

# USER MANUAL

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## MODEL 1000R and 1000RS

Async. Short Range  
Modem for Modular  
EIA/TIA-561 Systems



**PATTON**  
**Electronics Co.**



An ISO-9001  
Certified Company

Part #07M1000R-B  
Doc. #082011UB  
Revised 04/28/98

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

## 1.0 WARRANTY INFORMATION

**Patton Electronics** warrants all Model 1000R 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 1000R 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 1000R 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 1000R does cause interference to radio or television reception, which can be determined by disconnecting the modem, 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 1000R. 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

- Connects directly to the EIA/TIA-561 device
- Range to 17 miles (27.2 km)
- Data rates to 19,200 bps
- No AC power or batteries required
- Miniature size fits in tight locations
- RJ-11 and RJ-45 twisted pair connection
- Silicon Avalanche Diode surge protection (1000RS only)
- Compatible with Patton Models 1000, 1009 and 1015
- Made in USA

### 2.2 DESCRIPTION

**The Patton Model 1000R** Low-Cost Short Range Modem allows an EIA/TIA-561 device to communicate with RS-232 devices at distances up to 17 (27.2 km) miles over two unconditioned twisted pair. Supporting asynchronous data rates to 19.2 Kbps, the Model 1000R requires no AC power or batteries.

Measuring only 2.0" x 1.7" x .8" (5.1 x 4.3 x 2.0 cm), the Model 1000R is housed in an ABS plastic case. Connection to the EIA/TIA-561 serial port is achieved using a modular RJ-45 jack. Connection to the twisted pair interface is made through either an RJ-11 jack or an RJ-45 jack. The serial device at the other end of the twisted pair cable can be connected to the Model 1000R using a Patton Model 1000 (DB-25), 1009 (DB-9), 1015 (DB-15) or another Model 1000R.

The Model 1000S 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 1000S is compliant with IEC 801.5 level 2, 1kV.

## 3.0 INSTALLATION

The Model 1000R is easy to install. This section tells you how to properly connect the Model 1000R to the twisted pair and EIA/TIA-561 interfaces, and how to operate the Model 1000R.

### 3.1 CONNECTION TO THE TWISTED PAIR INTERFACE

The Model 1000R supports data-only communication between an EIA/TIA-561 device and another serial device. There are two requirements for installation:

1. These units work in pairs. Therefore, you must have one Model 1000R or compatible modem at each end of a two twisted pair cable.
2. To function properly, the Model 1000R needs two twisted pairs of metallic wire. The pairs must be unconditioned, dry metallic wire, between 19 and 26 AWG (the higher number gauges may limit distance). Standard dial-up telephone circuits or leased circuits that run through signal equalization equipment are not acceptable.

For your convenience, the Model 1000R is available with two different twisted pair interfaces: an RJ-11 jack or an RJ-45 jack.

#### 3.1.1 TWISTED PAIR CONNECTION USING RJ-11 OR RJ-45

The RJ-11 and RJ-45 connectors on the Model 1000R's twisted pair interface are pre-wired for a standard TELCO wiring environment (see Figure 1). The table on the following page shows the signal/pin relationships.

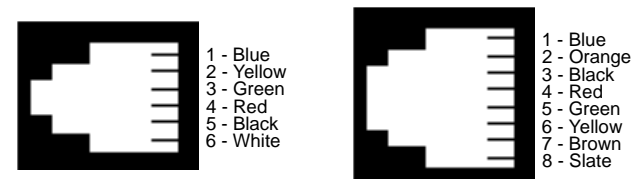


Figure 1. AT&T standard modular color codes

<u>RJ- 1</u>	<u>SI GNAL</u>	<u>RJ- 45</u>	<u>SI GNAL</u>
1-----	GND <sup>†</sup>	1-----	N/C
2-----	RCV-	2-----	GND <sup>†</sup>
3-----	XMT+	3-----	RCV-
4-----	XMT-	4-----	XMT+
5-----	RCV+	5-----	XMT-
6-----	GND <sup>†</sup>	6-----	RCV+
		7-----	GND <sup>†</sup>
		8-----	N/C

When connecting two Model 1000Rs, it is necessary to use a “crossover” cable. The diagram below shows how a crossover cable should be constructed for an environment where both Model 1000Rs use a 4-wire RJ-11 connector. Similar logic should be followed when using an RJ-45 connector or a combination of the two.

<u>SIGNAL</u>	<u>PIN#</u>	<u>COLOR<sup>†</sup></u>	<u>COLOR</u>	<u>PI N#</u>	<u>SI GNAL</u>
GND <sup>†</sup>	1	Blue-----	White	6	GND <sup>†</sup>
RCV-	2	Yellow-----	Red	4	XMT-
XMT+	3	Green-----	Black	5	RCV+
XMT-	4	Red-----	Yellow	2	RCV-
RCV+	5	Black-----	Green	3	XMT+
GND <sup>†</sup>	6	White-----	Blue	1	GND <sup>†</sup>

<sup>†</sup>Connection to ground is optional  
<sup>†</sup>Standard color codes—yours may be different

### 3.2 CONNECTI ON TO THE EI A/ TI A- 561 SERIAL PORT

Every serial device connected to the Model 1000R must have a special interface cable that conforms to the EIA/TIA-561 standard. On one end, this cable must have a male RJ-45 plug, on the other end, it must have a connector that fits into your serial device. The diagram on the following page shows the pin connections for the Model 1000R. Connect each pin to the appropriate connection on your serial device.

### Model 1000R EI A/ TI A- 561 8 Position Interface :

<u>Pin No.</u>	<u>Function</u>
1-----	DSR
2-----	DCD
3-----	DTR
4-----	SG
5-----	RD
6-----	TD
7-----	CTS
8-----	RTS

### 3.3 OPERATING THE MODEL 1000R

Once the Model 1000R is properly installed, it should operate transparently—as if it were a standard cable connection. Operating power is derived from the EIA/TIA-561 data and control signals; there is no “ON/OFF” switch.

**APPENDIX A**

**PATTON MODEL 1000R SPECIFICATIONS**

**Transmission Format:** Asynchronous  
**Data Rate:** 0 to 19,200 bps  
**Distance:** See table below  
**Surge Protection:** Compliant with IEC 801.5 level 2, 1kV (Model 1000RS only)  
**Control Signal:** DCD (pin 2) and DSR (pin 1) turn on when modem is powered up (connected); CTS (pin 7) turns on immediately after the terminal raises RTS (pin 8)  
**Transmit Line:** 4-wire, unconditioned line  
**Transmit Mode:** Full duplex, 4-wire  
**Transmit Level:** 0 dBm  
**Line Connection:** RJ-11, RJ-45  
**Power Supply:** No external power required, uses ultra low power from data and control signals  
**Temperature:** 32° to 140°F  
**Humidity:** 95% non-condensing  
**Size:** 2.0" x 1.7" x 0.8" (5.1 x 4.3 x 2.0 cm)

**APPENDIX B**

**PATTON MODEL 1000R CABLE RECOMMENDATIONS**

The Patton Model 1000R 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 guideline only**.

*Model 1000 Distance Table in Miles (km)*

<b>Data Rate (bps)</b>	<b>Wire Gauge</b>		
	19 AWG (0.9 mm)	24 AWG (0.5 mm)	26 AWG (0.4 mm)
19,200	6.2(9.9)	3.7(5.9)	1.2(1.9)
9,600	7.5(12.0)	4.9(7.8)	2.5(4.0)
4,800	8.7(13.9)	5.6(9.0)	3.7(5.9)
2,400	11.8(18.9)	8.0(12.8)	4.9(7.8)
1,200	17.0(27.2)	11.8(18.9)	8.0(12.8)

APPENDIX B

PATTON MODEL 1000R BLOCK DIAGRAM

