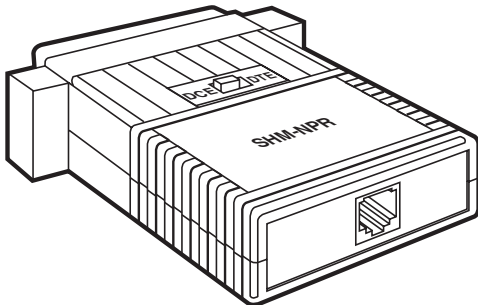


Short-Haul Modems, NPR/RJ-45



CUSTOMER SUPPORT INFORMATION

Order **toll-free** in the U.S.: Call **877-877-BBOX** (outside U.S. call **724-746-5500**)

FREE technical support 24 hours a day, 7 days a week: Call **724-746-5500** or fax **724-746-0746**

Mailing address: **Black Box Corporation**, 1000 Park Drive, Lawrence, PA 15055-1018

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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 classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par le ministère des Communications du 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 líneas 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 objetos 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: Objetos 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.

1. Specifications

Data Rates — 19,200 bps (according to the RS-232 interface)

Transmission Format — Asynchronous

Transmission Mode — Full duplex

Cable Type — 4-wire, unloaded, customer-owned twisted-pair cable with DC continuity

Connectors — RS-232: DB25 (male for ME822A-M, female for ME822A-F); Line: RJ-45 female

Operating Temperature — 32 to 112°F (0 to 45°C)

Humidity Tolerance — Up to 95% relative humidity

Power — From a terminal or computer. These signals must be available at the RS-232 connector:

- DCE configuration of the SHM when connected to a DTE: The + and - voltage is taken from pins 2, 4, 9, and 20

- DTE configuration of the SHM when connected to a DCE: The + and - voltage is taken from pin 3, 5, 6, 8, or 9.

NOTE

When power is removed from the DCE or DTE to which the SHM is connected, the SHM can no longer send a signal to the remote receiver. Under this condition, the idled cable is susceptible to noise reception. The remote receiver may output erroneous data bits as a result of noise.

Size — 2.2" x 1.8" x 0.8" (5.6 x 4.6 x 2 cm)

2. Description

The Short-Haul Modem NPR/RJ-45 uses the latest surface-mount technology to attain high-quality short-range modem performance in a low-profile package. The SHM operates at full duplex at data rates up to 19.2 Kbps over 2 twisted pair. Requiring no AC power or batteries, the SHM supports distances up to 17 miles (27.4 km).

With an externally accessible DCE/DTE switch, the SHM allows easy connection to any device without opening the unit. Termination is via RJ-45 connectors.

Table 2-1. Transmission Distances

Data Rate (bps)	Wire Gauge		
	19 AWG (0.9 mm)	24 AWG (0.5 mm)	26 AWG (0.4 mm)
19,200	6.2 (9.9)	3.7 (5.9)	1.2 (1.9)
9600	7.5 (12)	4.9 (7.8)	2.5 (4)
4800	8.7 (13.9)	5.6 (9)	3.7 (5.9)
2400	11.8 (18.9)	8 (12.8)	4.9 (7.8)
1200	17 (27.2)	11.8 (18.9)	8 (12.8)

These distances are for a noiseless environment with 20% or less of peak-to-peak gross distortion. Distances and rates listed are SHM to SHM.

The SHM has the option of being configured as either DCE or DTE devices. Set the switch located on the top of the printed circuit board to the DCE or DTE position.

NOTE

You don't have to open the plastic case to change the switch setting.

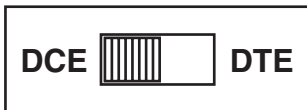


Figure 2-1. The DCE/DTE Switch.

The SHM meets the requirements for FCC Part 15 (RFI limits for Class A peripheral devices).

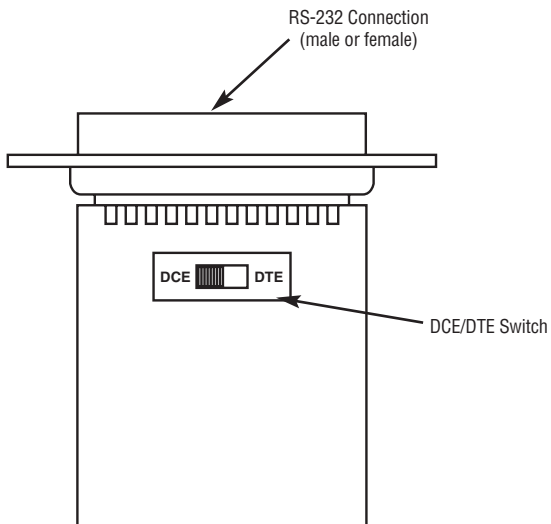


Figure 2-2. The SHM's Components.

3. Installation

The SHM plugs directly into the back of a terminal or computer. This eliminates the need for an RS-232C data cable. No power is required from an external source because the unit is powered entirely by the terminal or computer's control and data signals.

The SHM has an interface connection at each end, one for DTE or DCE, and one for the telephone line (twisted pairs). To install the SHM:

1. Connect the twisted-pair cable (customer-supplied) to the RJ-45 female. Refer to Figure 3-1 for the associated pin assignments.
2. When the SHM has been cabled, connect the telephone-interface cable to the telephone outlet.

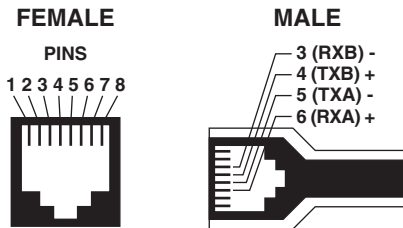


Figure 3-1. Pin Assignments for RJ-45 Connectors.

3. If the SHM is to be used as a DTE, set the externally accessible DCE/DTE switch to the DTE position. If the SHM is to be used as a DCE, set the switch to the DCE position. (If you are uncertain as to how your equipment operates, try each of the settings to see which one works in your application.)
4. Plug the SHM's interface connector end into the RS-232C connector on the DTE or DCE and tighten the connector mounting screws.

For examples of typical applications of the SHM with DTE or DCE devices, refer to Figure 3-3.

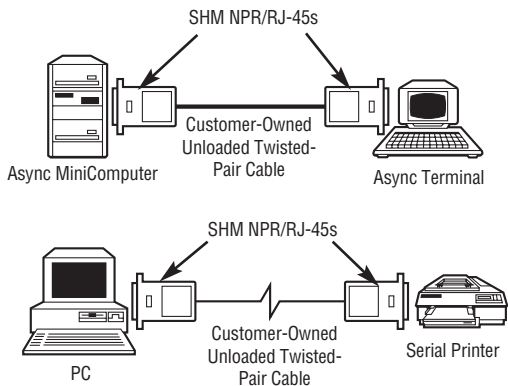


Figure 3-3. Typical Short-Range Modem Applications.

Appendix: RS-232 Signals

Pin	Circuit	Description	Signal Type	Direction
1	AA	Protective Ground	Ground	
2	BA	Transmitted Data	Data	To DCE
3	BB	Receive Data	Data	From DCE
4	CA	Request to Send	Control	To DCE
5	CB	Clear to Send	Control	From DCE
6	CC	Data Set Ready	Control	From DCE
7	AB	Signal Ground	Ground	
8	CF	Data Carrier Detect	Control	From DCE
9		DC Voltage		
20	CD	Data Terminal Ready	Control	To DCE

Pins 1 and 7 are tied together.

Pins 4 and 5 are tied together.

Pins 6, 8, and 20 are tied together.



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