USER MANUAL

MODEL 2084

High Speed RS-232 to RS-485 Interface Converter

PATTON Electronics Co.

Part# 07M2084-B
Doc# 047061UB
Revised 01/26/99

An ISO-9001 Certified Company

SALES OFFICE
(301) 975-1000
TECHNICAL SUPPORT
(301) 975-1007
http://www.patton.com

1.0 WARRANTY INFORMATION

Patton Electronics warrants all Model 2084 components to be free from defects, and will—at our option—repair or replace the product should it fail within one year from the first date of shipment.

This warranty is limited to defects in workmanship or materials, and does not cover customer damage, abuse or unauthorized modification. If this product fails or does not perform as warranted, your sole recourse shall be repair or replacement as described above. Under no condition shall **Patton Electronics** be liable for any damages incurred by the use of this product. These damages include, but are not limited to, the following: lost profits, lost savings and incidental or consequential damages arising from the use of or inability to use this product. **Patton Electronics** specifically disclaims all other warranties, expressed or implied, and the installation or use of this product shall be deemed an acceptance of these terms by the user.

1.1 RADIO AND TV INTERFERENCE

The Model 2084 generates and uses radio frequency energy, and if not installed and used properly—that is, in strict accordance with the manufacturer's instructions—may cause interference to radio and television reception. The Model 2084 has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection from such interference in a commercial installation. However, there is no guarantee that interference will not occur in a particular installation. If the Model 2084 does cause interference to radio or television reception, which can be determined by disconnecting the RS-232 interface, the user is encouraged to try to correct the interference by one or more of the following measures: moving the computing equipment away from the receiver, re-orienting the receiving antenna and/or plugging the receiving equipment into a different AC outlet (such that the computing equipment and receiver are on different branches).

1.2 CE NOTICE

The CE symbol on your Patton Electronics equipment indicates that it is in compliance with the Electromagnetic Compatibility (EMC) directive and the Low Voltage Directive (LVD) of the Union European (EU). A Certificate of Compliance is available by contacting Technical Support.

1.3 SERVICE

All warranty and non-warranty repairs must be returned freight prepaid and insured to Patton Electronics. All returns must have a Return Materials Authorization number on the outside of the shipping container. This number may be obtained from Patton Electronics Technical Service: **(301) 975-1007, http://www.patton.com**; **support@patton.com**. *Packages received without an RMA number will not be accepted.*

Patton Electronics' technical staff is also available to answer any questions that might arise concerning the installation or use of your Model 2084. Technical Service hours: **8AM to 5PM EST, Monday through Friday.**

2.0 GENERAL INFORMATION

Thank you for your purchase of this Patton Electronics product. This product has been thoroughly inspected and tested and is warranted for One Year parts and labor. If any questions or problems arise during installation or use of this product, please do not hesitate to contact Patton Electronics Technical Support at (301) 975-1007.

2.1 FEATURES

- Operates asynchronously, point to point over 2 wires
- Data rates to 115.2 Kbps
- Passes transmit & receive data
- No AC power or batteries are required
- Able to operate without “echo”
- Compact size (2.66” x 2.10” x 0.73”)
- Twisted pair connection via strain relief, RJ-11 or RJ-45
- Silicon Avalanche Diode surge protection

2.2 DESCRIPTION

The Model 2084 High Speed RS-232 to RS-485 Interface Converter provides exceptional versatility in a compact package. Requiring no AC power or batteries for operation, the Model 2084 supports asynchronous RS-485 data rates to 115.2 Kbps over one unconditioned twisted pair.

The Model 2084 is equipped with a DB-25 for the RS-232 connection. Options for twisted pair connection include terminal blocks with strain relief, RJ-11 or RJ-45. Silicon Avalanche Diodes provide 600 watts per wire of protection against harmful data line transient surges.

3.0 CONFIGURATION

The Model 2084 does not require configuration. Model 2084 is factory configured as Data Circuit Terminating Equipment (DCE). That is, it “wants” to connect to Data Terminal Equipment (DTE) via its DB-25 RS-232 port. Figure 1 (below) shows the RS-232 DB-25 connector and terminal blocks on the printed circuit board.

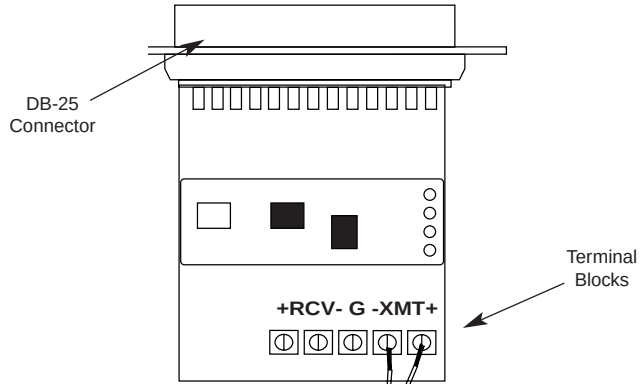


Figure 1. Top view of Model 2084 board

4.0 INSTALLATION

This section tells you how to properly connect the Model 2084 to the RS-232 and RS-485 interfaces, and how to operate the Model 2084.

4.1 CONNECTING THE RS-485 INTERFACE

The RS-485 interface is factory configured as Data Circuit Terminating Equipment (DCE). Therefore, it “wants” to connect directly to Data Terminal Equipment (DTE) such as a terminal or PC. If you must use a cable to connect to the DTE, use a *straight-through* cable no longer than 50 feet.

4.2 CONNECTION TO THE RS-485 INTERFACE

To function properly, the Model 2084 *must* have one twisted pairs of metallic wire. This pair must be "dry" (unconditioned) metallic wire, between 19 and 26 AWG (the higher number gauges may limit distance somewhat).

For your convenience, the Model 2084 is available with several different physical interfaces on the RS-485 side: RJ-11 jack, RJ-45 jack, and terminal blocks with strain relief.

4.2.1 Connecting via the RJ-11 Connector

The RJ-11 version of Model 2084 uses an RJ-11 connector on the RS-485 side. The RJ--11 connector is prewired for a standard TELCO wiring environment. The signal/pin relationships are shown below in Figure 2.

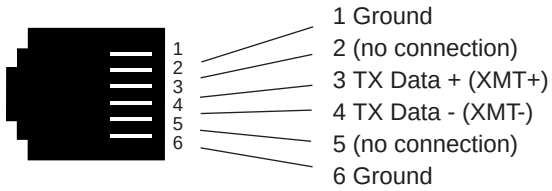


Figure 2. RJ-11 Twisted Pair Pin/Signal Relationships

When connecting the *twisted pair* cable from the 2084’s RJ-11 jack to the RS-485 device, your cable must be connected in the manner shown below.

MODEL 2084		RS-485 DEVICE
SIGNAL	**PIN#**	**RS-485 SIGNAL**
GND*	1	
n/c	2	
XMT+	3	XMT A
XMT-	4	XMT B-
n/c	5	
GND*	6	

*Connection to ground is optional

4.2.2 Connecting via the RJ-45 Connector

The RJ-45 version of Model 2084 uses an RJ-45 connector on the RS-485 side. The RJ-45 connector is prewired for a standard TELCO wiring environment. The signal/pin relationships are shown below in Figure 3.

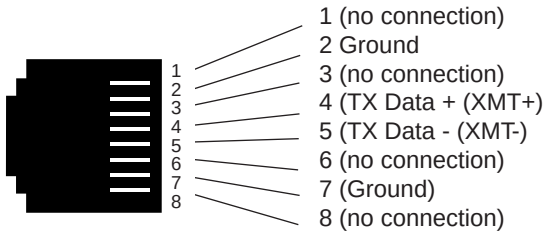


Figure 3. RJ-45 Twisted Pair Line Interface

When connecting the *twisted pair* cable from the 2084's RJ-45 jack to the RS-485 device, your cable must be connected in the manner shown below.

MODEL 2084		RS-485 DEVICE
SIGNAL	**PIN#**	**RS-485 SIGNAL**
N/C	1	
GND*	2	
N/C	3	
XMT+	4	XMT A
XMT-	5	XMT B-
N/C	5	
GND*	7	
N/C	8	

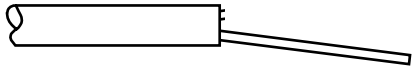
*Connection to ground is optional

4.2.3 4-WIRE CONNECTION USING TERMINAL BLOCKS

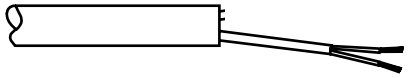
If your RS-485 application requires you to connect one pair of bare wires to the Model 2084, you will need to open the case to access the terminal blocks. The following instructions will tell you how to open the case, connect the bare wires to the terminal blocks, and fasten the strain relief collar in place so that the wires won't pull loose.

1. If the case is not already open, open it now by twisting it open with a small plastic screwdriver.

2. Strip the outer insulation from the twisted pairs about one inch from the end.



3. Strip back the insulation on each of the 2 twisted pair wires about .25".



4. 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.

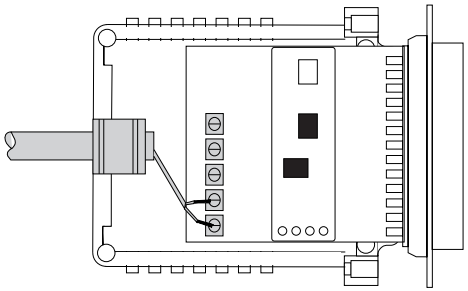
5. Connect the same *pair* of wires to XMT A and XMT B on the RS-485 Device, respectively.

Ultimately, you will want to construct a two pair cross over cable that makes a connection with the RS-485 device as shown below:

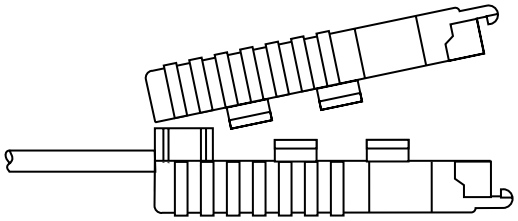
Model 2084	**RS-485 Device**
XMT+	XMT A
XMT-	XMT B

6. Place the 2 halves of the strain relief assembly on either side of the telephone wire and press together very lightly. Slide the assembly so that it is about 2 inches from the terminal posts and press together firmly. If your cable diameter is too small or too large for our strain relief, please contact our technical support. We have strain relief assemblies to accommodate most cable diameters.

7. Insert the strain relief assembly with the wire going through it into the slot in the bottom half of the modem case and set it into the recess in the case.



8. BEND the top half of the case as necessary to place it over the strain relief assembly. Do not snap the case together yet.



9. Insert one captive screw through a saddle washer and then insert the captive screw with the washer on it, through the hole in the DB-25 end of the case. Snap that side of the case closed. Repeat the process for the other side. This completes the cable installation process.

4.3 OPERATING THE MODEL 2084

Once the Model 2084 is properly installed, it should operate transparently—as if it were a standard cable connection. Operating power is derived from the RS-232 data and control signals; there is no "ON/OFF" switch. All data signals from the RS-232 and RS-485 interfaces are passed straight through.

APPENDIX A

PATTON ELECTRONICS MODEL 2084 SPECIFICATIONS

Transmission Format:	Asynchronous
Data Rate:	Up to 115,200 bps
Range:	Up to 4000 feet @ 9600 bps
RS-232 Interface:	DB-25
RS-485 Interface Options:	RJ-11 or RJ-45 jack; terminal block with strain relief
Transmit Line:	2 wire unconditioned twisted pair
Transmit Mode:	2-wire half duplex
Surge Protection:	600W power dissipation at 1 mS
Power:	Draws operating power from RS-232 data and control signals; no power or batteries required.
AC	
Temperature:	0 to 50º C
Humidity:	5 to 95%, non-condensing
Size:	2.66” x 2.10” x 0.73”

APPENDIX B

PATTON ELCTRONICS MODEL 2084 RS-232 PIN CONFIGURATIONS

DIRECTION	“DCE” ORIENTATION	DIRECTION
To Model 2084	Data Term. Ready (DTR) - 20	1- (FG) Frame Ground 2- (TD) Transmit Data — To Model 2084 3- (RD) Receive Data — From Model 2084 4- (RTS) Request to Send — To Model 2084 5- (CTS) Clear to Send — From Model 2084 6- (DSR) Data Set Ready — From Model 2084 7- (SG) Signal Ground 8- (DCD) Data Carrier Detect — From Model 2084