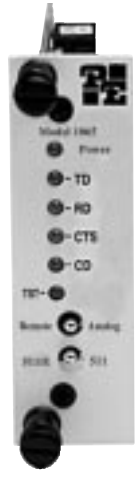
USER MANUAL

MODEL 1065RC

Industrial Synchronous & Asynchronous Short Range Modem: Rack Mount Card



PATTON Electronics Co.

An ISO-9001 Certified Company

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1.0 WARRANTY INFORMATION

Patton Electronics warrants all Model 1065RC 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 1065RC 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 1065RC 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 1065RC does cause interference to radio or television reception, which can be determined by turning the power off or removing the card, 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 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.

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 1065RC. 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 by Patton's qualified technicians. 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

- Synchronous or asynchronous operation
- 2-wire/half duplex or 4-wire/full or half duplex
- V.52 & V.54 test modes
- Equalization
- Anti-streaming timer
- Data rates to 64.0 kbps
- Distances up to 12 miles (19.2 km)
- Point-to-point or multipoint
- Internal, external or received loopback clocking
- Built-in transformer isolation & high speed surge protection
- Mono-color LED indicators
- 2000VAC transformer isolation
- Mounts in Patton's 14-card rack chassis

2.2 DESCRIPTION

The Model 1065RC Series Universal Short Range Modem operates 2-wire (half duplex) or 4-wire (full or half duplex), in synchronous or asynchronous modes at an extended range of 12 miles. It operates at data rates to 64.0 kbps. The Model 1065RC *always* operates in sync. mode between the local and remote modems; when connected to an async. RS-232 device, the Model 1065RC converts the async. data to sync. data

The Model 1065RC has several features to enhance overall performance: equalization, antistreaming timer, transformer isolation and Silicon Avalanche Diode surge protection. The Model 1065RC features V.52 compliant bit error rate pattern tests and two V.54 test modes.

The Model 1065RC is designed to mount in Patton's 2U high 19" rack chassis. This 14-card chassis has a switchable 120VAC/240VAC power supply and mounts cards in a mid-plane architecture. The front card can be plugged into different rear cards. This means that the Model 1065RC card can have several interface options and can be switched with other Patton short haul cards.

3.0 CONFIGURATION

This section describes the location and orientation of the Model 1065RC's configuration switches and provides detailed instructions on setting each of the switches.

The Model 1065RC uses 24 DIP switches that allow configuration to an extremely wide range of applications. These 24 DIP switches are accessible when the card is slid out of the rack chassis. Once configured, the Model 1065RC is designed to operate transparently, without need for frequent re-configuration: just set it and forget it!

3.1 SWITCH LOCATIONS AND ORIENTATION

The Model 1065RC has three sets of eight switches—S1, S2, and S3—which are mounted on the PC board (Figure 1). These configuration switches allow you to select data rates, clocking methods, V.52 & V.54 tests, word lengths, extended signaling rates, async. or sync. mode, 2- or 4-wire operation, antistream control and input impedance. As Figure 2 shows, the orientation of all DIP switches is the same with respect to "ON" and "OFF" positions.

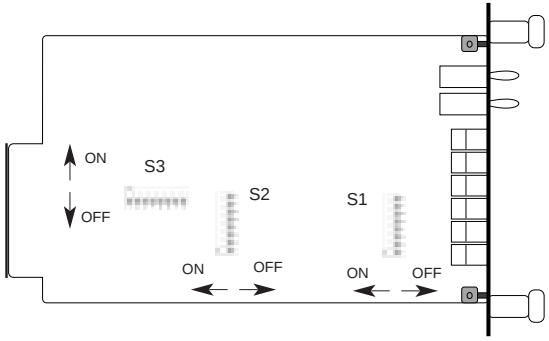


Figure 1. Model 1065RC board, showing location of DIP switches

ON

OFF

Figure 2. Close-up of DIP switches showing "ON" and "OFF" positions

3.2 CONFIGURATION SWITCH SET "S1"

The DIP switches on S1 set data rate, clock source, async./sync. mode and carrier control method. The default settings are summarized in Figure 4.

S1 SUMMARY TABLE			
Position	**Function**	**Factory Default**	
S1-1	Data Rate	On	9,600 bps
S1-2	Data Rate	Off	
S1-3	Data Rate	Off	
S1-4	Data Rate	On	
S1-5	Clock Source	On	Internal
S1-6	Clock Source	On	
S1-7	Async./Sync.	On	Async.
S1-8	Carrier Control	Off	Constantly On

Figure 4. Summary of DIP switch default settings for set S1

S1-1 through S1-4: Data Rate Setting

Switches S1-1 through S1-4 and S3-3 are set in combination to determine the asynchronous and synchronous data rate for the Model 1065RC.

DATA RATE SETTINGS S1-1 THROUGH S1-4 & S3-3					
S1-1	**S1-2**	**S1-3**	**S1-4**	**S3-3**	**SETTINGS**
ON	ON	ON	ON	*OFF*	1.2 kbps
OFF	ON	ON	ON	*OFF*	1.8 kbps
ON	*OFF*	ON	ON	*OFF*	1.4 kbps
OFF	*OFF*	ON	ON	*OFF*	3.6 kbps
ON	ON	*OFF*	ON	*OFF*	4.8 kbps
OFF	ON	*OFF*	ON	*OFF*	7.2 kbps
ON	*OFF*	*OFF*	ON	*OFF*	9.6 kbps

Figure 5: Data Rate Settings S1-1 Through S1-4 & S3-3

DATA RATE SETTINGS S1-1 THROUGH S1-4 & S3-3 (continued)					
S1-1	**S1-2**	**S1-3**	**S1-4**	**S3-3**	**SETTINGS**
OFF	*OFF*	*OFF*	ON	*OFF*	14.4 kbps
OFF	ON	*OFF*	ON	ON	16.0 kbps
ON	ON	ON	*OFF*	*OFF*	19.2 kbps
OFF	ON	ON	*OFF*	*OFF*	28.8 kbps
OFF	*OFF*	*OFF*	ON	ON	32.0 kbps
ON	ON	*OFF*	*OFF*	*OFF*	38.4 kbps
OFF	ON	*OFF*	*OFF*	*OFF*	57.6 kbps
OFF	ON	ON	*OFF*	ON	64.0 kbps

Figure 5.1: Data Rate Settings S1-1 Through S1-4 & S3-3 (continued)

S1-5 and S1-6: Clock Source

Switches S1-5 and S1-6 are set in combination to determine the transmit clock source for the Model 1065RC.

S1-5	S1-6	Setting
On	On	Internal transmit clock
Off	On	Receive recover clock
On	Off	External transmit clock

S1-7: Asynchronous/Synchronous Mode

The setting for switch S1-7 determines whether the Model 1065RC is in asynchronous or synchronous operating mode.

S1-7	Setting
On	Asynchronous
Off	Synchronous

S1-8: Carrier Control Method

The setting for switch S1-8 determines whether the carrier is "constantly on" or "controlled by RTS". This setting allows for operation in switched carrier, multipoint and/or hardware handshaking applications.

S1-8	Setting
Off	Constantly on
On	Controlled by RTS

3.3 CONFIGURATION SWITCH SET "S2"

The DIP switches on S2 set word length, extended signaling rate, RTS/CTS delay, V.52 & V.54 diagnostic tests and 2- and 4-wire operation. The default settings for S2 are shown in Figure 6 below.

S2 SUMMARY TABLE		
Position	**Function**	**Factory Default**
S2-1	Word Length	Off } 10 bits
S2-2	Word Length	Off } 10 bits
S2-3	Extended Signaling Rate	Off -2.5% to 1%
S2-4	RTS/CTS Delay	On } 7 ms
S2-5	RTS/CTS Delay	On } 7 ms
S2-6	2-Wire/4-Wire	On (4-Wire) FDX
S2-7	2-Wire/4-Wire	Off (4-Wire) FDX
S2-8	V.52/V.54	Off V.54 Enabled

Figure 6: Configuration Summary of S2 Switch Settings

Switches S2-1 and S2-2: Word Length

Switches S2-1 and S2-2 are set in combination to determine the word length for asynchronous data, including start and stop pulses.

S2-1	S2-2	Setting
Off	On	8 bits
On	On	9 bits
Off	Off	10 bits
On	Off	11 bits

Switch S2-3: Extended Signaling Rate

The setting for switch S2-3 determines the range of variability the Model 1065 Series "looks for" in asynchronous data rates (i.e., the actual variance from a given frequency level the Model 1065 Series will tolerate).

S2-3	Setting
Off	-2.5% to +1%
On	-2.5% to +2.3%

Switches S2-4 and S2-5: RTS/CTS Delay

The combined settings for switches S2-4 and S2-5 determine the amount of delay between the time the unit "sees" RTS and when it sends CTS. Options are no delay, 7 ms and 53 ms.

S2-4	S2-5	Setting
On	On	7 ms
Off	On	53 ms
On	Off	No delay
Off	Off	No delay

Switch S2-6 & S2-7: 2-Wire/4-Wire Mode Selection

The setting for switch S2-6 and S2-7 determines whether the Model 1065 Series is operating in 2-wire or 4-wire mode.

S2-6	S2-7	Setting
On	On	4-wire (half duplex)
On	Off	4-wire (full duplex)
Off	On	2-wire (half duplex)

Switch S2-8: V.54 Loopback Test Enable

This switch enables or disables V.54 looping functions on the 1065RC.

S2-8	Setting
Off	V.54 Normal Operation
On	V.54 Testing Disabled

3.4 CONFIGURATION SWITCH SET "S3"

The DIP switches on S3 set the antistream control, local loopback enable, remote loopback enable and receive (input) impedance levels for the Model 1065RC. The default settings are shown in the S3 summary table.

S3 SUMMARY TABLE

Position	Function	Factory Default
S3-1	Input Impedance	On } 200 Ohms
S3-2	Input Impedance	Off }
S3-3	Timing Mode	Off
S3-4	Topology	On Point to Point
S3-5	Local Loopback	Off Disabled
S3-6	Remote Loopback	Off Disabled
S3-7	Anti-stream Control	Off } Disabled
S3-8	Anti-stream Control	Off }

Figure 7: Configuration Summary of S2 Switch Settings

NOTE: There are options on the data rate settings for S3-3. Please go to Section 3.2 and refer to Figure 5 & Figure 5.1 for more information on the data rate settings.

S3-1: Input Impedance

The setting for switch S3-1, S3-2 determines the 1065RC's input impedance. This allows you to choose the optimum impedance setting for your application. In long distance applications the impedance of the cable must match the impedance of the load (or resistor) of the Model 1065RC. Thicker gauge cables requires a lower ohm setting, while a thinner gauge cable should receive a higher ohm setting. See Figure 5.1 for a more details on selecting a setting.

S3-1	S3-2	Setting
On	On	130 ohms
On	Off	200 ohms
Off	On	320 ohms
Off	Off	High impedance (minimum 2k ohms)

S3-1, S3-2 SELECTION TABLE FOR MODEL 1065RC

Gauge of Cable	Data Rates, kb/s							
	1.2	1.8	2.4	3.6	4.8	7.2	9.6	14.4
19AWG/.9mm	320	320	200	200	200	200	200	130
22AWG/.6mm	320	320	320	200	200	200	200	200
24AWG/.5mm	320	320	320	320	200	200	200	200
26AWG/.4mm	320	320	320	320	320	200	200	200

Figure 8: Selection Table for S3-1 & S3-2

S3-1, S3-2 SELECTION TABLE FOR MODEL 1065RC (Continued)

Gauge of Cable	Data Rates, kb/s						
	16	19.2	28.8	32	38.4	57.6	64
19AWG/.9mm	130	130	130	130	130	High	High
22AWG/.6mm	200	130	130	130	130	High	High
24AWG/.5mm	200	200	130	130	130	High	High
26AWG/.4mm	200	200	200	200	130	High	High

Figure 8.1: Selection table for S3-1 & S3-2 (continued)

S3-3: Timing Mode

Use Switch S3-3 to select the timing mode of the 1065RC. To operate the 1065RC at 16, 32, or 64kbps, set S3-3 to the On position. To select any other DTE rate, set Switch S3-3 Off.

S3-3	Setting
On	16, 32, or 64kbps
Off	1.2 - 5.7kpbs, excluding 16k and 32k

S3-4: Topology

Use switch S3-4 to select the toplogy of the Model 1065RC

S3-4	Setting
On	Point to point
On	Master multipoint
Off	Slave multipoint

S3-5: RS-232 Initiation of Local Loopback Test

The setting for switch S3-5 determines whether or not the Model 1065RC's local analog loopback test can be initiated by raising pin 18 on the RS-232 interface.

S3-5	Setting
On	RS-232 initiation enabled
Off	RS-232 initiation disabled

S3-6: RS-232 Initiation of Remote Loopback Test

The setting for switch S3-6 determines whether or not the Model 1065RC's remote digital loopback test can be initiated by raising pin 21 on the RS-232 interface.

S3-6	Setting
On	RS-232 initiation enabled
Off	RS-232 initiation disabled

S3-7 and S3-8: Antistream Control

Switches S3-7 and S3-8 are set in combination to determine the timeout period for the Model 1065RC's antistream control timer.

S3-7	S3-8	Setting
Off	Off	Disabled
Off	On	12.5 seconds
On	Off	50 seconds
On	On	12.5 seconds

3.5 REAR CARD CONFIGURATION

The Model 1065RC has two interface card options: DB-25/RJ-11 and DB-25/RJ-45. Each of these options supports one RS-232 connection and one 4-wire connection. Figure 8 illustrates the two different interface options for the Model 1065RC.

Prior to installation, you will need to examine the rear card you have selected and make sure it is properly configured for your application. Each rear card is configured by setting straps located on the PC board. Section 3.5.1 describes the strap locations and possible settings for each rear card.

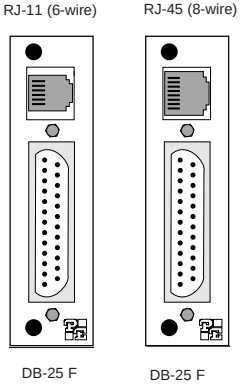


Figure 8. Model 1065RC interface card options

3.5.1 REAR CARD STRAP SETTINGS

Figure 9 shows strap locations for the Model 1000RMC12511 (DB-25/RJ-11) and the Model 1000RMC12545 (DB-25/RJ-45) rear cards. These straps determine various grounding characteristics for the RS-232 and twisted pair lines.

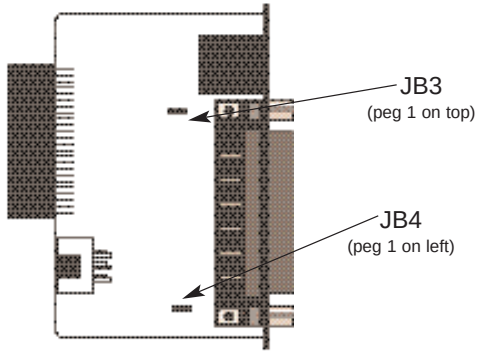


Figure 9. DB-25/RJ-11 & DB-25/RJ-45 strap locations

Figure 10 shows the orientation of the rear interface card straps. The strap can either be on pegs 1 and 2, or on pegs 2 and 3.

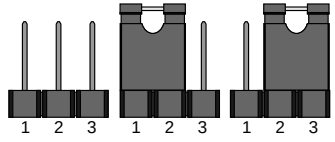


Figure 10. Orientation of interface card straps

Figure 11 below provides an overview of interface strap functions for the rear interface cards. Following this overview is a detailed description of each strap's function.

INTERFACE CARD STRAP SUMMARY TABLE #1			
Strap	**Function**	**Position 1&2**	**Position 2&3**
JB3	DTE Shield (Pin1) & FRGND	Connected	Open*
JB4	FRGND & SGND	Connected	Open*

Figure 11. Summary of strap settings, * indicates factory default

DTE Shield (Pin 1) & FRGND (JB3)

In the connected position, this strap links DB-25 pin 1 & frame ground. In the open position, pin 1 is “lifted” from frame ground.

JB3
Position 1&2 = DTE Shield (Pin 1) and FRGND Connected
Position 2&3 = DTE Shield (Pin 1) and FRGND Not Connected

SGND & FRGND (JB4)

In the connected position, this strap links DB-25 pin 7 (Signal Ground) and frame ground. In the open position, pin 1 is “lifted” from frame ground.

JB4
Position 1&2 = SGND (pin 7) and FRGND Connected
Position 2&3 = SGND (Pin 7) and FRGND Not Connected

4.0 INSTALLATION

This section describes the functions of the Model 1001R14P rack chassis, tells how to install front and rear Model 1065RC cards into the chassis, and provides diagrams for wiring the interface connections correctly.

4.1 THE MODEL 1001R14P RACK CHASSIS

The Model 1001R14P Rack Chassis (Figure 12) has sixteen short range modem card slots, plus its own power supply. Measuring only 3.5” high, the Model 1001R14P is designed to occupy only 2U in a 19” rack. Sturdy front handles allow the Model 1001R14P to be extracted and transported conveniently.

4.1.1 THE RACK POWER SUPPLY

The power supply included in the Model 1001R14P 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.

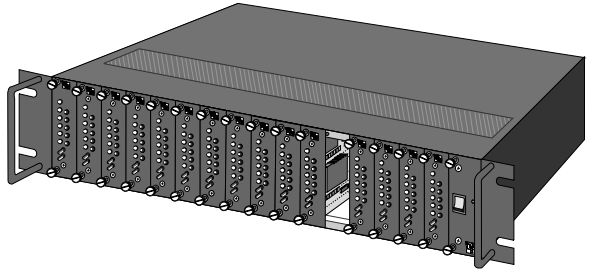


Figure 12. Model 1001R14P Rack Chassis with power supply

Switching the Power Supply On and Off

The power supply on/off switch is located on the front panel. When plugged in and switched on, a red front panel LED will glow. Since the Model 1001R14P 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. Be sure power is off before power module card is removed.

Replacing the Power Supply Fuse

The rack chassis power supply uses a 1.5A, 250V fuse. The fuse compartment is located just below the AC socket on the rear card. to replace the fuse, follow these three steps:

1. Using a small screw driver, 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. There are two fuses in the drawer. The front fuse is the spare and 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, which is located in 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***** from Patton Electronics. You may also choose to buy a replacement fuse from a nearby electronics store.

***WARNING: For continued protection agaisnt the risk of fire, replace only with the same type and rating of fuse.**

4.2 INSTALLING THE MODEL 1065RC INTO THE CHASSIS

The Model 1065RC is comprised of a front card and a rear card. The two cards meet inside the rack chassis and plug into each other by way of mating 50 pin card edge connectors. Use the following steps as a guideline for installing each Model 1065RC into the rack chassis:

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

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

3. Slide the 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 1001R14P chassis allows "hot swapping" of cards, it is *NOT NECESSARY TO POWER DOWN* the rack when you install or remove a Model 1065RC.

4.3 WIRING THE MODEL 1065RC

Each of the rear interface cards compatible with the Model 1065RC has one RS-232 port and one 4-wire (twisted pair) port. These cards provide a female DB-25 for RS-232 connection.

4.3.1 RS-232 CONNECTION

The Model 1065RC uses a DB-25 female to connect the RS-232 interface to your computing hardware. It is pinned according to the RS-232C/V.24 interface standard. For specific interface pin-outs, please refer to the diagrams in Appendix D of this manual.

The Model 1065RC is wired to connect to a DTE. If your RS-232 output device is a DTE, use a *straight though cable* to connect to the Model 1065RC. If your RS-232 output device is DCE, call Technical Support at (301) 975-1007 for specific installation instructions.

4.3.2 TWISTED PAIR CONNECTION

The Model 1065RC operates over one or two twisted pair. In *all* applications, the twisted pair wire must be 26 AWG or thicker, unconditioned, dry, metallic wire. Both shielded and unshielded wire yield favorable results. **Note:** The Model 1065RC communicates in a closed data circuit with another Model 1065RC or other compatible modem. Dial-up analog circuits, such as those used with a standard Hayes-type modem, are *not acceptable.* For further information about acceptable wire grades, please refer to the diagrams in Appendix B.

Point-to-Point Twisted Pair Connection

The 6-position RJ-11 and 8-position RJ-45 jack options for the Model 1065RC are prewired for a standard TELCO wiring environment. Connection of a 4-wire twisted pair circuit between two or more Model 1065RCs requires a *crossover cable* as shown in the following diagrams.

RJ-11/4-Wire

SIGNAL	PIN#	COLOR	COLOR	PIN#	SIGNAL
GND†	1	Blue‡	White	6	GND
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	Blue	1	GND

RJ-45/4-Wire

SIGNAL	PIN#	COLOR	COLOR	PIN#	SIGNAL
GND†	2	Orange‡	Brown	7	GND
RCV-	3	Black	Green	5	XMT-
XMT+	4	Red	Yellow	6	RCV+
XMT-	5	Green	Black	3	RCV-
RCV+	6	Yellow	Red	4	XMT+
GND	7	Brown	Orange	2	GND

†Connection to ground is optional
‡Standard color codes—yours may be different

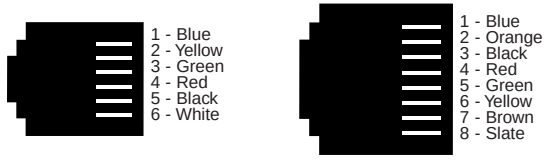
RJ-11/2-Wire

SIGNAL	PIN#	COLOR	COLOR	PIN#	SIGNAL
XMT+ˈ	3	Green‡	Green	3	XMT+
XMT-	4	Red	Red	4	XMT-

RJ-45/2-Wire

SIGNAL	PIN#	COLOR	COLOR	PIN#	SIGNAL
XMT+ˈ	4	Red‡	Red	4	XMT+
XMT-	5	Green	Green	5	XMT-

‡Standard color codes—yours may be different
ˈThe Model 1065RC is not sensitive to polarity



AT&T standard modular color codes

4.3.3 Multipoint Twisted Pair Connection

The Model 1065RC supports multipoint applications using a star topology. Maximum distance between the units will vary based upon the number of drops, data rate, wire gauge, etc. Call Patton Technical Support for specific distance estimates. Figures 11 and 12 show how to wire the one-pair and two-pair cables properly for a Model 1065RC star topology. Note that the ground connection is not needed.

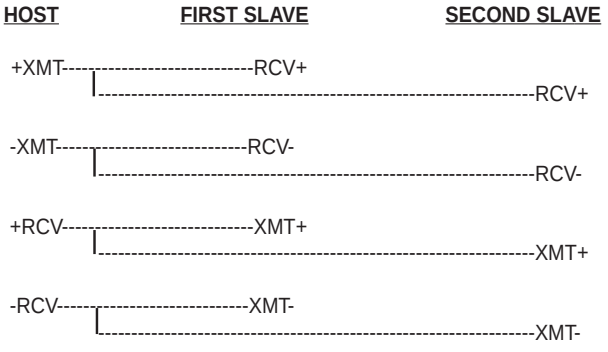


Figure 13. Two-pair star wiring for Model 1065RC host and slaves

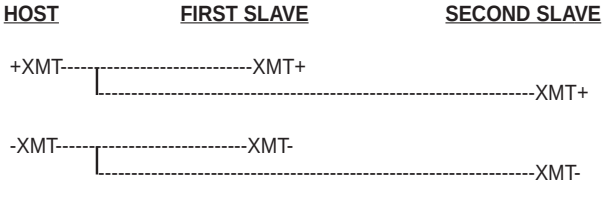


Figure 14. Single-pair star wiring for Model 1065RC host and slaves

5.0 OPERATION

Once you have configured each Model 1065RC properly and connected the twisted pair and RS-232 cables (see Section 4.0), you are ready to operate the units. This section describes reading the LED status monitors, powering-up and using the built-in V.52 and V.54 test modes.

5.1 LED STATUS MONITORS

The Model 1065RC features six front panel status LEDs that indicate the condition of the modem and communication link. Figure 15 shows the front panel location of each LED. Following Figure 15 is a description of each LED's function.

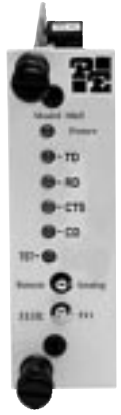


Figure 15: The Model 1065RC front panel, showing LEDs and switches

5.1.1 The “TD” and “RD” Indicators

The “TD” and “RD” indicators blink green with data activity. Off indicates a low RS-232 logic level, green indicates a high RS-232 logic level. Note: RS-232 devices idle in a *low* state, so the LED will be off if the connections are correct and the RS-232 device is in an idle state.

5.1.2 The “RTS” and “CD” Indicators

The “RTS” and “CD” indicators will be off for a “low” signal or green for a “high” signal. RTS lights for an incoming signal on RS-232 pin 4. CD lights for an incoming signal on the line side, and the resulting output signal on RS-232 pin 8.

5.1.3 The "Test" Indicator

The green "Test" LED indicates that V.52 or V.54 tests are running.

5.1.4 The "Error" Indicators

The "Error" indicator LED has two functions:

A. When the 1065RC is in test mode (green "Test" LED is lit), the error LED glows red when bit errors occur.

B. When not in test mode (green "Test" LED is off), the error LED is used to indicate an RTS streaming condition. (See Section 5.2) for information on the antistreaming circuitry.

5.2 ANTI-STREAMING ERROR INDICATOR

When not in test mode (green "Test" LED is off), the front panel "Error" LED is used to indicate a streaming error. When the Model 1065RC's antistreaming circuitry is enabled, the RTS signal from the DTE is timer controlled. The timer begins to count when the DTE raises RTS. If the time period that RTS remains high exceeds the preset timeout period, the antistream circuit will force RTS low. The "Error" LED will light red, indicating a streaming condition (RTS continually on). This feature prevents a malfunctioning terminal from tying-up a computer port in a multidrop or polling environment. When the DTE drops RTS, the antistreaming timer is automatically reset and the front panel "Error" LED turns off. The timeout period is DIP switch selectable for 12.5 or 50 seconds.

5.3 POWER-UP

There is no power switch on the Model 1065RC: Power is automatically applied to the Model 1065RC when its card-edge connector makes contact with the chassis' mid-plane socket, or when the chassis' power supply is turned on. *Note: The Model 1065RC is a "hot swappable" card—it will not be damaged by plugging it in or removing it while the rack is powered up.*

When the local and remote Model 1065RCs are *both* powered up and are passing data *normally*, the following LED conditions will exist:

- PWR = green
- TD & RD = flashing off and on (green)
- RTS & CD = green
- TEST = off

5.4 TEST MODES

The Model 1065RC offers two V.54 test modes and two V.52 test modes to evaluate the condition of the modems and the communication link. Both sets of tests can be activated physically from the front panel. The V.54 test can also be activated from the RS-232 interface. *Note: V.54 and V.52 test modes on the Model 1065RC are available for point-to-point applications only.*

5.4.1 LOCAL ANALOG LOOPBACK (LAL)

The Local Analog Loopback (LAL) test checks the operation of the local Model 1065RC, and is *performed separately on each unit.* Any DTE data sent to the local Model 1065RC in this test mode will be echoed (returned) back to the user device. For example, characters typed on the keyboard of a terminal will appear on the terminal screen. To perform a LAL test, follow these steps:

1. Activate LAL. This may be done in one of two ways: by moving the upper front panel toggle switch RIGHT to "Analog" or by raising pin 18 on the RS-232 interface (note: be sure DIP switch S3-5 is enabled). Once LAL is activated, the Model 1065RC transmit output is connected to its own receiver. The "Test" LED should be lit.

2. Verify that the data terminal equipment is operating properly and can be used for a test.

3. Locate the lower of the two toggle switches on the front panel of the Model 1065RC and move it to the right. This will activate the V.52 BER test mode and inject a "511" test pattern into the local loop. If any errors are present in the loop, the red "Error" LED will blink sporadically.

4. If the BER test indicates *no errors* are present, move the V.52 toggle switch to the left, thus activating the "511/E" test with periodic errors. If the test is working properly, the red "Error" LED will blink *regularly*. A successful "511/E" test will confirm that the loop is in place, and that the Model 1065RC's built-in "511" generator and detector are working properly.

5. If the BER test indicates that errors *are* present, check to see that the RS-232 cable connecting the DTE to the Model 1065RC is wired straight through, and is plugged in properly. Also, ensure that the Model 1065RC is configured properly. Then re-check your DTE equipment. If you still have errors, call **Patton Technical Support at (301) 975-1007.**

5.4.2 REMOTE DIGITAL LOOPBACK (RDL)

The Remote Digital Loopback (RDL) test checks the performance of both the local and remote Model 1065RCs, *and* the communication link between them. Any characters sent to the remote 1065RC in this test mode will be returned back to the originating device. For example, characters typed on the keyboard of the local terminal will appear on the local terminal screen *after* having been passed to the remote Model 1065RC and looped back. To perform an RDL test, follow these steps:

1. Activate RDL. This may be done in two ways: by moving the upper front panel toggle switch LEFT to “Remote” or by raising pin 21 on the RS-232 interface.

2. Verify that the DTE equipment on the local end is operating properly and can be used for a test.

3. Locate the lower of the two toggle switches on the front panel of the 1065RC and move it to the right. This will activate the V.52 BER test mode and inject a “511” test pattern into the remote loop. If any errors are present in the loop, the red “Error” LED will blink sporadically.

4. If the BER test indicates *no errors* are present, move the V.52 toggle switch to the left, thus activating the “511/E” test with periodic errors. If the test is working properly, the red “Error” LED will blink *regularly*. A successful “511/E” test will confirm that the loop is in place, and that the Model 1065RC’s built-in “511” generator and detector are working properly.

5. If the remote BER test indicates that errors *are* present, and the local analog loopback/BER tests showed that both Model 1065RCs were functioning properly, this suggests a problem with the twisted pair communication line connecting the two modems. A common problem is improper crossing of the pairs. Also, verify that the modular connections are pinned properly, and the twisted pair line has continuity. If you still have errors, call **Technical Support at (301) 975-1007.**

5.4.3 USING THE V.52 BER TEST INDEPENDENTLY

The Model 1065RC's V.52 BER test can be used independent of the V.54 loopback tests. This requires two operators: one to initiate and monitor the test at both the local and the remote Model 1065RC. To use the V.52 BER test by itself, both operators should simultaneously follow these steps:

1. Locate the lower of the two toggle switches on the front panel of the Model 1065RC and move it to the right. This will activate the V.52 BER test mode and transmit a “511” test pattern to the other unit. If any errors are present, the receiving modem’s red “Error” LED will blink sporadically. Note: For this independent test to function, the “511” switch on *both* Model 1065RCs must be turned on.

2. If the test indicates no errors are present, move the V.52 toggle switch to the left, thus activating the “511/E” test with periodic errors present. If the test is working properly, the receiving modem’s red “Error” LED will blink *regularly*. A successful “511/E” test will confirm that the link is in place, and that the Model 1065RC’s built-in “511” generator and detector are working properly.

APPENDIX A

PATTON ELECTRONICS MODEL 1065RC SPECIFICATIONS

Transmission Format: Synchronous or asynchronous, 2-wire/half duplex, or 4-wire/full or half duplex

Internal Interface: Connection to Model 1001R14P rack chassis via 50 pin male card edge

External Interface: DB-25 female; RJ-11 or RJ-45

Transmission Line: 2 or 4-wire UTP, 19 - 26 AWG

Data Rates: Synchronous or asynchronous at 1.2, 1.8, 2.4, 3.6, 4.8, 7.2, 9.6, 14.4, 19.2, 28.8, 38.4, 57.6 and 64.0 kbps—switch selected

Clocking: Internal, external or receive recover

Controls: Carrier constantly “ON” or “controlled by RTS”; RTS/CTS delay set to no delay, 7 or 53 ms

Applications: Point-to-point or multi-point

Indicators: Mono-color LED indicators for TD, RD, RTS & CD; single LED indicators for Test and Error

Diagnostics: V.52 compliant bit error rate pattern; V.54 compliant— Local Analog Loopback and Remote Digital Loopback, activated by front panel switch or via RS-232 interface

Transformer Isolation: 2000 V RMS

Surge Protection: Silicon Avalanche Diodes

Temperature: -10°C to +70°C

Humidity: 0-85%, non-condensing, from 10°C to +30°C

Dimensions: 0.95”w x 3.1”h x 5.4”l

APPENDIX B

PATTON ELECTRONICS MODEL 1065RC CABLE RECOMMENDATIONS

All Patton Electronics Company Short Range Modems are tested to the distances published in our Catalogs and Specification Sheets on twisted-pair cable with the following characteristics:

Wire Gauge	Capacitance	Resistance
19 AWG	83nF/mi or 15.72 pF/ft.	.0163 /ft.
22 AWG	83nF/mi or 15.72 pF/ft.	.0326 /ft.
24 AWG	83nF/mi or 15.72 pF/ft.	.05165 /ft.
26 AWG	83nF/mi or 15.72 pF/ft.	.08235 /ft.

We fully expect that the Short Range Modems will operate on lines with specifications different from those tested, but to reduce the potential difficulties in the field, one should ensure that the cable being used has similar or better characteristics (lower capacitance or lower resistance).

Model 1065RC Distance Table - Miles (KM)			
Data Rate (kbps)	Wire Gauge (AWG/mm)		
	22 (.6mm)	24 (.5mm)	26 (.4mm)
1.2	11.9 (19.2)	9.8 (15.8)	7.2 (11.6)
1.8	11.6 (18.6)	8.7 (14.0)	7.0 (11.3)
2.4	11.1 (18.0)	8.0 (12.8)	6.6 (10.7)
3.6	10.4 (16.8)	7.6 (12.2)	6.25 (10.1)
4.8	9.7 (15.5)	6.9 (11.1)	5.9 (9.4)
7.2	9.1 (14.6)	6.6 (10.7)	4.9 (7.9)
9.6	7.6 (12.2)	6.25 (10.1)	4.5 (7.3)
14.4	7.4 (11.9)	5.2 (8.4)	4.0 (6.4)
16	7.2 (11.6)	5.1 (8.2)	3.8 (6.1)
19.2	6.8 (11.0)	4.9 (7.9)	3.6 (5.8)
28.8	6.0 (9.6)	3.8 (6.1)	3.0 (4.9)
32	5.7 (9.1)	3.6 (5.8)	2.8 (4.6)
38.4	4.7 (7.6)	3.2 (5.2)	2.2 (3.7)
57.6	3.4 (5.5)	2.7 (4.3)	1.9 (3.0)
64	2.5 (4.0)	2.3 (3.7)	1.3 (2.1)

Wire with capacitance of 20pF/ft. or less is suitable for all our Short Range Modems however, distances may vary from those published in our catalog. Resistance will also affect distance but not functionality. Wire should be 26 AWG or larger (smaller AWG#).

Patton products are designed to withstand normal environmental noise and conditions however, other environmental factors too numerous to discuss in this format may affect proper operation of the SRM's.

Selection of the proper SRM for an application is critical to maintaining Customer Satisfaction and should be taken seriously. Certain models are better suited for particular applications and environments than others.

APPENDIX C

PATTON ELECTRONICS MODEL 1065RC
FACTORY REPLACEMENT PARTS

DIRECTION	STANDARD RS-232C/V.24 "DCE" SETTING	DIRECTION
	1- (FG) Frame Ground	
From 1065RC	Transmit Clock - 15	2- (TD) Transmit Data — To 1065RC
		3- (RD) Receive Data — From 1065RC
From 1065RC	Receive Clock - 17	4- (RTS) Request to Send — To 1065RC
To 1065RC	Analog Loop - 18	5- (CTS) Clear to Send — From 1065RC
		6- (DSR) Data Set Ready — From 1065RC
		7- (SG) Signal Ground
To 1065RC	Data Term. Ready (DTR) - 20	8- (DCD) Data Carrier Detect — From 1065RC
To 1065RC	Digital Loop - 21	
To 1065RC	External Clock - 24	
From 1065RC	Test Mode - 25	

The Patton Model 1065RC rack system features interchangeable rear 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
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