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ME862A-FSP-R2

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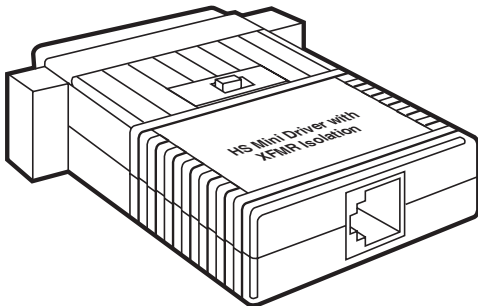
ME862A-MSP-R2

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High Speed Mini Driver with Transformer Isolation and Surge Protection



CUSTOMER SUPPORT INFORMATION

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1. Specifications

Data Rates	Up to 115.2 kbps
Transmission Format	Asynchronous, full duplex
Transmission Line	(2) Unconditioned twisted pair, 19 to 26 AWG
Interfaces	EIA RS-232, CCITT V.24
Connectors	DB25 male or female on RS-232 side; RJ-11 (ME862A-R2), RJ-45 (ME863A-R2), or terminal block with strain relief (ME864A-R2) on line side
Isolation	Minimum 1500 V RMS using custom transformers
Surge Protection	600W power dissipation at 1 millisecond and response time of 1 picosecond

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Factory Switch Setting	DCE (transmits from RS-232 on pin 3)
Power Supply	None required; uses power from EIA data and control signals (TD, RTS, DTR)
Control Signals	DSR and DCD follow DTR from the terminal (DTE); CTS follows RTS from the terminal (DTE)
Compliance	CE
MTBF	389,468 hours
Temperature	32 to 140°F (0 to 60°C)
Humidity	Up to 95%, noncondensing
Altitude	Up to 15,000 feet (4570 m)
Size	2.66"H x 2.1"W x 0.73"D (6.76 x 5.3 x 1.9 cm)
Weight	2 oz. (56.7 g)

Rates

High Speed Mini Driver Distance Table: miles (km)			
Data Rate	Wire Gauge		
	19	24	26
115,200	0.6 (1)	0.45 (0.7)	0.3 (0.5)
57,600	2 (3.2)	1.5 (2.4)	1 (1.6)
38,400	2.4 (3.9)	1.8 (2.9)	1.2 (1.9)
19,200	2.6 (4.2)	2 (3.2)	1.2 (1.9)
9600	4 (6.4)	2.5 (4)	1.6 (2.6)
4800	5 (8)	3.5 (5.6)	2.2 (3.5)
2400	6.8 (10.9)	4.7 (7.6)	3.2 (5.1)
1200	8.5 (13.2)	5.7 (9.2)	3.8 (6.1)

2. Introduction

The High Speed Mini Driver with Transformer Isolation and Surge Protection is a self-powered, transformer-isolated, short-range modem that lets two asynchronous RS-232 devices communicate between buildings, over two twisted pairs. Supporting asynchronous data rates to 115.2 kbps, the High Speed Mini Driver derives the necessary power for operation from the data and control voltages on the RS-232 interface. DC transformer isolation on the line side gives the High Speed Mini Driver immunity to ground loops that would otherwise hamper between-building communications.

An external DCE/DTE switch lets you connect to the serial port of either a computer/terminal (DTE) or a modem (DCE) without using a crossover cable. The High Speed Mini Driver is available with three 4-wire interface options: RJ-11 (ME862A-R2), RJ-45 (ME863A-R2), or terminal blocks with strain relief (ME864A-R2).

The High Speed Mini Driver also incorporates high-speed avalanche diodes that intercept data-line transient surges and shunt them safely to chassis ground. With surge-handling capacity of 600W per wire at 1 ms, the High Speed Mini Driver can protect itself and connected equipment from nearby lightning strikes and other surges of electromagnetic radiation.

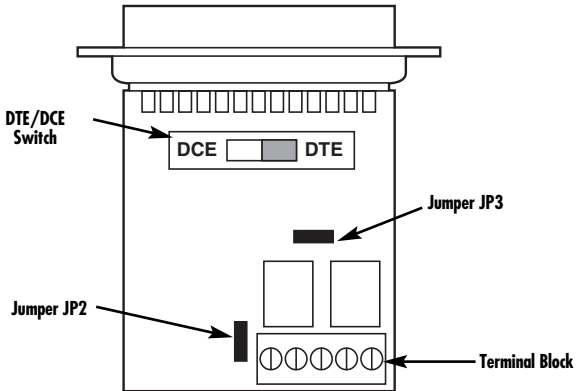
IMPORTANT!

The High Speed Mini Drivers must be used in pairs.

3. Configuration

3.1 Overview

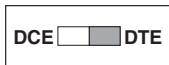
The High Speed Mini Driver is configured using an external DCE/DTE switch and two internal jumpers (the factory jumper settings are appropriate for most applications). This section describes the configuration switch and jumpers and shows factory defaults. The figure on the next page shows the location of the switch/jumpers on the internal PC board.



3.2 Setting the DCE/DTE Switch

For your convenience, the High Speed Mini Driver has an externally accessible DCE/DTE switch (see the diagram above). If the device connected to the Mini Driver is a modem or multiplexor (or is wired like one), set the switch to “DTE.” This setting causes the Mini Driver to behave like Data Terminal Equipment and transmit data on pin 2.

If the device connected to the High Speed Mini Driver is a PC, terminal, or host computer (or is wired like one), set the switch to “DCE.” This setting causes the Mini Driver to behave like Data Communications Equipment and transmit data on pin 3.



3.3 Selecting “High Speed” versus “Low Speed” Operation

The High Speed Mini Driver can be set for “High Speed” (2400 bps to 115.2 kbps) or “Low Speed” (1200 bps to 57.6 kbps) RS-232 operation. The table below shows data jumper settings, including factory defaults.

NOTE

When using the High Speed Mini Driver with an older version of the High Speed Mini Driver, you must set the jumpers for Low Speed operation.

Table 3-1. Interface Card Jumper Summary
(Bold type indicates the factory default.)

Jumper	Function	High Speed	Low Speed
JP2	Data Rate	Jumper OFF	Jumper ON
JP3	Data Rate	Position 2&3	Position 1&2

3.3.1 JUMPER JP2

Jumper JP2 is set in conjunction with jumper JP3 to place the High Speed Mini Driver in either High or Low Speed operating mode. For the High Speed setting (the factory default), jumper JP2 should be placed on *only one* of the two pins. This is defined as “Jumper OFF.” For the Low Speed setting, jumper JP2 should be placed on *both* of the pins. This is defined as “Jumper ON.”

3.3.2 JUMPER JP3

Jumper JP3 is set in conjunction with Jumper JP2 to place the High Speed Mini Driver in either “High Speed” or “Low Speed” operating mode. For the High Speed setting (the factory default), jumper JP3 should be placed on pins 2 and 3. For the Low Speed setting, jumper JP3 should be placed on pins 1 and 2. “Jumper OFF” is not a valid option.

4. Installation

Once you have properly configured the DCE/DTE switch, you are ready to connect the High Speed Mini Driver to your system.

4.1 Connection to the Twisted-Pair Interface

The High Speed Mini Driver supports data-only communication between two RS-232 devices. There are two essential requirements for installing the High Speed Mini Driver:

1. *These units work in pairs.* Therefore, you must have one High Speed Mini Driver at each end of a two-twisted-pair interface.
2. To function properly, the High Speed Mini Driver needs two twisted pairs of metallic wire. These pairs must be *unconditioned*, dry metallic wire, between 19 and 26 AWG (the higher-number gauges may limit distance somewhat). Standard dial-up telephone circuits, or leased circuits that run through signal-equalization equipment, are not acceptable.

For your convenience, the High Speed Mini Driver is available with three different twisted-pair interfaces: RJ-11 jack (ME862A-R2), RJ-45 jack (ME863A-R2), and terminal blocks with strain relief (ME864A-R2).

4.1.1 TWISTED-PAIR CONNECTION USING RJ-11 OR RJ-45

The RJ-11 and RJ-45 connectors on the High Speed Mini Driver's twisted-pair interface are prewired for a standard telco wiring environment. The signal/pin relationships are shown below.

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

*Connection to ground is optional

When connecting two High Speed Mini Drivers, it is necessary to use a crossover cable. The diagram on the next page shows how a crossover cable should be constructed for an environment where both High Speed Mini Drivers use a 6-wire RJ-11 connector. Similar logic should be followed when using RJ-45 connectors or a combination of the two.

HIGH SPEED MINI DRIVER

<u>Signal</u>	<u>Pin No.</u>	<u>Color*</u>	<u>Color</u>	<u>Pin No.</u>	<u>Signal</u>
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

*Standard AT&T color codes—yours may be different



- 1 - Blue
- 2 - Yellow
- 3 - Green
- 4 - Red
- 5 - Black
- 6 - White



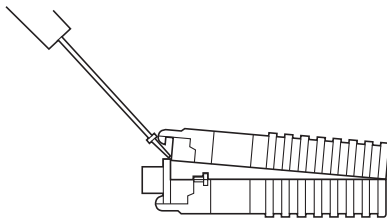
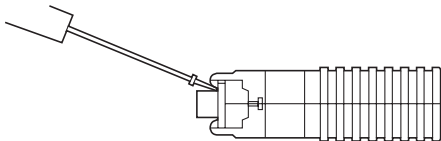
- 1 - Blue
- 2 - Orange
- 3 - Black
- 4 - Red
- 5 - Green
- 6 - Yellow
- 7 - Brown
- 8 - Slate

4.1.2 TWISTED-PAIR CONNECTION USING TERMINAL BLOCKS

If your RS-422 application requires you to connect two pairs of bare wires to the High Speed Mini Driver, you will need to open the case to access the terminal blocks. This section tells you how to open the case, connect the bare wires to the terminal blocks, and fasten the strain-relief collar in place so that the wires won't pull loose.

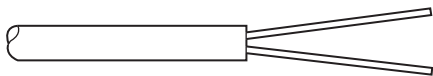
1. Open the unit by gently inserting a screwdriver between the DB25 connector and the lip of the plastic case (see the diagram on the next page). You don't have to worry about breaking the plastic, but be careful not to bend the D-sub connector.

HIGH SPEED MINI DRIVER

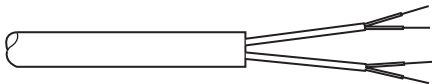


Once the unit has been opened, you will be able to see the terminal blocks located at the rear of the PC board.

- Strip the outer insulation from the twisted pairs about one inch from the end.



- Strip back the insulation on each of the two twisted-pair wires about one quarter of an inch.

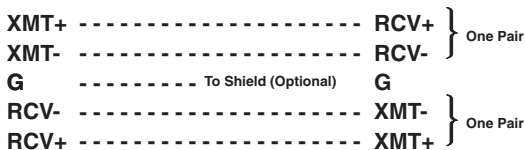


HIGH SPEED MINI DRIVER

4. Connect *one pair of wires* to XMT+ and XMT- (transmit positive and negative) on the terminal block, making careful note of which color is positive, and which color is negative.

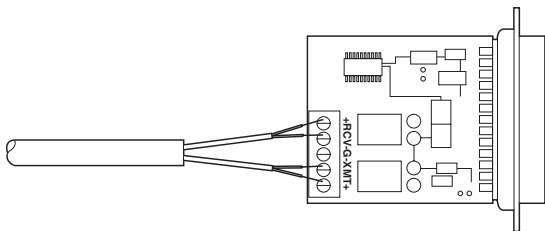
5. Connect *the other pair of wires* to RCV+ and RCV- (receive positive and negative) on the terminal block, again making careful note of which color is positive, and which color is negative.

Ultimately, you will want to construct a two-pair crossover cable that makes a connection with the RS-422 device as shown below:

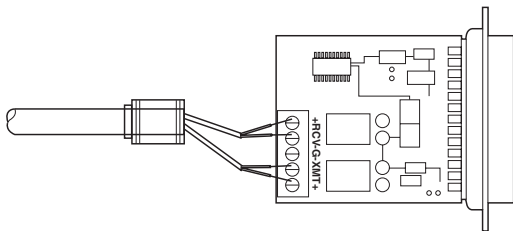


6. If there is a shield around the telephone cable, it may be connected to “G” on the terminal block. To avoid ground loops, we recommend connecting the shield at the computer end only. *A ground wire is not necessary for proper operation of these units.*

7. When you finish connecting the wires to the terminal block, the assembly should resemble the diagram below.

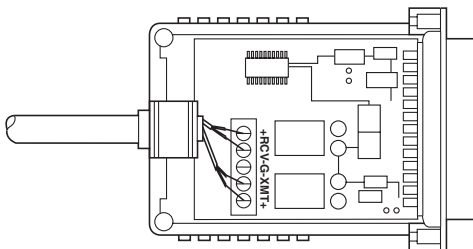


8. Place the two halves of the strain-relief assembly on either side of the telephone wire and press together very lightly. Slide the assembly so that it is about two inches (5.1 cm) from the terminal posts and press together firmly. If your cable diameter is too small or too large for our strain relief, contact your supplier for technical support.

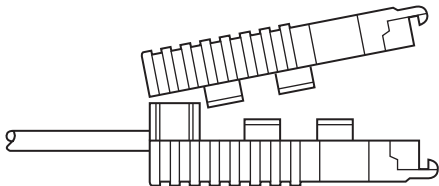


HIGH SPEED MINI DRIVER

9. Insert the strain-relief assembly with the wire going through it into the slot in the bottom half of the modem case and set it into the recess in the case.



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



11. Insert one captive screw through a saddle washer, 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. Cable installation is complete.

4.2 Connection to the RS-232 Interface

Once you have configured the High Speed Mini Driver for DCE or DTE and connected the twisted-pair wires correctly, simply plug the High Speed Mini 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 High Speed Mini Driver to the RS-232 device, make sure it is a straight-through cable of the shortest possible length. (We recommend 6 feet—1.8 m—or less.)

4.3 Operating the High Speed Mini Driver

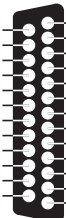
Once the High Speed Mini Driver is properly installed, it should operate transparently—as if it were a standard cable connection. Operating power is derived from the RS-232 data and control signals; there is no ON/OFF switch. All data signals from the

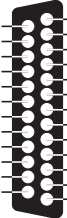
RS-232 interface are passed straight through. All control signals from the RS-232 interface are looped back.

NOTE

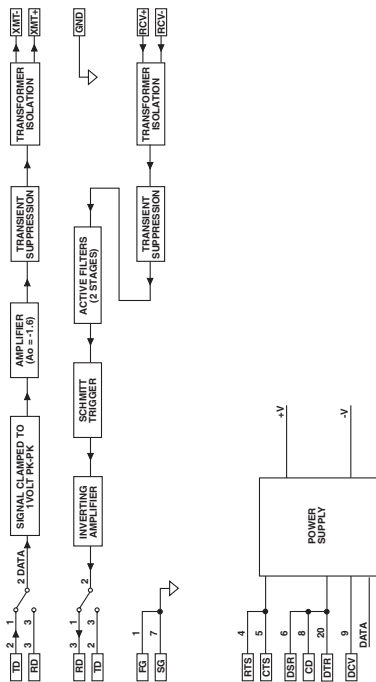
If your system requires hardware flow control, you will need the Mini Driver MPI with Surge Protection (ME764A-R2). Call your supplier for more information.

Appendix A. RS-232C Pin Configurations

DIRECTION	STANDARD "DCE" SETTING	DIRECTION
To Mini Driver	 <p>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</p> <p>Data Term. Ready (DTR) - 20</p>	<p>To Mini Driver From Mini Driver To Mini Driver From Mini Driver From Mini Driver From Mini Driver From Mini Driver</p>

DIRECTION	STANDARD "DTE" SETTING	DIRECTION
From Mini Driver	 <p>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</p> <p>Data Term. Ready (DTR) - 20</p>	<p>From Mini Driver To Mini Driver From Mini Driver To Mini Driver To Mini Driver To Mini Driver To Mini Driver</p>

Appendix B. Block Diagram



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NOTES



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