Mini Driver-15

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 B 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 classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

NORMAS OFICIALES MEXICANAS (NOM)
ELECTRICAL SAFETY STATEMENT

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.

2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.

3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.

8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.

9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

   A: El cable de poder o el contacto ha sido dañado; u

   B: Objectos han caído o líquido ha sido derramado dentro del aparato; o

   C: El aparato ha sido expuesto a la lluvia; o

   D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

   E: El aparato ha sido tirado o su cubierta ha sido dañada.

CONTENTS

TRADEMARKS USED IN THIS MANUAL

AT&T® is a registered trademark of American Telephone and Telegraph Company.

NCR® is a registered trademark of NCR Corporation.

Unisys® is a registered trademark of Unisys Corporation.

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1. Specifications

Protocol — Asynchronous

Speed — Up to 19.2 kbps (no strapping)

Distance —

	Wire Gauge		
Speed (bps)	19	24	26
19,200	2.5 mi (4.0 km)	1.8 mi (2.9 km)	1.2 mi (1.9 km)
9600	5.5 mi (8.9 km)	3.7 mi (6.0 km)	2.5 mi (4.0 km)
4800	7.5 mi (12.0 km)	5.0 mi (8.0 km)	3.0 mi (4.8 km)
2400	8.5 mi (13.7 km)	5.6 mi (9.0 km)	3.7 mi (6.0 km)
1200	9.0 mi (14.5 km)	6.2 mi (10.0 km)	4.3 mi (6.9 km)

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

Control Signals — DSR and DCD follow DTR from the terminal (DTE). CTS follows RTS from the terminal (DTE)

Operation — 4-wire unconditioned twisted-pair, full duplex

Transmit Level — -6 dBm

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

Power — No power required; uses ultra-low power (5 volts required) from EIA data and control signals: Pins 1, 2, 4, 10, and 12 in DCE mode (the Mini Driver does not operate in DTE mode)

Size — 2.5"H x 1.2"W x 0.75"D (6.4 x 3 x 1.9 cm)

Temperature — 32 to 140°F (0 to 60°C)

Humidity — 95% non-condensing

2. Description

The Mini Driver–15 lets you connect RS-232 devices equipped with DB15 connectors, including Unisys® (Sperry) 5000 and the NCR® "tower" series.

It features built-in transformers that eliminate noise and ground loops, so you can link devices between buildings.

At a range of 2.5 miles (4 km) on 19-AWG wire, the Driver operates full-duplex at speeds up to 19.2 kbps over two twisted-pair wires. Range can be extended up to nine miles (14.5 km) at 1200 bps.

An external DCE/DTE switch lets you connect any device without opening the Driver. Three enclosure options allow terminations via RJ-11, RJ-45, or terminal block. A strain-relief feature prevents thin twisted-pair wires from breaking or pulling loose.

The MSP model features custom-made transformers and transorbs for DC isolation and high-level surge protection. It features the latest in bidirectional clamping transient suppressors to protect itself and connected equipment from harmful transient discharges.

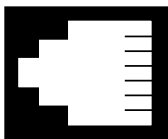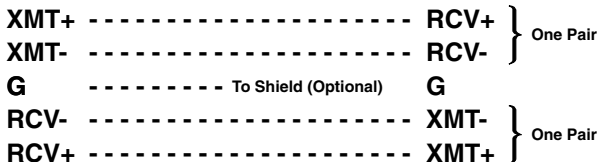**Note: The Line Driver 15 must be used in pairs.**

Features

- Eliminates ground loops caused by ground-potential differences in power systems.

- Features DC isolation between connected devices.

- Includes an external DCE/DTE switch.

- Housed in a small-size case ($^3/_4$-inch or 1.9-cm) for closely spaced computer ports.

- Uses modular plugs or terminal posts.

- Supports speeds up to 19.2 kbps.

- Uses surface-mount technology.
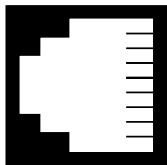
- Made in the U.S.A.

3. Installation

Note: These drivers work in pairs. You need one at each end of a 4-wire telephone cable.

Proceed as follows to install the Mini Driver–15 units:

1. If your Driver features RJ-11 or RJ-45 modular jacks, refer to **Section 3.1**. Be sure that the wiring between the Drivers makes the connections shown in paragraph 5. Now skip to paragraph 7.

2. If your Driver does not feature modular jacks, open the unit and connect one pair of wires in the telephone cable to XMT (Transmit) on the terminal block. Be careful to observe polarity. (The wire connected to XMT+ must be connected to RCV+ in the other unit. The wire connected to XMT- must be connected to RCV- in the other unit.)

3. Connect the other pair of wires in the telephone cable to RCV (Receive). Again, be careful to observe polarity.

4. If there is a shield around the telephone cable, it may be connected to G on the terminal block. We recommend that you connect the shield only at the computer end to avoid ground loops. A ground wire is not necessary for proper operation.

5. When you finish connecting the telephone line to units at both ends, it should look like this:

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

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

6. Insert the connector hardware on each side of the Driver. Snap the unit together. See **Section 3.2**.

7. Plug the Driver directly into a mating RS-232C connector on your terminal or computer. Tighten the two captive connector screws.

3.1 Using RJ-11 and RJ-45 Jacks

RJ-11 jacks on the Driver are prewired for a standard AT&T® wiring environment. To be sure you have the right wiring, use these tables as guides.

RJ-11	Signal	RJ-45	Signal
1	GND*	1	N/C
2	RCV-	2	GND
3	XMT+	3	RCV-
4	XMT-	4	XMT+
5	RCV+	5	XMT-
6	GND	6	RCV+
		7	BND
		8	N/C

Proper crossing of pairs between the two modems is as follows:

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.

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.

Gently open the unit by inserting a screw driver 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.
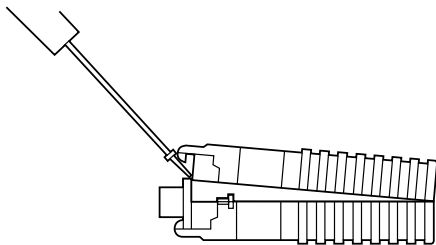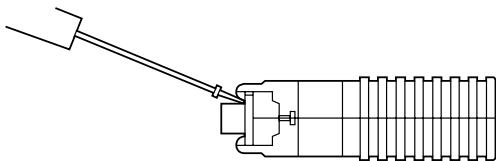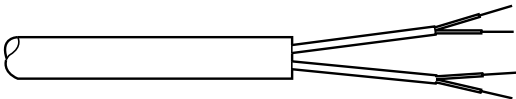

When the unit is open, you'll be able to see terminal blocks located at the rear of the PC board.

3.2 Installing the Strain-Relief Assembly

1. Strip the outer insulation from the twisted-pair
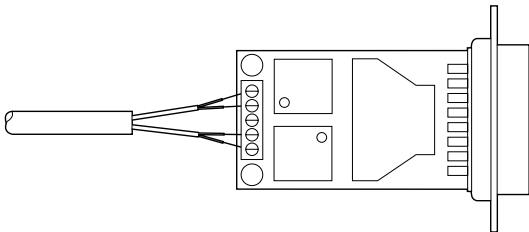   wires about one inch (2.5 cm) from the end.
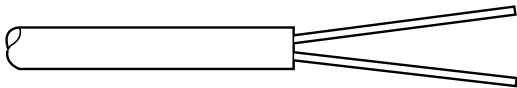
2. Strip back the insulation on each of the four
   twisted-pair wires about $1/4$ inch (0.6 cm).

3. Insert the proper terminal post and tighten the screw. Be sure to use one pair for transmit signals (XMT+ and XMT-) and the other pair for receive signals (RCV+ and RCV-).

**Note: Terminal-post locations may vary on different versions.**

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.
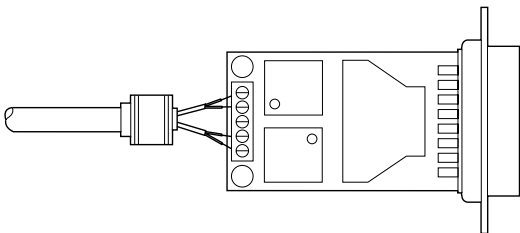
5. Insert the strain-relief assembly, with the wire going through it, into the slot in the bottom half of the modem case. Seat it into the recess in the case. If a telephone wire is too thin to be held by the strain-relief assembly, use tape to increase its diameter. If the wire is too large, it may be necessary to drill out the strain relief slightly.
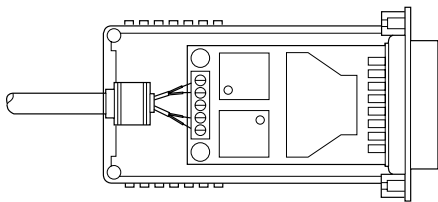
6. Bend the top half of the case and place it over the strain relief assembly. Do not snap the case together yet.
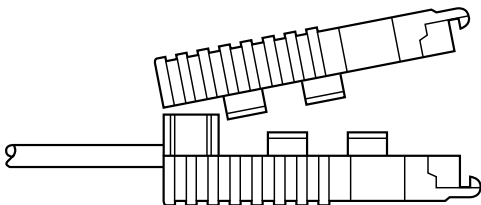
7. Insert one captive screw through a saddle washer. Insert the captive screw with the washer on it through the hole in the DB25 end of the case. Snap that side of the case closed. Repeat the process for the other side.
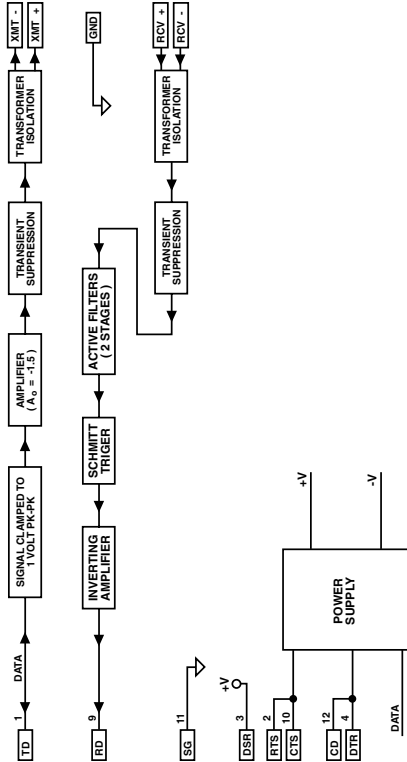
Appendix

Fig. A-1. This block diagram shows the internal functions of the Mini Driver–15.

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