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MAY 1994
ME731A
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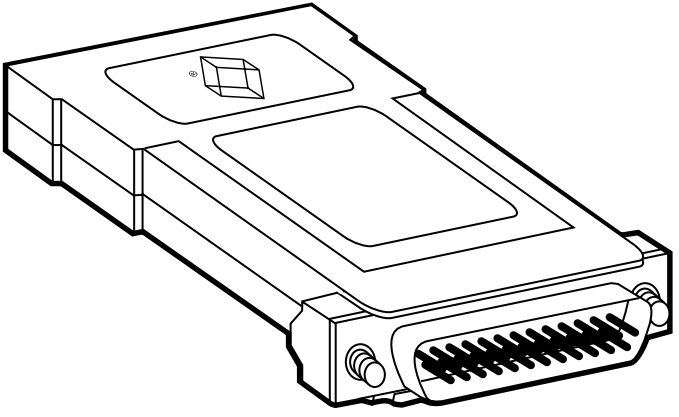
CS Mini Driver-A



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FEDERAL COMMUNICATIONS COMMISSION AND INDUSTRY CANADA 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 Industry Canada

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 Industrie Canada.

CONTENTS

1. Specifications

Protocol — Asynchronous

Speed — Up to 19,200 Kbps (no strapping)

Distance — See Table 1-1 on the next page

Surge Protection (SP models only) — 600W power dissipation at 1 ms and response time of 1.0 picoseconds

Control Signals — DCE Mode: CTS (Pin 5) turns ON immediately after terminal raises RTS (Pin 4); DSR (Pin 6) turns on when powered-up; DCD (Pin 8) turns ON after detecting the receive signal from the line; DTE Mode: RTS (Pin 4) turns ON immediately after modem raises CTS (Pin 5); DTR (Pin 20) turns ON after recognizing the receive signal from the line

Operation — 4-wire unconditioned line (2 twisted-pair wires), full duplex

Transmit Level — 0 dBm

Connectors — (1) DB25 male or female

Line Connection — RJ-11 or RJ-45 jack or 5-screw terminal posts (4 wires, 1 ground) and a strain-relief insert

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

Table 1-1

Power — No power required; uses ultra-low power (5 volts required) from EIA data and control signals—Pins 3, 5, 6, 8, and 9 in DCE mode; Pins 2, 4, 9, and 20 in DTE 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 — Up to 95%, noncondensing

Note: The CS Mini Driver-A must be used in pairs. The CS Mini Driver-A is compatible with the DB9 Microdriver (ME792A-794A) and the Mini Driver MP (ME771A-773A).

2. Description

The CS Mini Driver-A lets you put 17 miles (27.4 km) between your RS-232 UNIX® systems. The Driver uses unconditioned twisted-pair cabling, supports speeds of up to 19.2 Kbps, and requires no AC power or batteries.

A carrier sense feature automatically detects the presence of a carrier on the line, making the Driver ideal for UNIX environments where the host must see a carrier before it sends a log-on screen to a terminal. The carrier sense feature also plays an important role in troubleshooting, where the presence or absence of a carrier indicates positive or negative line integrity.

Small and sturdy, the Driver comes housed in an ABS plastic case. It includes a male or female DB25 connector and a choice of interfaces—RJ-11 jack, RJ-45 jack, or terminal block with strain relief. The SP models incorporate Silicon Avalanche Diodes which give you 600 watts per wire of protection against harmful transient surges.

Features

- Ideal for UNIX operating systems.
- Supports a range of up to 17 miles (27.4 km) at 1200 bps on 19-AWG cable (see **Chapter 1, Specifications**, for a distance table)
- Supports speeds up to 19.2 Kbps.
- Requires no external power supply.
- Includes carrier sense handshaking.
- Perfect for troubleshooting or monitoring a line.
- Housed in a thin case for closely spaced computer ports.
- Available with RJ-11, RJ-45, or terminal block with strain relief.
- Includes an external DCE/DTE switch.
- Connects directly to an RS-232 port.
- SP version features Silicon Avalanche Diodes.
- Compatible with DB9 Microdriver (ME792A-794A) and Mini Driver MP (ME771A-773A).
- Made in the U.S.A.

3. Configuration

Easy to use, the Driver has no internal jumpers or configuration switches to set. The only thing you must do is set the external DCE/DTE switch.

Figure 3.1 below shows the location of the DCE/DTE switch on the PC board, as well as the location of the terminal block and surge suppressors (SP models only).

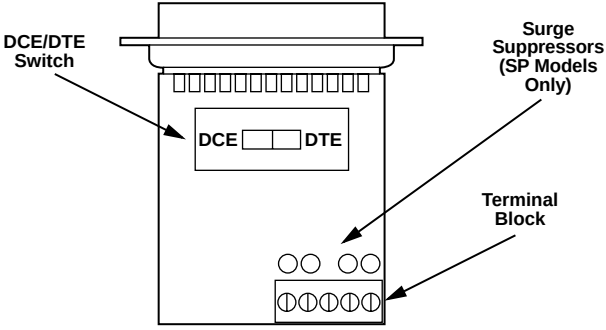


Figure 3-1. Location of the DCE/DTE switch.

Setting the DTE/DCE Switch

The Driver includes an external DCE/DTE switch (see diagram below). If a modem or multiplexor is connected to the Driver (or if the connected device is wired like a modem or mux), set the switch to DTE. On this setting, the Driver will act like a DTE and transmit data on Pin 2.

If a PC, terminal, or host computer is connected to the Driver (or if the connected device is wired like a PC, terminal, or host computer), set the switch to DCE. On this setting, the Driver will act like a DCE and transmit data on Pin 3.

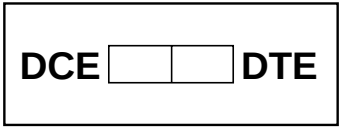


Figure 3-2.

4. Installation

Once you configure the DTE/DCE switch, you're ready to connect the Driver to your network.

The Driver supports data-only communication between two RS-232 devices at distances up to 17 miles (27.4 km) and speeds up to 19.2 Kbps. There are two essential requirements for installation:

1. These units work in pairs. You must have one Driver at each end of a two-twisted-pair interface.
2. To function properly, the Driver needs two twisted pairs of metallic wire. The pairs must be unconditioned, dry metallic wire, between 19 and 26 AWG (higher-number gauges may limit distance; see the distance table in **Chapter 1** for specific distance and AWG recommendations). Do not use standard dial-up telephone circuits or leased circuits than run through signal-equalization equipment.

The Driver comes in your choice of three twisted-pair interfaces—RJ-11 jack, RJ-45 jack, and terminal block with strain relief.

4.1 Twisted-Pair Connection Using RJ-11 or RJ-45

The RJ-11 and RJ-45 connectors on the Driver's twisted-pair interface are prewired for a standard AT&T® wiring environment (see Figure 4.1). The table on page 10 shows signal/pin relationships.

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

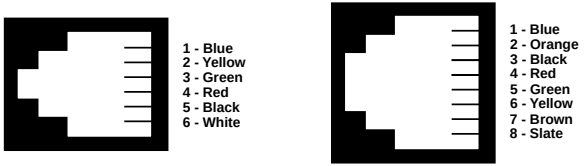


Figure 4-1. AT&T standard modular color codes.

When you connect two CS Mini Driver-A units, you must use a crossover cable. The diagram below shows how you should construct a crossover cable for an environment where both Drivers use a 4-wire RJ-11 connector. Use a similar method when you use an RJ-45 connector or a combination of both RJ-11 and RJ-45.

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.

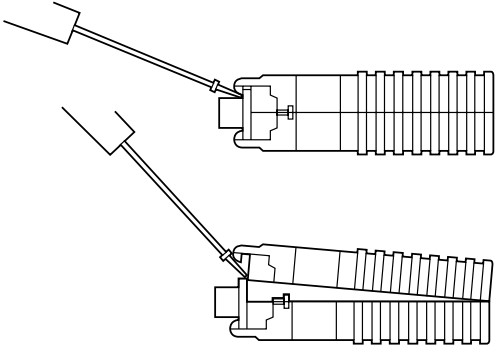
** These are standard AT&T color codes. Your colors may be different.

4.2 Twisted-Pair Connection Using Terminal Blocks

If your RS-232 application requires you to connect two pairs of bar wires to the Driver, you will need to open the case to access the terminal blocks. The following instructions tell you how to open the case,

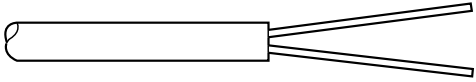
connect the bar wires to the terminal block, and fasten the strain relief in place, so that the wires won't pull loose.

1. Gently open the unit by inserting a screwdriver between the DB25 connector and the lip of the plastic case. You don't have to worry about breaking the plastic, but be careful not to bend the D-sub connector.

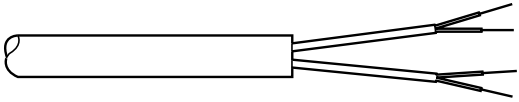


When the unit is open, you'll be able to see terminal blocks located at the rear of the PC board.

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



3. Strip the insulation from each of the twisted-pair wires about ¼ inch (0.6 cm).

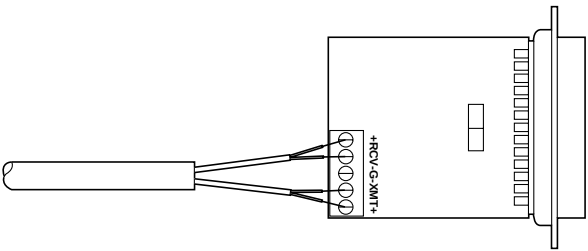


4. Connect one pair of wires to XMT+ and XMT- (transmit positive and negative) on the terminal block. Be sure to note which color is positive and which color is negative.
5. Connect the other pair of wires to RCV+ and RCV- (receive positive and negative) on the terminal block. Again, be sure to note which color is positive and which color is negative.

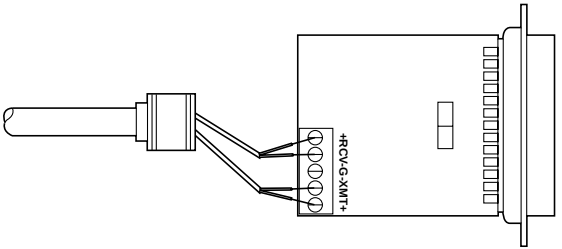
Ultimately, you will want to construct a two-pair crossover cable that connects the two short hauls as shown below:

XMT+	----------	RCV+	One Pair
XMT-	----------	RCV-	
G	--------- To Shield (Optional)	G	
RCV-	----------	XMT-	One Pair
RCV+	----------	XMT+	

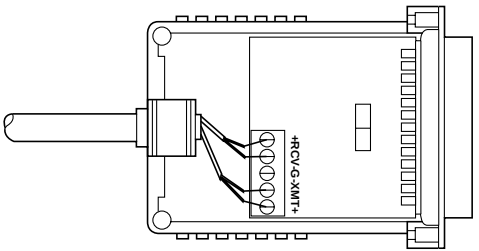
6. If there is a shield around the telephone cable, it may be connected to G on the terminal block. We recommend connecting the shield at the computer end only to avoid ground loops. A ground wire is not necessary for proper operation.
7. When you finish connecting the wires to the terminal block, the assembly should look something like this:



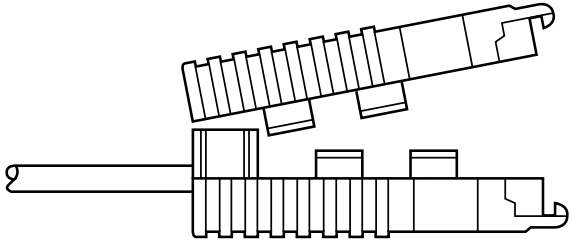
8. Place the two halves of the strain-relief assembly on either side of the telephone wire and press together lightly. Slide the assembly so that it is about two inches (5 cm) from the terminal posts and press together firmly.



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.



11. 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 finished.

4.3 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.

4.4 Operating the CS Mini Driver-A

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.

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