BLACK BOX

LOOP   LENGTH   TD/DTR   RD/DCD   LOOPBACK

DTR
LO HI

DTR SLIDE SWITCH

HI
LO

LOOPBACK

RD/DCD

TD/DTR

RS-232 CONNECTOR

TERMINAL BLOCK
+
I

POWER CORD

LOOP

LENGTH

+
—

+
—

ME755A

SPECIFICATIONS:

Interface: RS-232

Line Interface: Balanced 2-wire current loop

Loopback: Digital loopback on RS-232 interface provided by front-panel switch

Idle Status (DTR) Control: DTR may be pulled either high(true) or low(false) using a front panel switch. When active RS-232 equipment is attached, the status of the DTR signal is controlled by the equipment.

Status Indication: (2) bi-color LED's indicate the status of the transmitter and receiver. Green - indicates a "low" logic level (-3 to -25V) on the RS-232 interface. Red - indicates a "high" logic level (+3 TO +25v). Off - indicates the associated control is "low". The control signal that controls the transmitter is DTR. The control signal that shows the status of the receiver is DCD

Power: 120VAC +/- 10%, 60 Hz

Loop-Length Settings for 24 or 26 AWG:

RED SWITCH:	ORANGE SWITCH:
0	0
1	0
2	1
3	2
4	3
5	4
6	5
7	6
8	7
9	8
A	9
B	A
C	B
D	C
E	D

Note: DO NOT use the "F" position on the Red Loop Length switch.

DESCRIPTION:

The 2-wire Short Haul Modem (SHM-2) is an asychronous, full-duplex line driver and receiver which requires only two wires to transmit data. A pair of SHM2's enables two RS-232 devices to communicate at distances of up to two miles and at bit rates of up to 19,200 bps, while fully supporting hardware handshaking. The SHM2 is designed to operate over a two-wire metallic circuit. Optimum performance is obtained with 22 to 26 AWG twisted-pair telephone cable. However, nearly any twisted-pair calbe can be used, with little or no performance degradation.

In addition to the transmitter and receiver circuits, the modem includes RS-232 control-line interfaces, status monitor LED's and a loopback switch.

The SHM2 is available in a standalone version and a rackmount version. Both versions are identical, except the standalone version is packaged in a plastic case, from which it can be removed and installled in a chassis, if desired.

INSTALLATION:

Before installing your modem, be certain that it is not plugged into the power source, and the the RS-232 equipment is turned-off.

Step One: Connecting the Two-Wire Cable

Installation of the SHM2 requires that the positive (+) terminal on the SHM2 is connected to the positive (+) terminal of the other SHM2, and that the negative (-) terminal is wired directly to the negative (-) terminal.

Step Two: Test the Cabling

Apply power to both of the modems. The front panel switches should be in the following position:
Loopback Switch: Normal position (center of button is black);
DTR Switch: HI position
Loop-Length Switches: Rotary switches set to 0 (zero)

Oberserve the two LED's on the front panel of both of the modems. They should be Green. If the RD/DCD indicator is RED on both modems, the wire polarity is reversed. Correct the wiring and re-test. If either or both indicators are OFF, check to make sure that power is applied and that your cable connections are making good contact. When both LED's on each SHM2 are Green, you are ready to set the loop-length switches.

Step Three: Set the Loop-Length Switches

In order for the SHM2 to function properly, it is necessary to adjust these rotary switches for each installation. The setting procedure should be necessary only once, when you install the units. To establish the proper settings, both of the SHM2 should have power applied, but should not be connected to any RS-232 equipment. By following the above test procedure, the cable connections have been verified and both LED indicators should be GREEN.
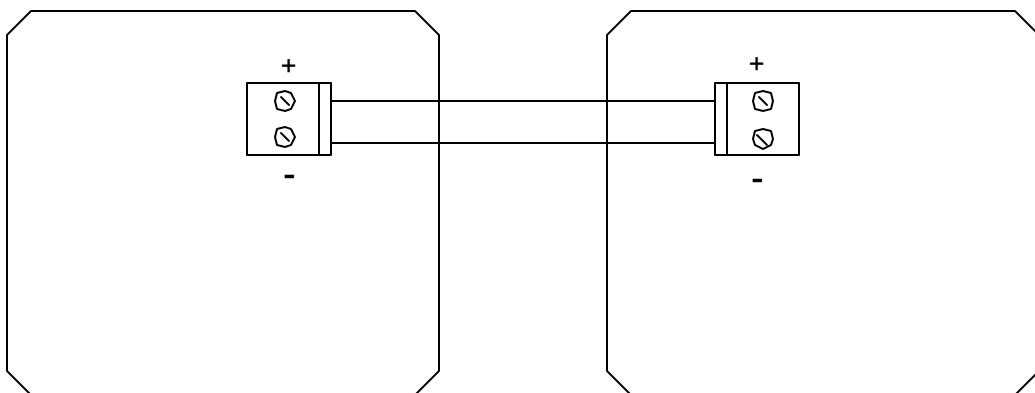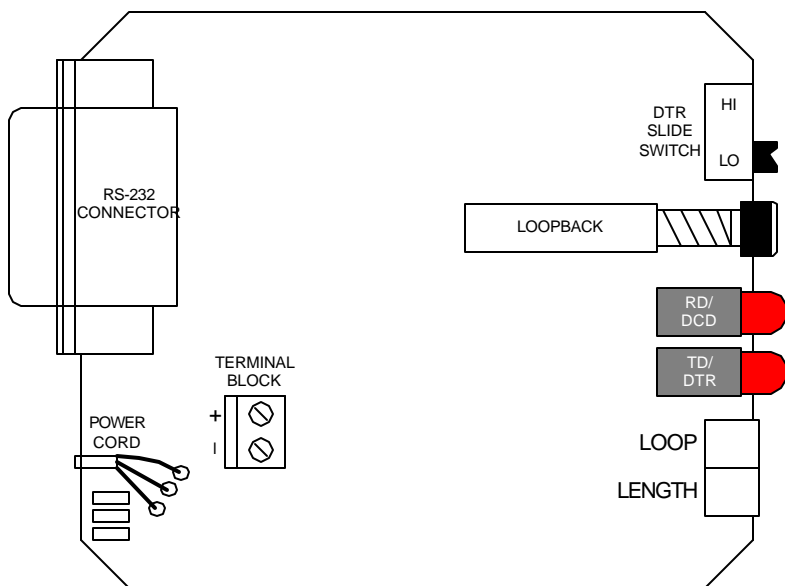
Begin with both Loop Length switches set to 0. Turn the DTR switch to LO on the near end SHM2 unit. The TD/DTR indicator should go off. Go to the far end SHM2 and observe the status of the RD/DCD indicator, making sure that the DTR switch at that end is in the HI position. If the distance between the modems is extremely short (less than 100 feet), the RD/DCD indicator should be off. If so, no adjustments are necessary. Normally it will be on, and an adjustment will be necessary. Begin by turning the left rotary switch (red actuator) one position at a time using a screwdriver. Keep advancing one position at a time until the RD/DCD indicator goes off. This is now the correct position for the red switch.

Repeat this procedure for the near end SHM2 (the one you just calibrated). Go back to the near end SHM2 and place the DTR switch in the HI position and follow the above procedure to get the RD/DCD indicator to turn OFF The settings obtained for both ends should be the same.

The final step is to set the DTR switches at both ends to the HI position.

Flow Control:

The SHM2 uses the Data Terminal Ready (DTR) control signal to turn the transmitter off and on. Normally the attached RS-232 equipment will control the state of DTR. If attached RS-232 equipment is disconnected or turned off, the DTR switch on the front panel of the SHM2 controls the state of DTR.