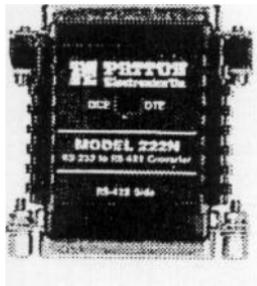


USER MANUAL

MODEL 222N and 222NS

Miniature RS-232 to RS-422 Converters



PATTON
Electronics Co.

2.1 FEATURES

- . Bi-directionally converts RS-232 signals to balanced RS-422
- . DCE/DTE switch selectable on RS-232 interface
- . Supports transmit and receive data (X-ON/X-OFF flow control)
- . Loops back all handshaking signals on the RS-232 interface
- . Very thin case (.75") for closely spaced computer ports
- . No AC power or batteries required-draws all necessary operating power from RS-232 interface
- . Supports data rates to 19.200 bps

2.2 DESCRIPTION

The Patton Model 222N interface converter allows computers, terminals and modems employing the RS-232E interface to communicate with devices using RS-422 balanced electrical signals. This unit derives the necessary power for operation from the data and control voltages on the RS-232 interface. The 222N features bi-directional data conversion at full or half duplex at distances up to 3.5 miles.

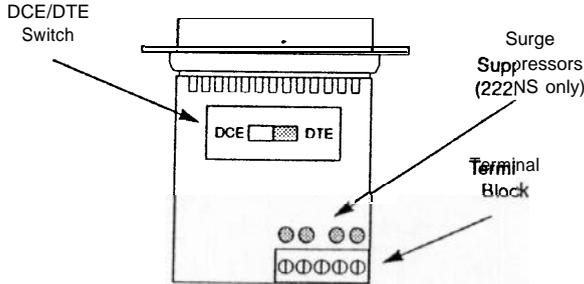
An external DCE/DTE switch lets you connect to the serial port of either a computer/terminal (DTE) or a modem (DCE) without using a crossover cable. The Model 222N is available with several RS-422 interface options: DB-25 male or female (following the RS-530 standard), RJ-11, RJ-45, or terminal blocks with strain relief.

The surge protected Model 222NS uses high speed avalanche diodes to intercept data line transient surges and shunt them safely to chassis ground. With surge handling capacity of 600W per wire at 1 mS, the 222NS can protect itself and connected equipment from nearby lightning strikes, and other surges of electromagnetic radiation.

3.0 CONFIGURATION

The Model 222N is designed to be easy to use. There are no internal jumpers or DIP switches to set, so there is no need to open the case to configure the unit (you may need to open the **case** for wire connection-refer to section 4.0). The only configuration necessary for operation is proper setting of the external DTE/DCE switch.

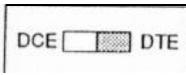
The figure below shows the location of the DTE/DCE switch on the PC board, as well as the location of the terminal block and surge suppressors ("S" model only).



3.1 SETTING THE DTE/DCE SWITCH

For your convenience, the Model 222N has an externally accessible DTE/DCE switch (see diagram below). If the device connected to the Model 222N is a modem or multiplexer (or is wired like one), set the switch to "DTE". This setting causes the Model 222N to behave like Data Terminal Equipment and transmit data on pin 2.

If the device connected to the Model 222N is a PC, terminal or host computer (or is wired like one), set the switch to "DCE". This setting causes the Model 222N to behave like Data Communications Equipment and transmit data on pin 3.



4.0 INSTALLATION

Once you have properly configured the DTE/DCE switch, you are ready to connect the Model 222N to your system. This section tells you how to properly connect the Model 222N to the RS-422 and RS-232 interfaces, and how to operate the Model 222N.

4.1 CONNECTION TO THE RS-422 INTERFACE

The Model 222N supports data-only communication distances up to 4000 feet between itself and the RS-422 device. To function properly, the Model 222N must have two twisted pairs of metallic wire. These pairs must be dry, unconditioned metallic wire, between 19 and 26 AWG (the higher number gauges may limit distance somewhat).

For your convenience, the Model 222N is available with several different physical interfaces on the RS-422 side: DB-25 (following the RS-530 standard), RJ-11 jack, RJ-45 jack, and terminal blocks with strain relief.

4.1.1 RS-422 CONNECTION USING THE DB-25

The DB-25 connector on the Model 222N's RS-422 side conforms to the RS-530 interface standard. When connecting to an RS-422 device that also conforms to the RS-530 standard, your cable should be *crossed over* in the manner shown below:

MODEL 222N		AS-422 (530) DEVICE	
SIGNAL	DB-25 PIN	DB-25 PIN	SIGNAL
XMT+	2	3	RCV+
XMT-	14	16	RCV-
RCV+	3	2	XMT+
RCV-	16	14	XMT-

The DB-25 connector that is farthest from the DTE/DCE switch

NOTE: It is not necessary that the RS-422 device adhere to the RS-530 standard. However, you must make sure that the signals, polarities, and pairing of your connection conform to the above diagram.

4.1.2 RS-422 CONNECTION USING RJ-11 OR RJ-45

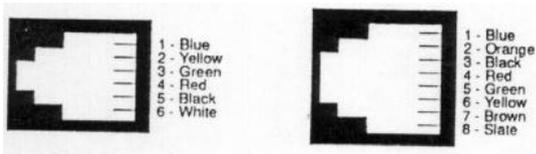
The RJ-11 and RJ-45 connectors on the Model 222N's RS-422 side are pre-wired for a standard 'TELCO' wiring environment. The signal/pin relationships are shown below:

RJ-11	SIGNAL	RJ-45	SIGNAL
1	GND'	1	N/C
2	RCV-	2	GND'
3	XMT+	3	RCV-
4	XMT-	4	XMT+
5	RCV+	5	XMT-
6	GND	6	RCV+
		7	GND
		8	N/C

In most modular RS-422 applications, it is necessary to use a "cross over" cable. The diagram below shows how a cross over cable should be constructed for an environment where both the Model 222N and the RS-422 device use a 6-wire RJ-11 connector. Similar logic should be followed when using RJ-45 connectors or a combination of the two.

MODEL 222N			RS-422 DEVICE		
SIGNAL	PIN	COLOR	<u>COLOR</u>	PIN#	422 SIGNAL
GND'	1	Blue	NC		
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'	6	White	NC		

'Connection to ground is optional

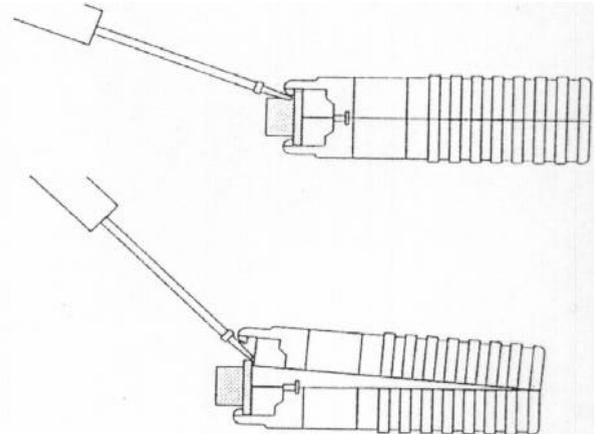


*Standard AT&T color codes-yours may be different

4.1.3 RS-422 CONNECTION USING TERMINAL BLOCKS

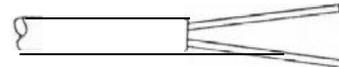
If your RS-422 application requires you to connect two pairs of bare wires to the Model 222N, you will need to open the case to access the terminal blocks. The following instructions will tell you how to open the case, connect the bare wires to the terminal blocks, and fasten the strain relief collar in place so that the wires won't pull loose.

1. 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.



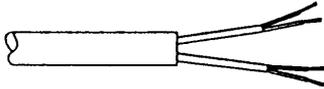
Once the unit has been opened, you will be able to see the terminal blocks located at the rear of the PC board.

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



4.3 OPERATING THE MODEL 222N

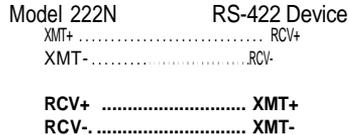
3. Strip back the insulation on each of the 2 twisted pair wires about .25".



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.

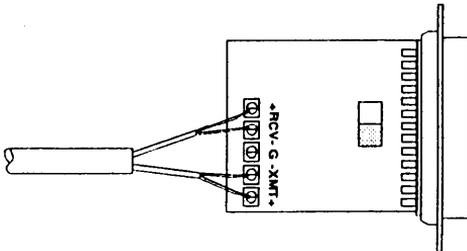
5. Connect the other pair of wires to RCV+ and RCV- (receive positive and negative) on the terminal block, again making careful note of which color is positive, and which color is negative.

Ultimately, you will want to construct a two pair cross over cable that makes a connection with the RS-422 device as shown below:



6. If there is a shield around the telephone cable, it may be connected to 'G' on the terminal block. To avoid ground loops, we recommend connecting the shield at the computer end only. A ground wire is not necessary for proper operation of the Model 222N.

7. When you finish connecting the wires to the terminal block, the assembly should resemble the diagram below:



Once the Model 222N 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-422 interfaces are passed straight through. All control signals from the RS-232 interface are looped back.

(Note: If your system requires hardware flow control, you will need the Patton Model 265 RS-232 to RS-485 converter. Call Patton Customer Service at 301-975-1007).

APPENDIX A SPECIFICATIONS

Date Rates: 19,200 bps (according to the RS-232 interface)

Transmission Format: Asynchronous

Transmission Mode: Full/half duplex

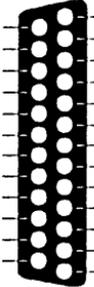
Power: AC power not required, derives approximately 3mA from RS-232 data and control voltages

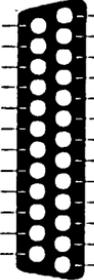
Surge Protection: 600W surge power dissipation at 1 mS (1011 000uS waveform) and response time of 1 pS

Factory Switch Setting: DCE; data is received from the remote short range modem via RX+ and RX-, and is sent to the DTE from the Model 222N via pin 3 of the RS-232 interface; (the RS-232 interface is the DB-25 connector closest to the DTE/DCE switch)

Dimensions: 2.20' x 1.75' x .75'

APPENDIX B
RS-232C PIN CONFIGURATIONS

DIRECTION	STANDARD "DCE" SETTING	DIRECTION
To Model 222N	 <ul style="list-style-type: none"> 1-(FG) Fram 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 222N From Model 222N To Model 222N From Model 222N From Model 222N
	Data Term. Ready (DTR) - 20	

DIRECTION	STANDARD "DTE" SETTING	DIRECTION
From Model 222N	 <ul style="list-style-type: none"> 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 222N To Model 222N From Model 222N To Model 222N To Model 222N
	Data Term. Ready (DTR) - 20	

APPENDIX C
BLOCK DIAGRAM

