

RS-232/RS-485 CONVERTER

USERS MANUAL
REVISION 2

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ASSY. DRAWING RS-232/RS-485 CONVERTER
SCHEMATIC RS-232/RS-485 CONVERTER

GENERAL INFORMATION

1.1 INTRODUCTION

This Users Manual provides the information necessary for installation, maintenance and operation of the MARC RS-232 to RS-485 converter module. This module is identified as Part Number MP122-002.

1.2 GENERAL DESCRIPTION

The MARC MP122-002 converter provides a convenient method of interfacing RS-232 based equipment with an RS-485 network using a half duplex, single twisted pair transmission line. Up to thirty two (32) RS-485 users can be connected together at rates up to 9600 baud and separations of up to 6000 feet. The MP122-002 is a small (3.85" X 3.00") printed circuit module designed for panel mounting. The board includes a power supply, an RS-485 Transceiver, RS-232 Driver/Receivers, a Single Character Buffer and Terminal Strips for wiring termination. Only Transmit, Receive and Ground signal lines are used on the RS-232 side of the converter to allow its use in many different applications. Data Terminal Ready (DTR), Request to Send (RTS), Carrier Detect (CD) and Clear to Send (CTS) interface signals are not required for operation of the converter. Operation in an RS-485 environment requires that all devices have some level of intelligence in order to establish an orderly flow of data on the single twisted pair. The MP122-002 can be used to connect devices with RS-232 interfaces into almost any type of RS-485 network as long as the devices have the requisite level of intelligence. The RS-485 transceiver is normally in the 'receive' mode. Any data on the RS-485 bus is converted to RS-232 voltage levels and immediately transmitted out the RS-232 side of the converter to the RS-232 device. When the RS-232 device determines that it can transmit data onto the bus it sends a character to the converter board. The converter board buffers the incoming serial data until a complete character has been received. After a complete character has been received the converter board will switch its RS-485 transceiver to the 'transmit' mode and send the character onto the RS-485 bus. The converter can receive the next character from the RS-232 device at the same time that it is sending the first character onto the RS-485 bus.

INSTALLATION AND OPERATION

2.1 INTRODUCTION

This section details the information necessary for set-up and operation of the RS-232/RS-485 converter.

2.2 SERIAL INTERFACE OPTION SELECTION

Since the converter board must temporarily buffer an incoming character from the RS-232 side the board must have its serial interface receiver set up to match the transmitted serial data. The set-up parameters include the baud rate, number of data bits, number of stop bits and parity. Switch S1, a nine position DIP switch is used to select the serial interface parameters as detailed in the following sections.

2.2.1 BAUD RATE SELECTION

The baud rate is selected using switch positions 5 thru 8 on switch S1. The switch should be set as shown in Table 2.1 below.

SWITCH	BAUD RATE
8 7 6 5	
0 0 0 0	110
0 0 0 1	150
0 0 1 0	300
0 0 1 1	2400
0 1 0 0	1200
0 1 0 1	1800
0 1 1 0	4800
0 1 1 1	9600
1 0 0 0	2400
1 0 0 1	600
1 0 1 0	200
1 0 1 1	134.5
1 1 0 0	75
1 1 0 1	50
1 1 1 0	Invalid
1 1 1 1	Invalid

Note: A '1' in the table above indicates a switch in the ON position. A '0' indicates a switch in the OFF position

Table 2.1 BAUD RATE SELECTION

2.2.2 NUMBER OF DATA BITS SELECTION

The number of data bits to be transmitted or received is selected using positions 3 and 4 of switch 1.

SWITCH	NUMBER OF DATA BITS
3 4	
0 0	8 Data Bits
0 1	7 Data Bits
1 0	6 Data Bits
1 1	5 Data Bits

Note: A '1' in the table above indicates a switch in the ON position. A '0' indicates a switch in the OFF position

Table 2.2 NUMBER OF DATA BITS SELECTION

2.2.3 STOP BIT SELECTION

The number of stop bits expected on receive data and the number to be transmitted is selected using position 2 of switch S1. If the switch is ON or CLOSED the number of stop bits will be set to one (1). If position 2 is OFF or OPEN then the number of stop bits will be set to two (2) except when the number of data bits is selected to be 5. If the number of data bits selection is 5 then setting position 2 OFF will set the number of stop bits to 1.5 instead of 2.

2.2.4 PARITY SELECTION

A parity bit can be optionally received or transmitted following the last data bit. The parity selection can be set to be either even, odd or none. Switch positions 1 and 9 of switch S1 are used to select the desired parity options. Table 2.3 defines the possible selections.

SWITCH	PARITY SELECTION
9 1	
0 0	Disabled
0 1	Disabled
1 0	Even Parity
1 1	Odd Parity

Note: A '1' in the table above indicates a switch in the ON position. A '0' indicates a switch in the OFF position

Table 2.3 PARITY SELECTION

2.3 SERIAL INTERFACE CONNECTIONS

A terminal strip is used for connection of the serial interface wiring. The terminal strip is clearly marked to identify the connections. Table 2.4 details the serial interface connections.

TERMINAL	FUNCTION
T	Transmitted Data (from RS-485 to RS-232)
R	Received Data (from RS-232 to RS-485)
GND	Ground Reference
GND	Ground Reference
A	RS-485 (normally low)
B*	RS-485 (normally high)

Table 2.4 SERIAL INTERFACE CONNECTIONS

2.4 POWER CONNECTION

The RS-232/RS-485 Converter can be powered from a low voltage DC or AC source. The power supply leads should be terminated on the input terminal strips marked 'H' and 'N'. There are two positions marked 'H' and two positions marked 'N'. They are connected in parallel on the board so either connection can be used. The second set can be used to chain power to other devices if required. The converter will accept input voltages from 9 to 17 volts, peak, either AC or DC. The polarity of the applied voltage is immaterial. If an AC source is used it should be transformer coupled to isolate it from the AC power lines. Note that the input voltage range is given as volts peak not RMS. The maximum AC input RMS voltage is 12.0 volts.

2.5 PANEL MOUNTING LOCATIONS

The converter board is designed for panel mounting. An integral standoff is located in each corner of the board. The standoff is 1/4 inch long and has a clearance hole for a number six screw (.140"). The standoffs are located .200" in from each corner of the board. Figure 2.1 shows the locations of the panel mounting holes.

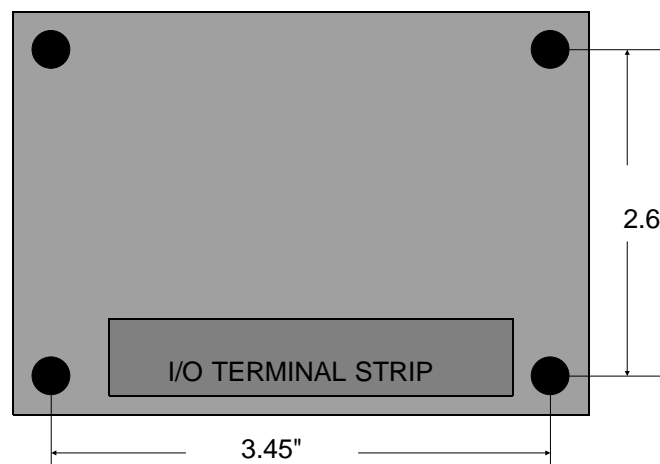


Figure 2.1 MOUNTING PANEL HOLE LOCATION

SPECIFICATIONS

3.1 INTRODUCTION

This section lists the electrical, mechanical and environmental specifications for the RS-232/RS-485 Converter.

3.2 RS-232/RS-485 CONVERTER SPECIFICATIONS

- **Mechanical:**
 - Size: 3.00" W x 3.85" L x 1.25" H
 - Panel Mounted
 - Weight: 3 oz.
- **Interface:**
 - RS-232 Conforms to EIA RS-232 specifications

Signals Supported	Terminal Strip
TD Transmit Data	T
RD Receive Data	R
GND	Ground

 - RS-485 Conforms to EIA RS-485 specification
- **Power:**
 - 9 to 17 Volts DC, 70 ma. max.
 - 6.3 to 12 Volts AC (RMS), 70 ma. max.
- **Connections:**
 - 10-position Clamp Screw Terminal Strip
- **Switch Options:**
 - 50 to 9600 Baud
 - 5 to 8 Data Bits
 - 1 or 2 Stop Bits
 - Even, Odd or No Parity
- **Environmental:**
 - Operating Temperature 0 to 70 Deg. C.
 - Storage Temperature -25 to 85 Deg. C.
 - Humidity 10 to 90% RH, Non Condensing