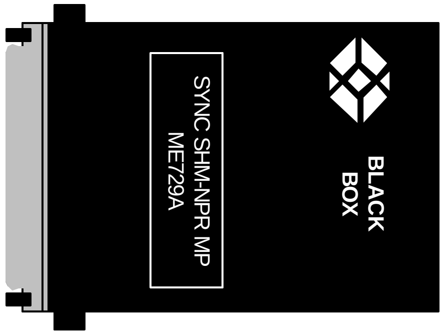

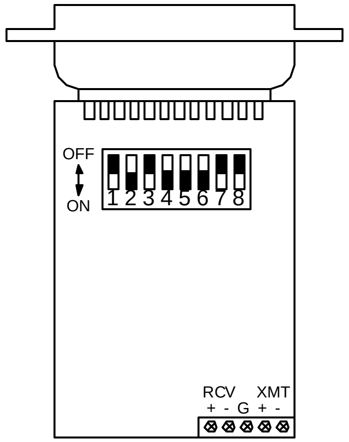

SPECIFICATIONS:

<u>Protocol:</u> Synchronous.

<u>Speed:</u> 1,200 to 19,200 bps.

<u>Range:</u> Up to 11 miles (17.7 km)

<u>Surge Protection:</u> 600 W power dissipation at 1 msec. and response time less than 1 picosecond.

<u>Control Signals:</u> RTS/CTS delay of 7 or 53 msec.; Carrier continuous or Controlled by RTS; DCD turns "ON" after recognizing the receive signal.

<u>Clocking:</u> Internal, External, or loopback derived from the receive signal.

<u>Operation</u>: 4-wire unconditioned twisted-pair, full- or half-duplex

<u>Connectors:</u> (1) DB25 male or female; (1) 5-screw terminal block.

<u>Transmit Level:</u> -6 dBm

<u>RTS/CTS Delay:</u> 7 or 53 msec.

<u>Power:</u> No power required; uses ultra-low power (at least 6 volts required) from EIA data and control signals: Pins 2,4,9 and 20.

ME729A-M/FSP with Surge Protection

DESCRIPTION:

The Sync SHM-NPR MP features surface-mount technology and a custom VLSI chip. It supports up to 12 drops and is powered by data only. It operates at speeds from 1,200 bps to 19,200 bps. The unit has the best speed-to-distance ration of any available data-powered sync SHM--11 miles (17.7 km) at low data rates and 4 miles (6.4 km) at 19,200 bps over two 22-AWG twisted-pair wires (conservatively rated).

The SHM-NPR operates at full- or half-duplex and uses three clocking methods: internal, external, and received loopback. It's also transformer-isolated for ground-loop protection. You can select RTS/CTS delay of 7 or 53 msec, and carrier status of constantly ON or RTS-controlled.

CONFIGURATION:

The Sync SHM-NPR MP has seven configuration switches, which allow selection of carrier control method, clocking method, RTS/CTS delay, and data rate. This section describes switch locations and explains all possible switch configurations.

For you convenience, all configuration switches are located on a SIP (single in-line package) mounted on the PC board. The figure to the left shows the location of the SIP on the board.

<u>SWITCH SETTINGS:</u>

All possible settings for the Sync SHM-NPR's configuration switches are presented in the table below.

Switch 1: Not Used

Switch 2: Carrier Enable: Use switch 2 to specify how the carrier signal is raised. In most point-to-point, full-duplex applications, the carrier signal can remain constantly "high". In a multi-point environment, contention for the line is controlled by RTS.

Switch 2	Setting:
ON	Constant Carrier (Default)
OFF	Controlled by RTS

Switches 3 and 4: Transmit Clock: Use Switches 3 and 4 together to specify the clocking method. The SHM-NPR can provide an internal clock (pin 15), receive an external clock (from pin 24), or loopback a receive clock.

Switch 3	Switch 4	Setting:
ON	ON	External Clock
ON	OFF	External Clock
OFF	ON	Internal Clock (Default)
OFF	OFF	Receive Loopback

Switch 5: RTS/CTS Delay: After the host terminal raises a request to send (RTS), the SHM-NPR raises CTS after a slight delay in order to give the remote terminal time to receive an incoming signal. Depending on the type of environment, either a 7- or 53-msec. delay can be selected.

Switch 5	Setting:
ON	7-msec. (Default)
OFF	53-msec.

Switches 6, 7, and 8: Data Rate: Switches 6 through 8 are set in combination to allow the SHM-NPR to support data rates from 1,200 to 19,200 bps. The data rate table below shows all the settings.

continued on next page

DATA RATE (bps)	Distance Table in miles (km)		
	WIRE GAUGE		
	19 AWG	24 AWG	26 AWG
19,200	7.5 mi (12.1 km)	3.5 mi (5.6 km)	2.5 mi (4 km)
9,600	10 mi (16.1 km)	3.5 mi (5.6 km)	2.5 mi (4 km)
4,800	10 mi (16.1 km)	7 mi (11.2 km)	4 mi (6.4 km)
2,400	10 mi (16.1 km)	8.5 mi (13.7 km)	5 mi (8 km)
1,200	11 mi (17.7 km)	8.5 mi (13.7 km)	6 mi (9.7 km)

DATA RATE: SWITCHES 6, 7, AND 8			
SETTING	SW-6	SW-7	SW-8
1,200 bps	ON	ON	ON
2,400 bps	ON	ON	OFF
4,800 bps	ON	OFF	ON
7,200 bps	OFF	ON	ON
9,600 bps	ON	OFF	OFF
14,400 bps	OFF	ON	OFF
19,200 bps	OFF	OFF	ON
19,200 bps	OFF	OFF	OFF

INSTALLATION:

Oned the Sync SHM-NPR is properly configured, it is ready to connect to your system. This section tells you how to properly connect the Sync SHM-NPR MP to the twisted-pair and RS-232 interfaces, and how to operate the unit.

Twisted-Pair Connection:

The Sync SHM-NPR supports data-only communication between two RS-232 devices at distances to 11 miles (17.7 km) and data rates to 19,200 bps. There are two essential requirements for installing the Sync SHM-NPR:

1. These units work in pairs. Therefore, you must have one unit at each end of a two twisted-pair interface.
2. To function properly, the Sync SHM-NPR 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.

Terminal-Block Twisted-Pair Connection:

If your application requires you to connect one or two pair of bare wires to the Driver, you'll need to get into the internal terminal blocks. In a two-pair circuit, 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.

Connect the other pair of wires to RCV+ and RCV- (receive positive and negative) on the terminal block. Again make careful note of which color is positive and which is negative. Your completed cross-over cable should be pinned electrically as follows:

XMT +	**RCV +**
XMT -	**RCV -**
RCV +	**XMT +**
RCV -	**XMT -**

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 to properly operate the Driver.