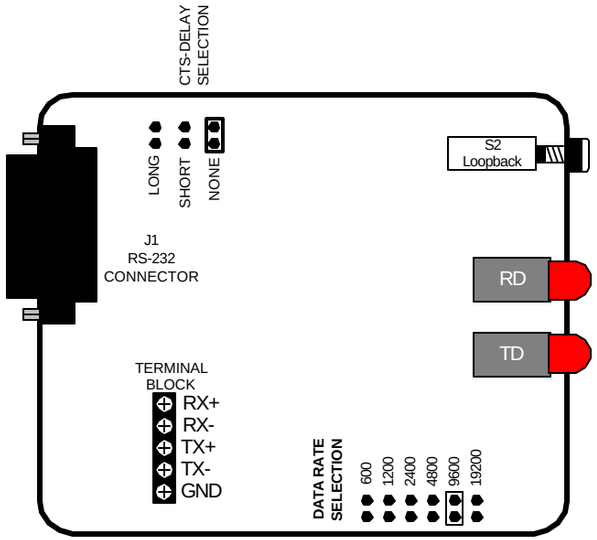

ME801A

SPECIFICATIONS:

Interface: RS-232-C (DCE) to attached local device; Proprietary balanced 4-wire to line.

Protocol: Synchronous

Clock Source: Local internal (each SHM-B Sync unit independently generates it's own clock.

Operation: 4-wire, Full Duplex, point-to-point.

Flow Control: Hardware (RTS and/or DTR), local only (control signals are not passed across the 4-wire line; transparent to software (X-ON/X-OFF).

Data Rate: 19,200, 9600, 4800, 2400, 1200, or 600 bps.

Loopback: Simultaneous local loopback to attached RS-232 device and remote loopback to remote SHM-B Sync (user-controllable)

User Controls: (1) Front-mounted push-button to turn loopback ON and OFF. (6) Internal pairs of jumper posts for setting the data rate. (3) Internal pairs of jumper posts for setting CTS delay.

Connectors: (1) DB25 Female connector; (1) 4-screw terminal block.

Indicators: (2); (1) TD and (1) RD.

Leads/Signals Supported: RS-232: TD, RD, RTS, CTS, DSR, SGND, DCD, TC, RC, DTR. Pins 1 thru 8, 15, 17, and 20.

Surge Protection: Internal opto-isolators (effective up to 20 VDC) on transmit and receive lines.

Power: Power is supplied by a wall-mounted power transformer.
Primary 115VAC +/- 10%, 60 Hz, 5 watts.
Secondary: 17 VAC, 700 ma
External Power Supply Part # = PS008

Data Rate in bps	Distance in miles	Distance in km
19,200	.75	1.2
9,600	.9	1.4
4,800	1	1.6
2,400	2	3.2
1,200	3.5	5.6
600	5	8

INTRODUCTION:

The Short-Haul Modem-B Sync (SHM-B Sync for short) is a synchronous full-duplex 4-wire line driver and receiver that makes it possible for two RS-232-C devices to communicate across distances up to 5 miles (8 km), at data rates up to 19,200 bps. In addition to its transmitter and receiver circuits, the SHM-B Sync also features status LED's a loopback switch, and support for RS-232 clock and control signals.

The SHM-B Sync is designed to operate with 4-wire cable. It is also designed for maximum operator safety. There are no voltages greater than 12 VDC or 17 VAC present on the unit's circuit board. Opto-isolation circuits protect both the transmit and receive lines against voltage surges (up to 20 VDC) such as those caused by lightning.

The SHM-B Sync is available in either a 120-VAC (ME801A) or 220-VAC (ME801A-E) standalone version or a card version (ME801-C) that will fit in our ME810 or RM007 card chassis.

CONFIGURATION:

Before you install a pair a SHM-B Sync units, you should set their configuration jumpers as necessary.

Caution!

If you have the card version, make very sure that the SHM-B Sync card is not installed in a powered chassis when you configure it. If you have the standalone version, make sure that it is unplugged and is disconnected from any other devices. No voltages greater than 17 VAC are ever present on the board even when it is powered, but the possibility of electric shock should always be avoided.

When you handle the SHM-B Sync's circuit board, take every reasonable precaution against damaging the board with static electricity. At the very least, discharge yourself by touching a fixed metal surface before handling the board; if possible, stand on an anti-static mat and wear a grounding strap or anti-static gloves.

There are two sets of jumper posts mounted on the SHM-B Sync's circuit board.

1. Six pairs of posts are used to set the SHM-B Sync's data rate. They're at the front of the left-hand side of the board. The six possible data-rate settings are 600, 1200, 2400, 4800, 9600, and 19200 bps. The factory-default value is 9600 bps; if your RS-232 equipment is using one of the other data rates, set the jumpers in both units accordingly by moving the jumper to the appropriate pair of posts. (The SHM-B Sync units must both be set to the same data rate, which they will generate internally; the attached devices must be set to accept clock from them).
2. Three pairs of posts are used to set the SHM-B Sync's CTS delay. They are at the rear of the right-hand side of the board. The CTS delay is the amount of time that the SHM-B Sync waits after detecting that the attached device has raised RTS before it responds by raising CTS. The possible settings are LONG (53 ms), SHORT (7 ms) or NONE. Factory default is NONE, but if your RS-232 device needs to see a CTS delay in order to function properly, move the jumper to the appropriate post in that SHM-B Sync only.

INSTALLATION:

1. Open the case of one of the SHM-B Sync units.
2. Thread the bare ends of the four wires into the four screw terminals on the SHM-B Sync's board marked RX+, RX-, TX+, and TX-. Refer to drawing on the next page for proper wiring of the terminal blocks.
3. Plug one end of an RS-232 cable into the DB25 female connector on the rear of the unit. Avoid running this cable farther than 50 ft.
4. Plug the other end of the RS-232 cable into a powered-down device whose serial communication you want to extend.
5. Repeat steps 1 thru 4 with the remote site's SHM-B Sync unit.

OPERATION:

While the SHM-B Sync and its attached devices are plugged in and turned on, the system should operate continuously without requiring human intervention. You can, however, monitor the unit's status at any time by looking at the LED's marked "TD" and "RD" on the unit's front panel. These will indicate the logic status of the transmitter and receiver circuitry, respectively: They will light green for a "high" logic level or red for a "low" logic level, and will flicker as data is transmitter and received. (These LED's respond to the actual transmitted and received signals, not the TD and RD lines of the RS-232 interface).

The RS-232 Signals, Flow Control, and Synchronous Timing:

The SHM-B Sync should be connected to your RS-232 device with a standard RS-232 cable. The cable must have a DB25 male connector at the SHM-B Sync's end. The type of connector at the other end will depend on what type of RS-232 device you're attaching, and the pinning of the cable will depend on whether the device is a DTE or DCE;

1. To connect a sync terminal, a PC running a sync protocol, or another DB25 male sync-DTE serial port, use a straight-through-pinned DB25 male-to-female RS-232 cable such as our product code ECN25C-MF.
2. To connect a mux's composite port or another DB25 female sync-DTE serial port, use a straight-through-pinned DB25 male-to-male RS-232 cable such as our product code ECN25C-MM.
3. To connect a sync modem, a mux's channel port, or another DB25 female sync-DCE serial port, use cross-pinned DB25 male-to male tail-circuit cable such as product code EYN255C.

To implement flow control as soon as the system begins operating, each SHM-B Sync unit forces its own RTS, CTS, DSR, and DTR signals "High" (above +3V), and as soon as each unit detects the presence of the one at the far end, it also raises CD in order to signal the attached device to expect data. If the cables are correctly wired and attached, the system is ready for continuous data transmission.

The control signals will stay in this state unless:

1. One of the SHM-B Sync units is powered down (all signal transmission at its end will cease and the other SHM-B Sync will lower CD).
2. The 4-wire cable is broken or detached (both SHM-B Sync units will lower CD).
3. An attached device is powered down or lowers DTR or RTS (its attached SHM-B Sync unit will drop carrier and the other will lower CD).

As far as the synchronous clock signals go, each SHM-B Sync will generate its own internal clock and continuously transmit it to the attached device on both the Transmit Clock (TC) and Receive Clock (RC) leads while the system is operating. ***The SHM-B Sync cannot accept clock from the attached device; it also cannot buffer signals, so it's very important that the two SHM-B Sync units are set to the same data rate.***

Note:
Always keep in mind that both clocking and flow control operate locally only--the data signals are the only signals passed across the 4-wire line.