USER MANUAL

MODEL 1000CC
RS-232 Rack Mount Controller Card

PATTON Electronics Co.

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1.0 WARRANTY INFORMATION

Patton Electronics warrants all Model 1000CC 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 1000CC 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 1000CC 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 1000CC does cause interference to radio or television reception, which can be determined by turning the power off or disconnecting the RS-232 interface, the user is encouraged to try to correct the interference by one 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 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 at **(301) 975-1007**. *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 1000CC. 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

- Lets an async RS-232 terminal configure or dial Patton's 2500RC Series of CSU/DSU rack cards

- Fits in Patton's rack chassis and Cluster Boxes

- Supports RS-232 terminal data rates to 19.2 Kbps

- Daisy chain capability lets one terminal control many racks

- Works in conjunction with Patton short range modem rack cards to provide remote daisy chain option

2.2 DESCRIPTION

The Model 1000CC RS-232 Rack Mount Controller Card fits in Patton's rack chassis and Cluster Boxes and allows the 2500RC family of CSU/DSUs to be configured and controlled from an asynchronous RS-232 terminal. Taking up one card slot, the Model 1000CC provides one modular port for connection of an RS-232 terminal, and a second modular port for daisy-chaining between racks. The user wishing to "dial" or configure a particular CSU/DSU card simply keys in an addressable command, which the Model 1000CC passes along to all the cards in the rack. The appropriate card recognizes its address and responds to the command.

Daisy-chaining with one or more other racks containing a Model 1000CC can be done locally or remotely. To accomplish remote daisy-chaining, the daisy-chain port of a Model 1000CC is connected to a Patton short range modem card. The terminal link is then driven to a remote rack with a second short haul and a Model 1000CC. Combining local and remote daisy chaining, a single RS-232 terminal can control a whole network of Patton CSU/DSUs. The Model 1000CC has front panel LED indicators for Power, TD and RD. A special rear card, the Model 1000RCM1C45, is supplied with the unit. Other rear cards are also compatible with the Model 1000CC.

3.0 CONFIGURATION

The Model 1000CC has no configuration straps or switches, except those associated with the rear card. These are described below.

3.1 REAR CARD CONFIGURATION

The rear card supplied with the Model 1000CC is equipped with two modular RJ-45 jacks (see Figure 1, below). The jack labeled "A1" is for connection to the RS-232 terminal. If the Model 1000CC is being used in a daisy-chain application, port "B1" provides the link to the next Model 1000CC in the chain.
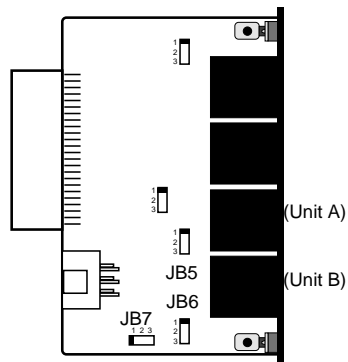

Figure 1. Strap locations for both rear cards

3.1.1 REAR CARD STRAP SETTINGS

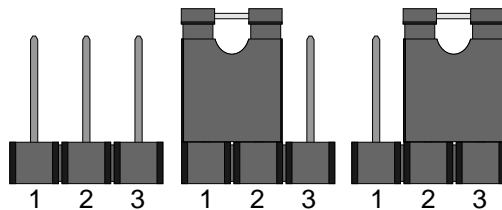Figure 2 (below) shows the two possible settings for each strap. The PC board is labeled with the "123" orientation.

Figure 2. Orientation of interface card straps

SGND & FRGND (JB5)

In the connected (closed) position, this strap links signal ground and frame ground. In the open (disconnected) position, pin 1 is "lifted" from frame ground.

> JB5
> Position 1&2 = SGND and FRGND Connected
> Position 2&3 = SGND and FRGND Not Connected

DTE as DSR or RI (JB6 & JB7)

Because this rear card is designed to function in more applications than the Model 1000CC, this jumper must be installed only in one position. Place the jumper across pins 1&2 so that the terminal (DTE) sees DSR as high when the DTE raises DTR. The other positions, across pins 2&3, are for Ring Indicate as defined by EIA/TIA-561. The RI function is irrelevant (and on the Model 1000CC is also disconnected) and can cause improper operation if the jumper is installed incorrectly.

> JB6 & JB7
> Position 1&2 = DSR
> Position 2&3 = N/A

This section describes the functions of the Model 1000R16P rack chassis, tells how to install front and rear Model 1000CC cards into the chassis and provides diagrams for wiring up the interface connections correctly.

4.1 THE MODEL 1000R16P RACK CHASSIS

The Model 1000R16P Rack Chassis (Figure 3, below) has sixteen short range modem card slots, plus its own power supply. Measuring only 3.5" high, the Model 1000R16P is designed to occupy only 2U in a 19" rack. Sturdy front handles allow the Model 1000R16P to be extracted and transported conveniently.
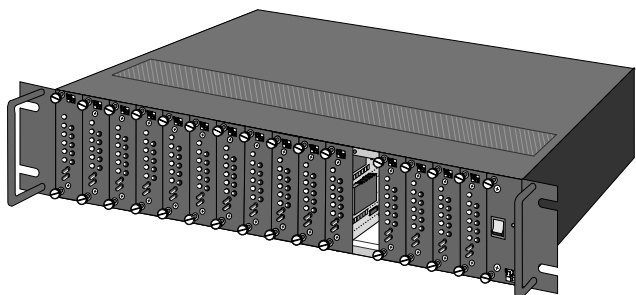

Figure 3. Model 1000R16P Rack Chassis with power supply

4.1.1 THE RACK POWER SUPPLY

The power supply included in the Model 1000R16P rack uses the same mid-plane architecture as the modem cards. The front card of the power supply slides in from the front, and the rear card slides in from the rear. They plug into one another in the middle of the rack. The front card is then secured by thumb screws and the rear card by conventional metal screws.

Switching the Power Supply On and Off

The power switch is located on the front panel. When plugged in and switched on, a red front panel LED will glow. Since the Model 1000R16P is a "hot swappable" rack, *it is not necessary for any cards to be installed before switching on the power supply*. The power supply may be switched off at any time without harming the installed cards.

Replacing the Power Supply Fuse

The rack chassis power supply uses a 400mA fuse for 120V AC circuits, and a 200mA fuse for 240V AC circuits. The fuse compartment is located just below the AC socket on the rear card. To replace the fuse, follow these steps:

1. Using a small screwdriver, pop the compartment open: It will slide open like a drawer. Depending upon the exact part used, the drawer may slide completely out of the fuse holder or it may stop partway out.

2. Note that there are *two* fuses in the drawer: The front fuse is the spare, the rear fuse is the "active" fuse.

3. If the active fuse appears to be blown, remove it from the clips and replace it with the spare from the front compartment. Note the size and rating of the blown fuse before discarding.

4. Using the part number found in Appendix C, order a new replacement fuse.

Warning: For continued protection against the risk of fire, replace only with the same type and rating of fuse.

Switching the Power Supply Between 120 and 240 Volts

Although the Model 1000R16P is shipped from the factory with a customer-specified power supply configuration, you may change the configuration yourself. Here are the steps to switch the configuration of the power supply between 120V and 240V AC:

1. Remove the front power supply card and locate the two position switch near the back of the card. Slide the switch to the desired voltage (Note: The actual values on the switch may be "110/220" or "115/230").

2. Replace the existing fuse with one of the correct value (see Appendix C for the appropriate fuse).

3. Replace the power supply cord, if necessary (see Appendix C for the appropriate power cord).

4.2 INSTALLING THE MODEL 1000CC INTO THE CHASSIS

The Model 1000CC is comprised of a front card and a rear card. The two cards meet inside the rack chassis and plug into each other via mating 50 pin card edge connectors. The following steps demonstrate the installation of the Model 1000CC into the chassis:

1. Slide the rear card into the back of the chassis along the metal rails.

2. Secure the rear card using the metal screws provided.

3. Slide the front card into the front of the chassis. It should meet the rear card when it's almost all the way into the chassis.

4. Push the front card *gently* into the card-edge receptacle of the rear card. It should "click" into place.

5. Secure the front card using the thumb screws.

Note: Since the Model 1000R16P chassis allows "hot swapping" of cards, it is not necessary to power down the rack when you install or remove a Model 1000CC.

4.3 RS-232 TERMINAL CONNECTION (PORT "A1")

The 10-pin RJ-45 port labeled "A1" is wired as a DCE, and is designed to connect to a the serial port of an RS-232 terminal (DTE). This port is pinned according Patton's Modified Modular Interface Standard, which is based on the EIA/TIA-561 Standard (for specific pinouts, see **Appendix C**). Note: DSR, CTS and CD outputs are always "high" (+8V).

When making a connection between port A1 and the serial port of an RS-232 terminal, your cable should be wired *straight through*. Note: if your terminal device does not have a modular RJ-45 port, you will need to construct an adapter cable according to the pinouts in **Appendix C**. A pre-made DB-25 to RJ-45 adapter is also available from Patton Electronics. This may be used in conjunction with a straight through modular cable (also available from Patton). Refer to **Appendix B** for the correct part number when ordering these items.

4.4 RS-232 DAISY CHAIN CONNECTION (PORT "B1")

The 10-pin RJ-45 port labeled B1 is wired as a DTE, and is designed to connect to port A1 of another Model 1000CC. Like port A1, this port is pinned according Patton's Modified Modular Interface

Standard (based on the EIA/TIA-561Standard). For daisy chain connection between racks, use an 8 or 10 position modular cable wired *straight through*.

Note[1]: DTR and RTS outputs are always "high" (+8V).

Note[2]: The DSR input must be "high" in order fo the daisy chain port to operate. This is provided automatically when the B1 port is connected to the A1 port of another Model 1000CC.

4.4.1 LOCAL DAISY CHAIN TOPOLOGY

Figure 4 (below), shows a typical daisy chain connection using a remote terminal, two racks and two Model 1000CCs. Using this type of topology, one terminal can control several racks in the same location.
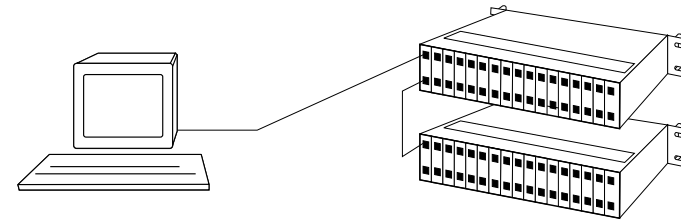

Figure 4. Local daisy chain.

To wire up a local Model 1000CC daisy chain connection, follow these steps:

1) Using a straight through modular cable, connect the serial port of the RS-232 terminal to Port A1 of the first Model 1000CC in the chain.

2) Using a straight through modular cable, connect Port B1 of the first Model 1000CC in the chain to port A1 of the second Model 1000CC in the chain. Follow the same procedure from the second to the third Model 1000CC (and so on) if there are additional units in the chain.

4.4.2 REMOTE DAISY CHAIN TOPOLOGY

In some applications it may be desirable to control a local rack and a remote rack using the same local RS-232 terminal. This can be accomplished using two of Patton's RS-232 short range modem cards in addition to the Model 1000CCs.

Figure 5 (below) shows how a remote daisy chain set-up might look. It is also possible to combine this remote daisy chaining method with the local daisy chaining method described in Section 4.4.1.
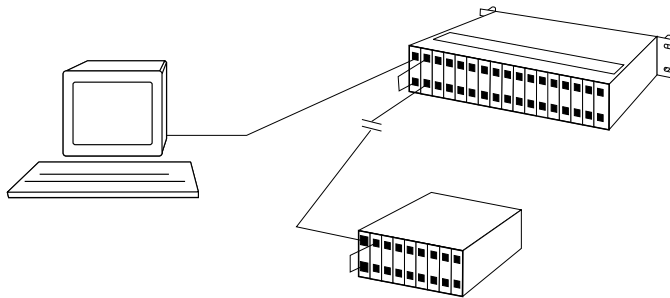

Figure 5. Remote daisy chain

To wire up a remote Model 1000CC daisy chain connection, follow these steps:

1) Using a straight through modular cable, connect the serial port of the RS-232 terminal to Port A1 of the local Model 1000CC.

2) Using a *straight through* modular cable, connect Port B1 of the local Model 1000CC to port A1 to the RS-232 port of a Patton asynchronous short range modem card (ex. the Model 1000RC).

3) Following the instructions in the User Manual for the particular Patton short range modem card you are using, connect the "line" port of the local short range modem card to "line" port of the remote short range modem card. This connection should be made in the normal manner, using twisted pair cable.

4) Connect the serial (RS-232) port of the remote Patton short range modem card to Port A1 of the remote Model 1000CC. Since both ports are configured as DCE, you will need to use a modular RJ-45 *crossover* cable pinned in the following manner:

RJ-45 Crossover Cable (4-Wire)

SIGNAL	PIN#	PIN#	SIGNAL
DSR	2----------------------4		DTR
DTR	4----------------------2		DSR
RD	6----------------------7		TD
TD	7----------------------6		RD
GND	5----------------------5		GND

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5.0 OPERATION

Once you have configured each Model 1000CC and connected the cables, you are ready to operate the unit. Section 5.0 describes the LED status monitors, the power-up procedure, and use of the Model 1000CC.

5.1 LED STATUS MONITORS

The Model 1000CC features five front panel LEDs that indicate the condition of the modem and communication link. These LEDs operate as follows:

- The green "PWR" LED glows when power is applied to the modem through its mid-plane chassis connection.

- The green "TD" and "RD" LEDs show positive state data activity. The red "TD" and "RD" LEDs show negative state data activity. A solid red light indicates an idle state.

5.2 POWER-UP

There is no power switch on the Model 1000CC: Power is automatically applied to the 1000CC when its card-edge connector touches the chassis' mid-plane socket, or when the chassis' power is turned on. *Note: The 1000CC is a "hot swappable" card—it will not be damaged by plugging it in or removing it while the rack is powered up.*

5.3 CONTROLLING CSU/DSU CARDS

The Model 1000CC has one primary purpose: to receive instructions from an RS-232 terminal and pass them to one or more Patton CSU/DSU rack cards through the midplane bus of a Patton rack chassis or Cluster Box. Once the Model 1000CC is installed and configured properly, you should refer to **Section 4.4 of the Patton Model 2500 Series Manual** for information about control port configuration and control port commands.

Note: Each CSU/DSU card has its own address, which is set using the Address Rotary Switches on the card. In order to receive instructions individually, each card must have a *unique address* (00 - 98). Cards set to "99" will listen to group instructions, but will not be able to discern instructions individually.

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SPECIFICATIONS

Transmission Format: Asynchronous, RS-232

Data Rate: 0 to 19.2 Kbps

RS-232 Connections: dual RJ-45 jacks (one input, one daisy chain output)

Power Supply: Rack-mount power supply is switchable between 120V and 240V AC; rack chassis supplies 10V AC to the Model 1000CC, typical consumption is 700 mW per card

Fuse: 400mA for 120V applications; 200mA for 240V applications

Temperature Range: 0-50°C (32-122°F)

Altitude: 0-15,000 feet

Humidity: Up to 95% non-condensing

Dimensions: 0.95"w x 3.1"h x 5.4"l

FACTORY REPLACEMENT PARTS

   The Patton Model 1000CC rack system features interchangeable rear half cards, power cords/fuses for international various operating environments and other user-replaceable parts. Model numbers and descriptions for these parts are listed below:

Patton Model #	Description
1000RPEM	120/240V Rear Power Entry Module
1000RPSM-1	120/240V Front Power Supply Module
1000RPEM-DC	DC Rear Power Entry Module
1000RPSM-48A	48V Front Power Supply Module
12M-561♦	Serial DB-25 (male) to RJ-45 adapter
12F-561♥	Serial DB-25 (female) to RJ-45 adapter
10-561S♠	RJ-45 to RJ-45 adapter cable, 6 ft.
0805US	American Power Cord
0805EUR	European Power Cord CEE 7
0805EURP	Europlug Power Cord CEE 7/16
0805UK	United Kingdom Power Cord
0805AUS	Australia/New Zealand Power Cord
0805DEN	Denmark Power Cord
0805FR	France/Belgium Power Cord
0805IN	India Power Cord
0805IS	Israel Power Cord
0805JAP	Japan Power Cord
0805SW	Switzerland Power Cord
0516FPB1	Single Width Blank Front Panel
0516FPB4	4-Wide Blank Front Panel
0516RPB1	Single Width Blank Rear Panel
0516RPB4	4-Wide Blank Rear Panel
0821R4	400 mA Fuse (5x20mm) Littlefuse 239.400 or equivalent
0821R2	200 mA Fuse (5x20mm) Littlefuse 239.200 or equivalent
056S1	Set of 16 #4 pan head screws/washers

♦ Wired according to EIA-561 Standard
♥ Wired according to EIA-561 Standard
♠ Wired straight through (use with adapters listed above)

APPENDIX C
MODULAR INTERFACE PIN-OUTS

MODULAR INTERFACE - 10 Wire RJ-45 (EIA-561)		
Contact Number	**Circuit**	**Description**
1	N/A	Not Used
2	107	DSR
3	109	Received Line Signal Indicator (CD)
4	108 / 2	DTE Ready (DTR)
5	102	Signal Common
6	104	Received Data
7	103	Transmitted Data
8	106	Clear to Send
9	105 / 133	Request to Send / Ready for Receiving
10	N/A	Not Used

Pins 2-9 conform to the EIA/TIA-561 eight position non-synchronous interface standard.