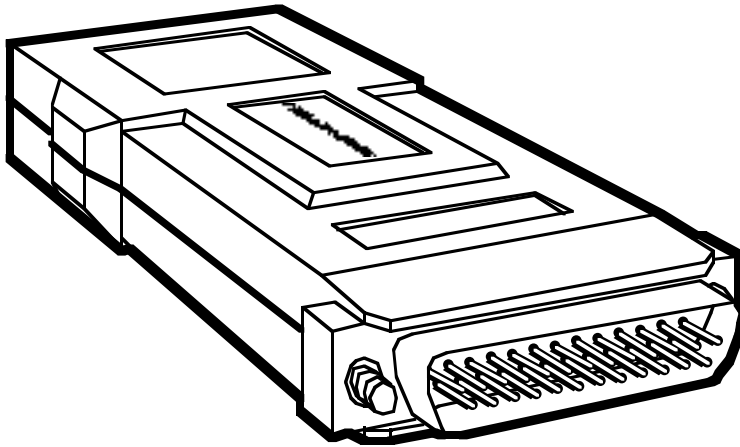# BLACK BOX®
NETWORK SERVICES

Short-Haul Modem—Nonpowered

Break the RS-232 distance limit—not your budget. Link terminals, printers, hosts—any async device—up to 3.2 miles (5.1 km) away at 9600 bps.

The SHM-NPR connects to your 4-wire twisted-pair cable via a 4-screw terminal block connector to boost in-house signals. The SHM-NPR/RJ functions in the same way, but uses an RJ-11 connector.

Key Features

▶ *Connect RS-232 devices more than 15 miles (24.1 km) apart.*

▶ *Eliminates the need for a an RS-232C data cable.*

▶ *Speeds up to 19.2 Kbps.*

▶ *Choose from 4-screw terminal block or RJ-11 models.*

▶ *Convenient slide switch selects DTE/DCE.*

▶ *Supports software flow control (X-ON/X-OFF).*

▶ *Available with male or female DB25 connectors.*

Overview

With the Short-Haul Modem—Nonpowered (SHR-NPR), you can make reliable, low-cost connections between async devices—well beyond the RS-232 distance limit.

The SHM-NPRs can strengthen and boost your data signals up to 3.2 miles (5.1 km) over in-house 4-wire twisted-pair cable at 9600 bps.

You have your choice of two low-cost models:
• SHM-NPR—This standard model has a DB25 connector for attaching directly to your RS-232 device, and a 4-screw terminal block for attaching to your twisted-pair cable.

• SHM-NPR/RJ—This convenient model is identical to the SHM-NPR, except that it has a built-in RJ-11 connector for fast connection to your modular cable.

Both models are DTE/DCE switch-selectable. And each supports software flow control. The SHM-NPR works at the highest speeds too—up to 19.2 Kbps (see the transmission-distance chart on **page 2** for detailed speed and distance specifications).
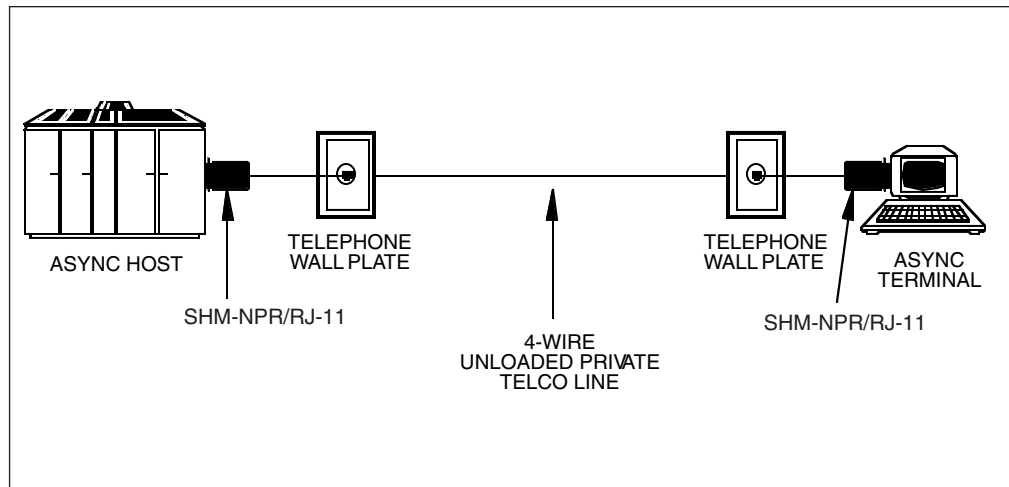
Since the SHM-NPR plugs directly into the back of a terminal or computer, you don't need to use an RS-232C data cable.

Typical Applications

• *Use SHM-NPR for in-house communications over twisted-pair cable.*

• *Use SHM-NPR/RJ for in-house communications over twisted-pair modular cable.*

Extend the distance between your Async Host and an Async Terminal up to 6 miles (9.7 km) using two SHM-NPRs and 4-wire unloaded private Telco cable.

ASYNC HOST

TELEPHONE WALL PLATE

SHM-NPR/RJ-11

4-WIRE UNLOADED PRIVATE TELCO LINE

TELEPHONE WALL PLATE

SHM-NPR/RJ-11

ASYNC TERMINAL

Technically Speaking

The SHM-NPR is designed to be used in a 4-wire, full-duplex, point-to-point configuration, with privately-owned 4-wire unloaded cable. (You supply this cable—it doesn't come with the unit. If you need cable, see the ordering information on the next page.) SHM-NPRs will not work, and could be damaged, if they are connected to regular telephone lines.

- The SHM-NPR has a male or female DB25 connector (specify gender when ordering) that plugs directly into the back of a terminal or computer, so you don't need an RS-232C data cable.

- On the other end of the SHM-NPR is either a 4-wire terminal block or an RJ-11 connector.

- There's also no need for an AC-power transformer, because the unit is powered entirely by the control and data signals from the attached terminal or computer.

The SHM-NPR derives power from your RS-232 interface as follows:

When configured as DCE:

- Takes negative voltage from either or both of Pins 2 and 10.

- Takes positive voltage from any or all of Pins 4, 9, and 20.

When configured as DTE:

- Takes negative voltage from either or both of Pins 3 and 10.

- Takes positive voltage from any or all of Pins 5, 6, and 9.

NOTE: The SHM-NPR might momentarily lose power if a BREAK from one of the attached RS-232 devices exceeds 300 ms and no voltages are present on the +VDC and -VDC pins. When the attached RS-232 device is OFF, the SHM-NPR can no longer send a signal to the remote receiver. Under this condition, the idled cable can receive noise and cause the remote receiver to output erroneous data bits.

- Two convenient user-control switches let you easily configure the unit.

A DCE/DTE switch configures your SHM-NPR as either DCE or DTE. (This switch configures the SHM-NPR itself, not the unit it is connected to.)

A USOC/MMJ switch configures the SHM-NPR to work with the specifications to which your device's twisted-pair cable is pinned.

The table at left shows expected transmission distances for 26, 24, 22, and 19 AWG cable.

NOTE: These distances are for unloaded cables in a noiseless environment with 20% or less of peak-to-peak gross distortion. Data rates listed are those most commonly used; the SHM-NPR is transparent to all data rates up to 19,200 bps. For any data rate that isn't listed, the maximum distance will be less than for the next-slowest listed rate and more than for the next-fastest listed rate.

Transmission Distances with 26, 24, 22, and 19 AWG Cable

DATA RATE (BPS)	WIRE SIZE 26 AWG (0.15 MM)	24 AWG (0.2 MM)	22 AWG (0.4 MM)	19 AWG (1.0 MM)
110	24.1 km	29 km	35.4 km	48.3 km
300	16.1 km	19.3 km	24.1 km	40.2 km
1200	9.7 km	12.1 km	14.5 km	24.1 km
2400	7.2 km	8.9 km	12.1 km	17.7 km
4800	5.6 km	7.2 km	8.9 km	11.3 km
9600	3.5 km	5.1 km	6.4 km	8 km
19,200	1.6 km	1.9 km	2.4 km	3.2 km

Specifications

Protocol — Asynchronous

Data Rate — Transparent to speeds up to 19.2 Kbps

Interface — Serial EIA RS-232C, CCITT V.24/V.28, DCE or DTE (user-selectable)

Operation — 4-wire, full-duplex, point-to-point

User Controls — ME721A: (1) side mounted slide switch for DTE/DCE selection; ME821A: (2) side-mounted slide switches: (1) for DTE/DCE selection, (1) for USOC/MMJ selection.

Connectors — ME721A-M: (1) DB25 male, (1) 4-wire screw terminal block; ME721A-F: (1) DB25 female, (1) 4-wire screw terminal block; ME821A-M: (1) DB25 male, (1) RJ-11 female; ME821A-F: (1) DB25 female, (1) RJ-11 female

Power — From RS-232 interface (+12 V DTR/DSR), 6.3 mA; When configured as DCE: Derives power from Pins 2, 4, 9, 10, and/or 20; When configured as DTE: Derives power from Pins 3, 5, 6, 9, and/or 10. (See the Technically Speaking section for more information about how the power is derived from these pins.)

Temperature — 0 to 45° C

Humidity — Up to 95%, noncondensing

Size — 2.2H x 5.3W x 9.7D cm

Weight — 57 g

The complete package
What you get when you order the SHM-NPR.

• SHM-NPR or SHM-NPR/RJ.

• User Manual.

Additional equipment you might need

• 4-wire unloaded twisted-pair cable.

Call our expert Technical Support Staff for all your needs. *They'll help you find the best equipment* for your application

Ordering Information

This information will help you place your order quickly.

PRODUCT NAME	ORDER CODE
Short-Haul Modem—Nonpowered (SHM-NPR)/4-Screw Terminal Block	
Male DB25 Connector	ME721A-M-R3
Female DB25 Connector	ME721A-F-R3
Short-Haul Modem—Nonpowered (SHM-NPR/RJ)	
Male DB25 Connector	ME821A-M-R4
Female DB25 Connector	ME821A-F-R4
NOTE: The above line drivers must be used in pairs.	
Category 3 Solid Bulk Cable (NEC®, CM, CMR, CMP), 2-Pair PVC	
500-ft. (152-m)	EYN712A-0500
1000-ft. (304-m)	EYN712A-1000
Custom lengths	EYN712A