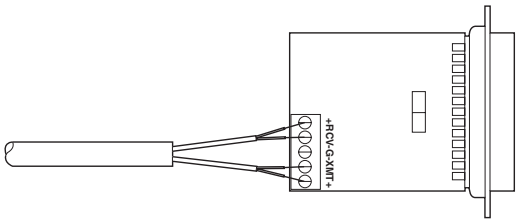
1. Strip the outer insulation from the twisted-pair wires about one inch (2.5 cm) from the end.



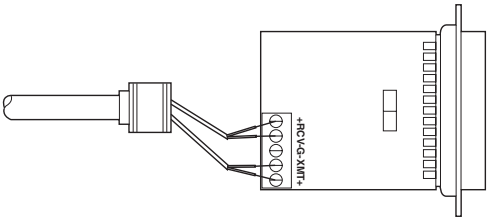
2. Strip the insulation from each of the twisted-pair wires about 1/4 inch (0.6 cm).



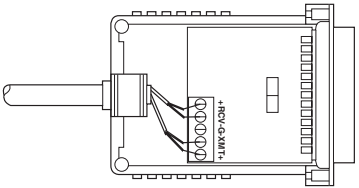
3. Insert the proper terminal post and tighten the screw (see **Section 3.3**).



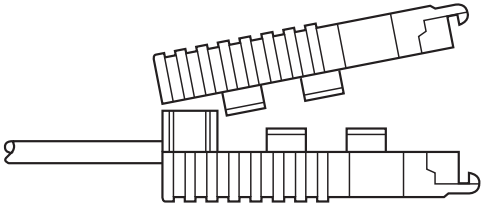
4. Place the two halves of the strain-relief assembly on either side of the telephone wire and press together very lightly. Slide the assembly so that it is about 2 inches (5 cm) from the terminal posts and press together firmly.



5. Insert the strain-relief assembly, with the wire going through it, into the slot in the bottom half of the modem case and seat it into the recess in the case. If the telephone wire is too thin to be held by the strain relief assembly, use tape to increase its diameter. If the wire is too large, you may have to drill out the strain relief slightly.



6. Bend the top half of the case as necessary to place it over the strain relief assembly. Do not snap the case together.



7. Insert one captive screw through a saddle washer and then insert the captive screw with the washer on it, through the hole in the DB25 end of the case. Snap that side of the case closed. Repeat the process for the other side.

The cable installation is now complete.

3.5 Connection to the RS-232 Interface

Once you've configured the Driver for DTE or DCE and connected the twisted-pair wires, simply plug the Driver directly into the DB25 port of the RS-232 device. Remember to insert and tighten the two captive connector screws.

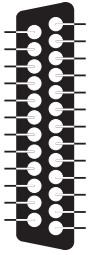
Note: If you must use a cable to connect the Driver to the RS-232 device, make sure it is a straight-through cable of the shortest possible length. We recommend 6 ft. (1.8 m) or less.

3.6 Operating the Mini Driver MPI

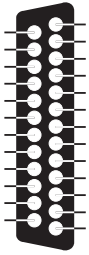
Once you've installed the Driver, it should operate transparently—as if it were a standard cable connection. It derives operating power from the RS-232 data and control signals. There is no ON/OFF switch.

Appendix: RS-232 Pin Configurations

DIRECTION	STANDARD "DCE" SETTING	DIRECTION
To Mini Driver	Data Term. Ready (DTR) - 20 1- (FG) Frame Ground 2- (TD) Transmit Data 3- RD) Receive Data 4- (RTS) Request to Send 5- (CTS) Clear to Send 6- (DSR) Data Set Ready 7- (SG) Signal Ground 8- (DCD) Data Carrier Detect	To Mini Driver From Mini Driver To Mini Driver From Mini Driver From Mini Driver From Mini Driver



DIRECTION	STANDARD "DTE" SETTING	DIRECTION
From Mini Driver	Data Term. Ready (DTR) - 20 1- (FG) Frame Ground 2- (TD) Transmit Data 3- RD) Receive Data 4- (RTS) Request to Send 5- (CTS) Clear to Send 6- (DSR) Data Set Ready 7- (SG) Signal Ground 8- (DCD) Data Carrier Detect	From Mini Driver To Mini Driver From Mini Driver To Mini Driver To Mini Driver To Mini Driver



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