

USER MANUAL

**MODEL 1002
and 1002S**
*Asynchronous
2-Wire / Coax
Short Range Modem*



*An ISO-9001
Certified Company*

Part #07M1002-C
Doc. #050011UC
Revised 4/28/98

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

1.0 WARRANTY INFORMATION

Patton Electronics warrants all Model 1002 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 1002 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 1002 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 1002 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 Patton Technical Support.

1.3 SERVICE

All warranty and nonwarranty 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 at

telephone: (301) 975-1007,
web address: <http://www.patton.com>;
email: support@patton.com.

NOTE: 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 1002. 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

- Full duplex operation on coax or a single twisted pair
- Data rates to 19,200 bps
- Range to 2 miles (3.2 km)
- No AC power or batteries required
- Twisted pair connection via strain relief, RJ-11 or RJ-45
- Surge protected (Model 1000S only)
- Coax connection via female BNC (optional)
- External DCE/DTE switch
- Made in the USA

2.2 DESCRIPTION

The Model 1002 Asynchronous Short Range Modem extends RS-232 distances to 2 miles (3.2 km) over coax or a single unconditioned twisted pair. The small size of this unit enables use where serial ports are very close together or are not easily accessible. The Model 1002 incorporates innovative circuitry that lets it operate without connection to AC power or batteries. The necessary power for operation is derived from the RS-232 input signals.

An external DCE/DTE switch allows easy connection of the Model 1002 to any device without opening the unit to re-configure. Three enclosure options allow termination of a single twisted pair via RJ-11, RJ-45 or terminal blocks. A unique strain relief prevents the twisted pair from breaking or pulling loose. An additional enclosure option allows termination of coax cable via female BNC.

The Model 1002S is a surge protected version of the Model 1002 that uses the latest in bi-directional, clamping, transient suppressors to protect itself and connected equipment against harmful transient discharges. For surge handling capability, the Model 1002S is compliant with IEC 801.5 level 2, 1kV.

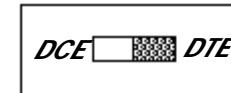
3.0 INSTALLATION

The Patton Model 1002 is easy to install and should give you years of trouble-free service. You must have a PAIR of units to perform an installation—one at each end of an unconditioned twisted pair or coax cable. The following instructions explain this procedure.

3.1 SETTING THE DTE/DCE SWITCH

For your convenience, the Model 1002 has an externally accessible DCE/DTE switch (see diagram below). If the device connected to the Model 1002 is a modem or multiplexer (or is wired like one), set the DCE/DTE switch to "DTE". This means the Model 1002 will behave like Data Terminal Equipment and transmit data on pin 2.

If the device connected to the Model 1002 is a PC, terminal or host computer (or is wired like one), set the DCE/DTE switch to "DCE". This setting means the Model 1002 will behave like Data Communications Equipment and transmit data on pin 3.



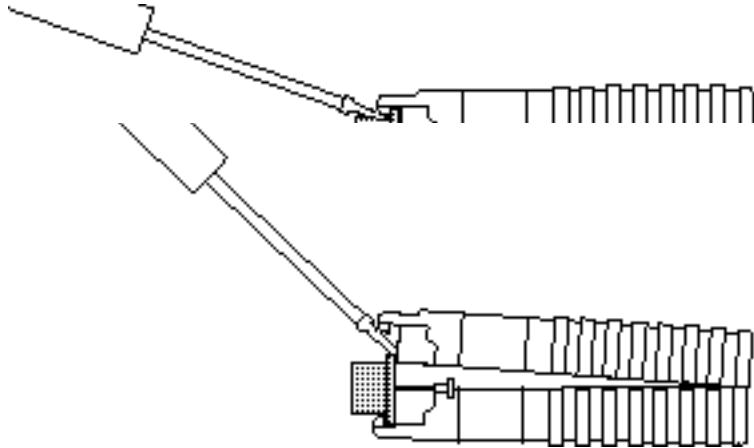
3.2 CONNECTING THE LINE SIDE

Depending upon the type of unit, the Model 1002 connects to the line side via single twisted pair (terminal block, RJ-11, RJ-45) or coax (BNC). Follow the appropriate instruction set for the type of unit you have.

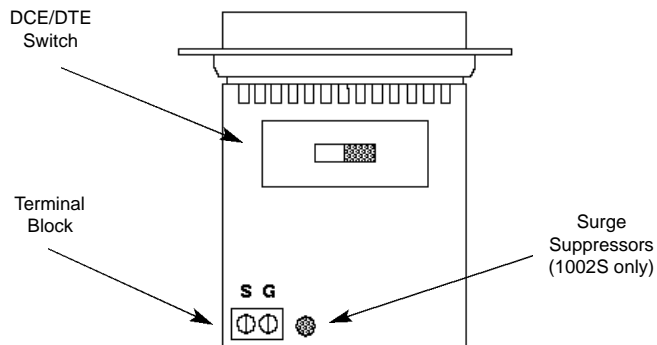
3.2.1 Connection Using the Terminal Block

Terminal blocks are used to connect a single pair of bare wires to the Model 1002. The following instructions will tell you how to open the case, connect the bare wires and fasten the strain relief collar in place.

1. Open the unit by gently inserting a screwdriver between the DB-25 connector and the lip of the plastic case (see below). You don't have to worry about breaking the plastic, but be careful not to bend the D-sub connector.



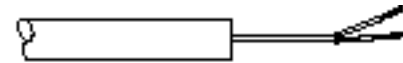
Having opened the unit's case, you will find the terminal block mounted at the rear of the PC board (see below). The terminals are labeled "S" for "signal" and "G" for "ground".



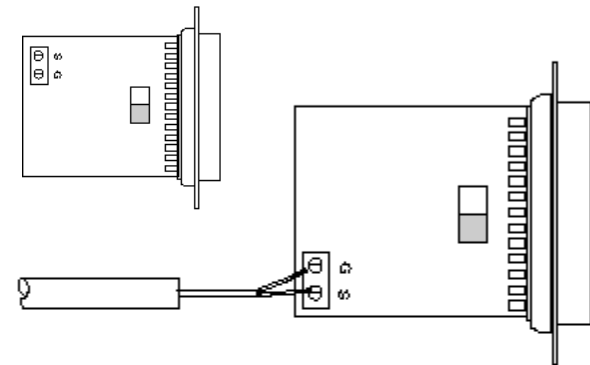
2. Strip the outer insulation from the twisted pairs about one inch from the end.



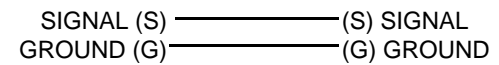
3. Strip back the insulation on each of the 2 wires about .25".



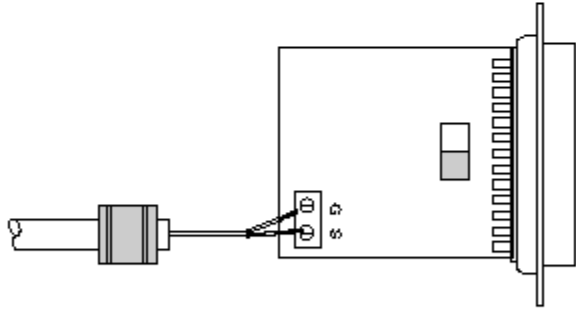
4. Insert the two wire data line to the center (signal) and shield (ground) terminal posts, then tighten the screws. Depending on version, terminal post locations may vary.



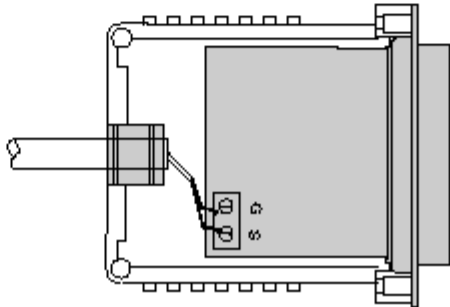
NOTE: Be sure that all cabling between the short range modems is straight through:



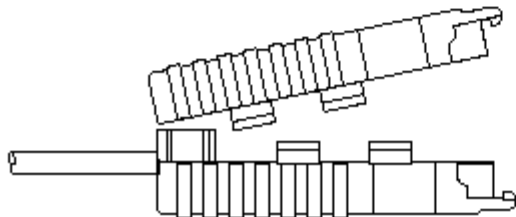
- Place the 2 halves of the strain relief assembly on either side of the telephone wire and press together very lightly. Slide the assembly until it is 2 inches from the terminal posts and press together firmly.



- Insert the strain relief assembly and connected wire into the slot in the bottom half of the modem case; set it into the recess in the case. (If the telephone wire does not fit into the strain relief assembly, call Patton's sales department to obtain a new assembly).



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



- Insert one captive screw through a saddle washer and then insert the entire piece through the hole in the DB-25 end of the case. Snap that side of the case closed. Repeat on other side. This completes installation.

3.2.2 Connection Using RJ-11 and RJ-45 Jacks

When using the RJ-11 or RJ-45 modular jacks it is necessary to use "straight through" cabling between the modems as shown below:

RJ-11 JACKS

<i><u>SIGNAL</u></i>	<i><u>PIN#</u></i>	<i><u>COLOR†</u></i>	<i><u>COLOR</u></i>	<i><u>PIN#</u></i>	<i><u>SIGNAL</u></i>
DATA	3	Green	Green	3	DATA
GND	4	Red	Red	4	GND

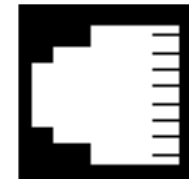
RJ-45 JACKS

<i><u>SIGNAL</u></i>	<i><u>PIN#</u></i>	<i><u>COLOR†</u></i>	<i><u>COLOR</u></i>	<i><u>PIN#</u></i>	<i><u>SIGNAL</u></i>
DATA	4	Red	Red	4	DATA
GND	5	Green	Green	5	GND

† Standard color codes—yours may be different



- 1 - Blue
- 2 - Yellow
- 3 - Green
- 4 - Red
- 5 - Black
- 6 - White

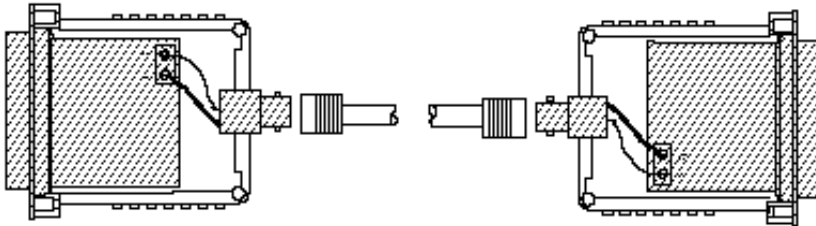


- 1 - Blue
- 2 - Orange
- 3 - Black
- 4 - Red
- 5 - Green
- 6 - Yellow
- 7 - Brown
- 8 - Slate

AT & T standard color codes:

3.2.3 Connection Using Coax (BNC)

If you have the coax version of the Model 1002, simply connect the BNC mating connectors to both modems.



APPENDIX A

PATTON MODEL 1002 SPECIFICATIONS

Transmission Format:	Asynchronous
Transmit Line:	2 wire unconditioned twisted pair or coaxial cable
Transmit Mode:	Full or half duplex
Transmit Level:	0 dBm
Control Signals:	DSR and DCD turn "ON" immediately after the terminal raises DTR; CTS turns "ON" immediately after the terminal raises RTS
Surge Protection:	Compliant with IEC 801.5 level 2, 1kV (Model 1002S Only)
Data Rate:	0 to 19.2 Kbps
Range:	2.0 miles @ 0 to 9600 bps 5.0 miles @ 19,200 bps
Power:	No external power required, derives required power from RS-232 input signals
Size:	2.20" x 1.75" x 0.75" (5.6 x 4.4 x 1.9 cm)
Temperature:	32° to 140°F
Humidity:	95% non-condensing

APPENDIX B

PATTON MODEL 1002 CABLE RECOMMENDATIONS

The Patton Model 1002 operates at frequencies of 20kHz or less and has been performance tested by Patton technicians using twisted-pair cable with the following characteristics:

<u>Wire Gauge</u>	<u>Capacitance</u>	<u>Resistance</u>
19 AWG/.9mm	83nf/mi or 15.72 pf/ft.	.0163 Ohms/ft.
22 AWG/.6mm	83nf/mi or 15.72 pf/ft.	.0326 Ohms/ft.
24 AWG/.5mm	83nf/mi or 15.72 pf/ft.	.05165 Ohms/ft.

To gain optimum performance from the Model 1002, please keep the following guidelines in mind:

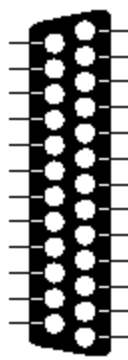
- Always use **twisted pair** wire—this is not an option.
- Use twisted pair wire with a capacitance of 20pf/ft or less.
- Avoid twisted pair wire thinner than 26 AWG (i.e. avoid higher AWG numbers than 26)
- Use of twisted pair with a resistance greater than the above specifications may cause a reduction in maximum distance obtainable. Functionality should not be affected.
- Environmental factors too numerous to mention can affect the maximum distances obtainable at a particular site. Use “maximum distance” figures as a **general guidelin only**.

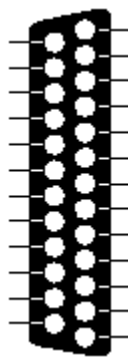
Model 1002 Distance Table in Miles (km)

<i>Data Rate (bps)</i>	<i>Wire Gauge</i>		
	19 AWG (0.9 mm)	24 AWG (0.5 mm)	26 AWG (0.4 mm)
19,200	2.2(3.5)	1.6(2.6)	1.2(1.9)
9,600	3.0(4.8)	2.1(3.4)	1.6(2.6)
4,800	4.3(6.4)	2.6(4.2)	1.7(2.7)
2,400	5.3(8.5)	2.8(4.5)	1.8(2.9)
1,200	5.6(9.0)	2.8(4.5)	1.8(2.9)

APPENDIX C

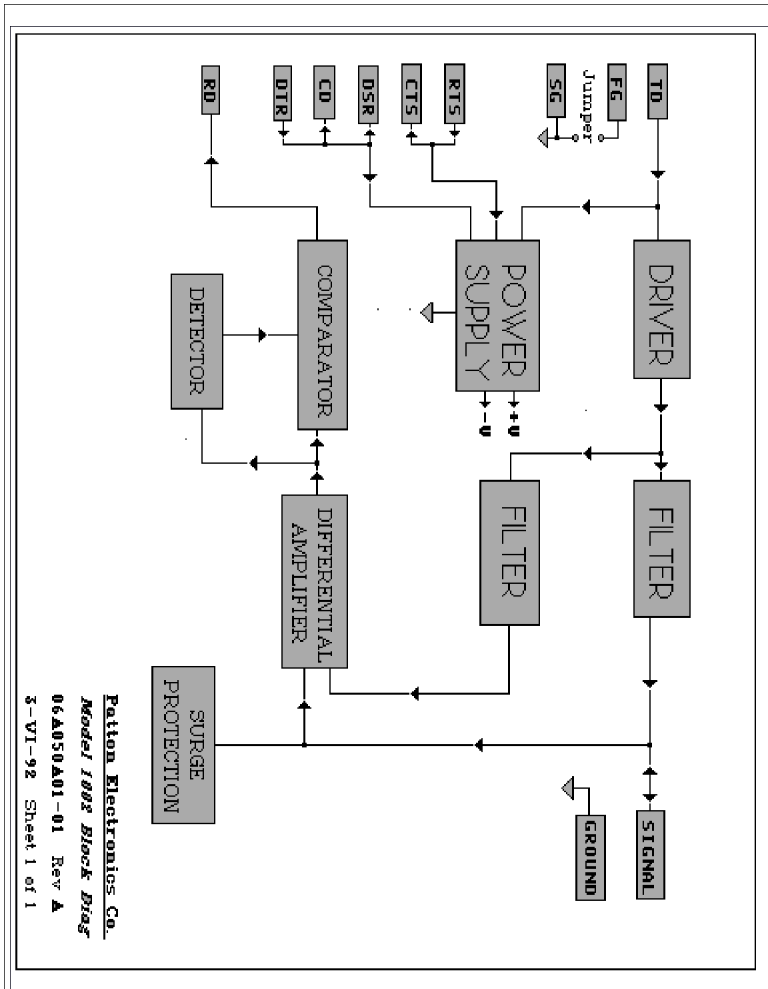
PATTON MODEL 1002 INTERFACE CONNECTIONS

<i>DIRECTION</i>	<i>STANDARD “DCE” SETTING</i>	<i>DIRECTION</i>
To Model 1002		1- (FG) Frame Ground 2- (TD) Transmit Data 3- (RD) Receive Data 4- (RTS) Request to Send 5- (CTS) Clear to Send 6- (DSR) Data Set Ready 7- (SG) Signal Ground 8- (DCD) Data Carrier Detect
		To Model 1002 From Model 1002 To Model 1002 From Model 1002 From Model 1002 From Model 1002

<i>DIRECTION</i>	<i>STANDARD “DTE” SETTING</i>	<i>DIRECTION</i>
From Model 1002		1- (FG) Frame Ground 2- (TD) Transmit Data 3- (RD) Receive Data 4- (RTS) Request to Send 5- (CTS) Clear to Send 6- (DSR) Data Set Ready 7- (SG) Signal Ground 8- (DCD) Data Carrier Detect
		From Model 1002 To Model 1002 From Model 1002 To Model 1002 To Model 1002 To Model 1002

APPENDIX D

PATTON MODEL 1002 BLOCK DIAGRAM



Patton Electronics Co.
 Model 1002 Block Diag
 06A050A01-01 Rev A
 5-VI-92 Sheet 1 of 1