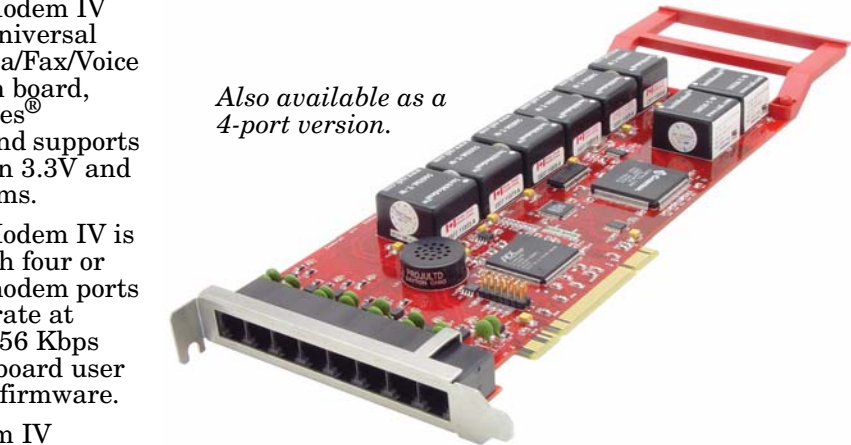# Hardware Installation and Specifications

The RocketModem IV family is a Universal PCI V.92 Data/Fax/Voice multi-modem board, which is Hayes® compatible and supports installation in 3.3V and 5V bus systems.

Also available as a 4-port version.

The RocketModem IV is available with four or eight RJ11 modem ports that can operate at speeds up to 56 Kbps and uses on-board user upgradeable firmware.
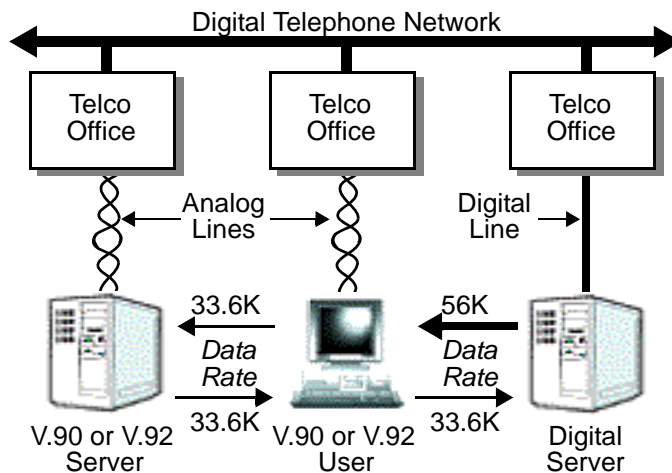
RocketModem IV features include:

- Ring Indicator (RI) status is included on all modem ports
- Individual software controlled modem reset capability
- Speaker

All V.92 modems are analog line devices. The following figure shows when you can and cannot achieve 56 Kbps.

- V.92 modems can *receive* data at rates up to 56 Kbps, provided the data is being transmitted by a digital modem on a digital (e.g., T1 or ISDN) line.
- V.92 modems can *send* data over analog (twisted pair) phone lines at a maximum rate of 33.6 Kbps—even if communicating with other V.92 modems.
- The actual data rate achieved depends on the age and condition of the analog phone lines, and may be lower than 33.6 Kbps.

Before Installing the Hardware

You should locate and unpackage the driver for your operating system before installing the hardware. You may want to also review or print the software installation and configuration document for the operating system.

	Device Driver†, Applications, and Documentation	Download from Web
Documents and Applications	*RocketModem IV Hardware Installation and Specifications*	
	AT Command Set for RocketModem IV	
	RocketModem Diagnostic **Note:** *For information about creating a bootable diagnostic diskette, see* <u>*Using the Diagnostics*</u> *on Page 11.*	
Linux	Device Driver	
	Installation Guide†	
Windows 2000, Windows XP, and Windows Server 2003	Device Driver	
	Installation Guide for **Windows 2000**†	
	Installation Guide for **Windows XP and Windows Server 2003**†	
	RRAS Configuration Overview: **Windows XP**	
	Comtrol Utilities (Test Terminal, Port Monitor, and PEER Tracer)	
Windows NT	Device Driver (Comtrol Utilities included)	
	Installation Guide for Windows NT†	

† *The documentation does not mention RocketModem IV. Use the RocketModem configuration information for RocketModem IV.*

Installing the RocketModem IV

Use the following procedures to install a single RocketModem IV.

Note: *Make sure that you install new adapters one at a time to minimize installation problems.*

European Installations: Before Hardware Installation

Caution

Before installing this board, ensure that the power drawn by this board, together with the host and any auxiliary boards drawing power from the host, is within the rating of the host power supply. Equipment must be installed such that, with the exception of connections to the host, the clearance and creepage distances shown in the following table are maintained between the board and other assemblies that use or generate the voltages shown in the table. The larger distances shown in (brackets) apply where the local environment within the host is subject to conductive pollution or dry non-conductive pollution which could become conductive due to condensation (Pollution Degree 3 environments). Failure to maintain these minimum distances would invalidate the approval.

Note: *Obtain advice from a telecommunications safety engineer for a host or other expansion boards fitted in the host using or generating voltages greater than 300 V (rms or dc).*

Minimum Clearance	Creepage	Voltage
2.0 mm	2.4 (3.8) mm	Up to 50 Vrms or Vdc
2.6 mm	3.0 (4.8) mm	Up to 125 Vrms or Vdc
4.0 mm	5.0 (8.0) mm	Up to 250 Vrms or Vdc
4.0 mm	6.4 (10.0) mm	Up to 300 Vrms or Vdc

Safety Notices

Installation of inside wire may bring you close to electrical wire, conduit, terminals and other electrical facilities. Extreme caution must be used to avoid electrical shock from such facilities. Avoid contact with electrical current by following these guidelines:

• Use tools with insulated handles.

• Do not place telephone wiring or connections in any conduit, outlet or junction box containing electrical wiring.

Note: *Do not work on your telephone wiring at all if you wear a pacemaker. Telephone lines carry electrical current.*

• Telephone wiring must be at least 6 feet from bare power wiring or lightning rods and associated wires, and at least 6 inches from other wire (antenna wires, doorbell wires, wires from transformers to neon signs), steam or hot water pipes, and heating ducts.

• Before working with existing inside wiring, check all electrical outlets for a square telephone dial light transformer and unplug it from the electrical outlet. Failure to unplug all telephone transformers can cause electrical shock.

• Do not place a jack where it would allow a person to use the telephone while in a bathtub, shower, swimming pool, or similar hazardous location.

• Protectors and grounding wire placed by the service provider must not be connected to, removed, or modified by the customer.

Caution

Do not touch telephone wiring during lightning!

Installing the Hardware

Use this procedure to install the RocketModem IV.

1. Extract the appropriate driver for your operating system and if desired, print the installation document. See *Before Installing the Hardware* on Page 2, if you need the driver and documentation.

   The device driver is available on the Comtrol CD shipped with the product or can be located by using *Locating Software and User Guides* on Page 5.

   You can insert the Comtrol CD, double-click on the driver, and extract the files to your host system a new subdirectory, for example: **\Comtrol**.

2. Review the information discussed in *Safety Notices* on Page 3 and *FCC Notices* on Page 13.

3. Turn your computer off and remove the system unit cover.

   Note: For best results we recommend installing RocketModem IV boards one at a time, to simplify the configuration process.

4. Select an available PCI slot and remove the slot cover.

5. Insert the RocketModem IV in the expansion slot making sure that it is seated securely.

   Note: The RocketModem IV is a full length card. Do not remove the support bracket during installation. Deformation of the card due to bracket removal is not covered by the warranty.

6. Re-install the expansion slot cover screw.

   Note: When powered up, the RocketModem IV generates significant heat. After you install and configure the RocketModem IV, make sure the system cover is closed and the ventilation fan is unobstructed. If you install more than one RocketModem IV, you may want to add an additional internal cooling fan.

7. Connect standard RJ11 (telephone) cables between the RocketModem IV ports and the phone line jacks. See *Modem Cables* on Page 16 if you need information about the RJ11 pinouts.

   The modem ports on the RocketModem IV mounting bracket are numbered as shown in the illustration at right. The port on the "top" edge of the board is modem Line 1, and the port at the "bottom" edge of the board, nearest the bus connector, is Line 8.

8. Power up the computer, and install and configure the device driver for your operating system using the software installation and configuration document for your operating system (*Before Installing the Hardware* on Page 2).

After you have successfully installed one RocketModem IV, you can install additional RocketModem IV boards by repeating this process.
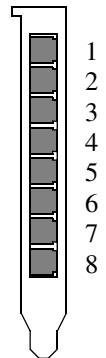
Using RocketModem IV Features

The following subsections discuss using the speaker, Caller ID, Voice mode, and Low Power Sleep mode.

Note: *See the software installation document (<u>Before Installing the Hardware</u> on Page 2) for your operating system to reset a modem ports.*

Using the Speaker

The RocketModem IV includes a speaker, which enables you to listen to the call in progress and helps you determine the state of the phone line and the modem. This speaker is shared by all modems on the board and can be controlled for individual modems by use of AT commands.

The following table lists some of the more commonly used speaker-related AT commands. For a complete list, see the *Conexant AT Commands for CX81801 SmartV.XX, CX06833 SMXXD, CX81300 SmartACF, and CX06827 SCXXD Modems Reference Manual*, Doc. No. 102184B: July 1, 2003.

AT Command	Usage
L	**ATL**(0, 1, 2, 3). Enter the **ATL***n* command to set the modem speaker volume, where 0 is the lowest level and 3 is the highest level. This value is written to **S22** bits 0 and 1.
M	**ATM**(0, 1, 2, 3). Enter the **ATM***n* command to set the modem speaker mode. This value is written to **S22** bits 2 and 3. Valid values are: • **M0** - Speaker always off • **M1** - Speaker on when making call but off when receiving carrier • **M2** - Speaker always on • **M3** - Speaker off when making call but on when answering
&V	Enter **AT&V** to display the contents of the **S**-Registers and check the state of the **L** and **M** registers.

Using Caller ID

The RocketModem IV supports the use of Caller ID services through use of the **+VCID** and **+VRID** commands.

The following page numbers are referenced from the *Conexant AT Commands Reference Manual*.

• To enable formatted caller ID, use **at+vcid=1**.

  For detailed information, see Section 3.2.1: *Generic Modem Control: +VCID Caller ID (CID)* on Page 3-3.

• To enable formatted retrieval of the last caller information, use **at+vrid=0**.

  For detailed information, see Section 3.2.1: *Generic Modem Control: +VRID Report Retrieved Caller ID (CID)* on Page 3-4.

Additional information for these commands, see Table 6-1: *Voice Commands* on Page 5-1 and Table 6-6: *Events Detectable in the Voice Mode per V.253*. Page 5-13.

Using Voice Mode

After being put into voice mode, characters entered from the telephone set are passed on to the application. Enable voice mode using this command: **at+fclass=8.**

**Using Low Power
Sleep Mode**

The RocketModem IV supports the use of low power sleep mode through use of the **S24** parameter. The following page numbers are referenced from the *Conexant AT Commands Reference Manual*.

- Table 3-15 (*S-Parameter Summary*) and Page 3-105 (Acrobat/131) provides an overview
- The *S24 - Sleep Inactivity Timer* subsection provides detailed information on Page 3-113 (Acrobat/139)

Basic AT Commands

This section will list the basic commands required for most applications. Some commands have parameters associated with them. The format is as follows: ATXn<CR> where "n" equals the parameter, usually 0 or 1. The list below reflects the more common commands used for data connections.

AT Commands

A/	Repeat previous command
A	Answer

B*n*	Select CCITT or Bell standard
B0	CCITT operation at 300 or 1200 bps
B1	Bell operation at 300 or 1200 bps (default)

D	Dial
0–9	Dial DTMF digits 0 to 9
A–D	Dial DTMF digits A, B, C, and D
P	Select pulse dialing; affects current and subsequent dialing.
T	Select tone dialing; affects current and subsequent dialing.
!	Flash: go on-hook for a time defined by S29.
W	The modem will **W**ait for dial tone before dialing the next number. If no dial tone is detected within the time specified by S7, the modem aborts the rest of the sequence, goes on-hook, and generates an error message.
@	Wait for 5 seconds of silence before proceeding with next dialing string and then complete handshake sequence.
,	Pause. The modem pauses for a time specified by S8 before dialing the following digits. Most often used when dialing an outside line through a PBX.
;	Return to command mode after processing command
^	Disable calling tone transmission; applicable to current dial attempt only

A typical example of the Dial command is: ATDT767-8900 <CR>

Meaning "**AT**tention **D**ial using **T**ouch-tone the numbers 7678900

E*n*	Command echo
E0	Disables command echo.
E1	Enables command echo (default)

H*n*   Disconnect (hang up)

    H0   Hang up (default).

    H1   Go off-hook

I*n*   Modem Identification

    I0   Reports product code (either 33600 or 56000).

    I1   Reports 255 if the pre-stored checksum value is FFh

    I2   Reports OK (for software compatibility).

    I3   Reports the Firmware version of modem

                 Example: 3.xxx-V90_2M_DLS

L*n*   Speaker volume

    L0   Off or low volume

    L1   Low volume (default)

    L2   Medium volume

    L3   High volume

M*n*   Speaker control

    M0   Speaker is always off.

    M1   Speaker is on during call establishment, but goes off when carrier is detected (default).

    M2   Speaker is always on.

    M3   Speaker is off during dialing and when receiving carrier, but on during answering.

Q*n*   Quiet results codes control

    Q0   Enables result codes to the DTE (default).

    Q1   Disables result codes to the DTE.

S*r*   Read or write to S-register "r"

    r   Establishes S-register "r" as the default register.

    r= n   Sets S-register "r" to the value "n"

    r?   Reports the value of S-register "r".

V*n*   Result code form

    V0   Enables short-form (terse) result codes.

    V1   Enables long-form (verbose) result codes (default).

W*n*   Error correction message control

    W0   Upon connection, the modem reports only the DTE speed (e.g., CONNECT 9600). Subsequent responses are disabled (default).

    W1   Upon connection, the modem reports the line speed, the error correction protocol, and the DTE speed. Subsequent responses are disabled.

    W2   Upon connection, the modem reports DCE speed (e.g., CONNECT 2400). Subsequent responses are disabled.

X*n*   Extended Result Codes

     X0   Ignores dial & busy tone. Sends CONNECT message when a connection is established by blind dialing.

     X1   Disables monitoring of busy tones; sends only OK, CONNECT, RING, NO CARRIER, ERROR. If busy tone detection is enforced and busy tone is detected, NO CARRIER will be reported instead of BUSY. If dial tone detection is enforced or selected and dial tone is not detected, NO CARRIER will be reported instead of NO DIALTONE.

     X2   Disables monitoring of busy tones. Sends only OK, CONNECT, RING, NO CARRIER, ERROR, NO DIALTONE, and CONNECT XXXX. If busy tone detection is enforced and busy tone is detected, NO CARRIER will be reported instead of BUSY. If dial tone detection is enforced or selected and dial tone is not detected, NO CARRIER will be reported instead of NO DIALTONE.

     X3   Enables monitoring of busy tones; sends only OK, CONNECT, RING, NO CARRIER, ERROR, NO DIALTONE, and CONNECT or CARRIER XXXX. If dial tone detection is enforced and dial tone is not detected, NO CARRIER will be reported.

     X4   Enables monitoring of busy tones; sends all messages. (Default.)

Z*n*   Soft reset

     Z0   Soft reset

AT& Commands   **&C*n***   Data Carrier Detect (DCD) option

     &C0   DCD remains ON at all times.

     &C1   DCD follows the state of the carrier (default).

&D*n*   DTR (Data Terminal Ready) Option

     &D0   Ignores DTR.

     &D1   Enter the escape mode when ON-to-OFF transition is detected on DTR.

     &D2   Hangs up, assumes command state and disable auto-answer upon detecting ON-to-OFF transition of DTR (default).

     &D3   ON to OFF transition causes the modem to perform a soft reset. It is the same as if an ATZ command is issued.

&F*n*   Restore factory configuration (profile)

&G*n*   Select guard tone

     &G0   Disables guard tone (default).

     &G1   Enables 550-Hz guard tone.

     &G2   Enables 1800-Hz guard tone.

&K*n*   Flow control

     &K0   Disables flow control.

     &K3   Enables RTS/CTS flow control (default for data modes).

     &K4   Enables XON/XOFF flow control

     &K5   Supports transparent XON/XOFF flow control.

&P*n* Select pulse dial make/break ratio

    &P0 39/61 make/break ratio at 10 pulses per second (default)

    &P1 33/67 make/break ratio at 10 pulses per second

    &P2 39/61 make/break ratio at 20 pulses per second

    &P3 33/67 make/break ratio at 20 pulses per second

&Q*n* Select Operation Mode

    &Q0 Selects direct asynchronous operation

    &Q5 The modem will try an error corrected link (default)

    &Q6 Selects asynchronous operation in normal mode (allows speed buffering and flow control but no error correction).

&S*n* DSR override

    &S0 DSR remains ON at all times (default).

    &S1 DSR becomes active after answer tone has been detected and inactive after carrier has been lost.

&W*n* Save current configuration – Will save DTE speed, parity settings, AT commands, and S Registers.

    &W0 Save the current configuration to stored profile 0

    &W1 Save the current configuration to stored profile 1

&V Display modems current configuration. When this command is entered, the   modem will display its current command and register settings.

AT% Commands **%C***n* Enables or disables data compression

    %C0 Disables data compression

    %C1 Enables MNP 5 data compression negotiation.

    %C2 Enables V.42 bis data compression (Sets S46 bit 1)

    %C3 Enables V.42 bis and MNP 5 data compression (default.)

%E*n* Line quality monitor

    %E0 Disable line quality monitor and auto-retrain

    %E1 Enable line quality monitor and auto-retrain

    %E2 Enable line quality monitor and fallback/fall-forward (default)

%L Line signal level

Returns a value that indicates the received signal level. For example, 009 = –9 dBm, 043 = –43 dBm, and so on.

%Q Line signal quality

Reports line signal quality (DAA-dependent). Returns higher order byte of the EQM value. Based on EQM value, retrain or fallback/fall-forward may be initiated if enabled by %E1 or %E2**.**

AT+MS Select / Force Modulation – This command is useful if you require to limit the modem to specific modulations or line speeds. This extended format controls the manner of operation of the modulation capabilities in the modem. It accepts six sub-parameters. Syntax AT+MS=

<carrier>,<automode>,<min_tx_rate>,<max_tx_rate>,<min_rx_rate>,<max_rx_rate>

To read the current settings enter: AT+MS?<CR>

A typical response would be: +MS: V90,1,300,33600,300,56000

Meaning: <V90> V.90 modulation, <1> Automode enabled, <300> min_tx_rate, <33600> max_tx_rate, <300> min_rx_rate, <56000> max_rx_rate.

+MS Command Supported Rates

Modulation	Carrier	Possible Minimum, Maximum, Receive and Transmit Rates
Bell 103	B103	300
Bell 212	B212	1200
V.21	V21	300
V.22	V22	1200
V.22bis	V22B	2400 or 1200
V.23	V23C	1200rx /75tx or 75rx/1200tx
V.32	V32	9600 or 4800
V.32bis	V32B	14400, 12000, 9600, 7200, or 4800
V.34	V34	33600, 31200, 28800, 26400, 19200, 16800, 14400, 12000, 9600, 7200, 4800, or 2400
V.90	V90	56000, 54667, 53333, 52000, 50667, 49333, 48000, 46667, 45333, 42667, 41333, 40000, 38667, 37333, 36000, 34667, 33333, 32000, 30667, 29333, 28000
V.92 downstream	V92	56000, 54667, 53333, 52000, 50667, 49333, 48000, 46667, 45333, 44000, 42667, 41333, 40000, 38667, 37333, 36000, 34667, 33333, 32000, 30667, 29333, 28000
V92 upstream	V92	48000, 46667, 45333, 44000, 42667, 41333, 40000, 38667, 37333, 36000, 34667, 33333, 32000, 30667, 29333, 28000, 26667, 25333, 24000

<Auto-mode> option parameters

0=Auto-mode disabled – Fixed Modulation

1=Auto-mode enabled – Automatically selected speed and modulation (default).

-STE=n - Set Telephone Extension Option – This command enables / disables "Line-In-Use" and "Extension Pickup" options.

-STE=n Value	Extension Pickup	Line-In-Use
0 (default)	Disabled	Disabled
1	Disabled	Enabled
2	Enabled	Disabled
3	Enabled	Enabled

If the line is in use and the modem issues an "ATDT" command to dial out, the modem will not go off hook and will display "LINE-IN-USE" result code. If the modem is off hook and the Extension is picked up, the modem will drop the connection.

AT S Registers

This section lists the basic AT Command Set S registers. The S registers use the following format: *ATSr=n<CR>* where "r" is the S register number and "n" is the value or parameter to set it to. To read the current contents of an S Register, issue *ATSr?<CR>* where "r" is the register in question. The modem will then display the value of the S Register.

Register	Range	Units	Default	Description
S0	0-255	Rings	0	Ring to answer on - ATS0=1<CR> means answer call on 1st ring detected
S1	0-255	Rings	0	Number of rings counted
S2	0-127	ASCII	43	Escape Code Character
S3	0-127	ASCII	13	Command terminator (Carriage Return Character or the Enter Key)
S4	0-127	ASCII	10	Line feed character
S5	0-127	ASCII	8	Back space character
S6	2-255	Seconds	2	Wait time for dial tone detection
S7	1-255	Seconds	50	Wait time for carrier
S8	0-255	Seconds	2	Pause time for coma in dial string
S10	1-255	.1sec	14	Loss of carrier to hang up delay
S11	50-255	.01sec.	95	DTMF tone duration
S12	0-127	1/50sec.	50	Escape Code Guard Time
S24*	0-255	1sec	0	Sleep Mode Inactivity Timer
S29	0-255	10mS	70	Hook flash dial modifier time (!)
S30	0-255	10sec.	0	Inactivity disconnect timer
S95			0	Result code control

*Note: **Sleep Mode Operation** – S24 sets the length of time, in seconds, that the modem will operate in normal mode with no detected telephone line or DTE line activity before entering low power sleep mode. The timer is reset upon any DTE or telephone line activity. If S24 is set to zero, the modem will never enter the low power sleep mode.*

Using the Diagnostics

The diagnostic file and an application that runs on Microsoft operating systems is used to create a bootable diskette. Both files are available on the CD shipped with the RocketModem IV. The diagnostic can be built using the CD menu system or you can execute **RModem/Diag/Rawrite.exe** directly from the Comtrol CD.

*Note: The application requires you to enter the disk image source file name. The source file name is 1800055X.i; where **X** represents the revision letter of the diagnostic.*

Running the Diagnostics

After creating a bootable diskette, use the following procedure to run the hardware diagnostics:

1. If the machine is on, power down the machine.

2. Insert the diagnostic diskette you created in the diskette drive and power up the machine.

3. If necessary, configure your PC to boot from a diskette.

4. When the title screen displays, press any key to start the diagnostic.

5. Press any key to continue at the **Please Note** screen.

6. At the *RocketModem ISA TYPE SELECTION* screen, select **C** if there are no RocketModem/ISA boards installed, and **Enter**. If there are any RocketModem/ISA boards installed, select the appropriate letter for that model.

7. If the list of installed boards is correct, press **Y** and **Enter**.

If the information is not correct, press **N** and **Enter** to restart the diagnostic.

Note: *The diagnostic resets and re-initializes all modems. The RocketModem IV uses downloadable firmware and the diagnostic also queries the firmware load status. If the firmware has not been loaded, it is downloaded automatically. If the firmware has been loaded, you are asked to select **Y** to reload the firmware or **N** to continue without reloading the firmware.*

8. After initialization completes, an option box displays at the bottom of the screen:

    – **D** to run the *Diagnostic*
    – **T** for Terminal Mode at @ 9600 bits/sec
    – **M** for Terminal Mode at @ maximum bits/sec
    – **Q** to QUIT

9. Select **D** to test the serial I/O, IRQ and telephone type. If you have more than one board installed, the diagnostic repeats until all boards have been tested. Progress messages are displayed on the left bottom of the screen.

    Note: *See [Terminal Mode](#) on Page 12 for information about using the **T** and **M** options.*

10. When prompted by the diagnostic, press any key to continue.

11. After reviewing the *TEST SUMMARY*, press any key to continue. The diagnostic resets all modems and re-initializes all RocketModem boards.

12. To run additional tests, press **Y** and **Enter** to restart the diagnostic at [Step 4](#) or **N** and **Enter** to quit.

13. If you select **N**, remove the diagnostic diskette from the drive, then press the space bar or **Enter** key to boot the system.

    Note: *Do **NOT** use the **CTRL-ALT-DEL** reboot command, may result in CMOS errors on some systems.*

Terminal Mode

If you select either the **T** or **M** Terminal Mode option while running the diagnostic, the diagnostic starts a simple terminal emulation program.

• The **T** option selects terminal mode at 9600 baud.

• The **M** option selects terminal mode at the maximum baud rate supported by your RocketModem model.

If necessary, use the previous discussion to start the diagnostic ([Steps 1](#) through 8). If there is more than one RocketModem installed, you are asked to select a board.

1. When the **Modem Terminal Menu** appears, select the number and press **Enter** that corresponds to the port you want to test with **AT** commands or select one of the following (and **Enter**):

    • **H** for help with **AT** commands

    • **R** to reset a single modem

    • **T** to reset all modems on the selected board

    • **X** to exit

2. Type **AT** commands to communicate with the modem.

3. When you are done, press **Esc** to return to [Step 1](#).

Testing Two Modem Ports

You can use this procedure to test two modem ports. This example requires that phone lines be connected to both Ports 1 and 2.

1. Select **Port 1**.

2. Enter **AT&F0** to initialize the modem to factory default parameters.

3. Enter **ATS0=1** to direct the modem to answer the phone on the first ring.

4. Press **Esc** to return to the port menu.

5. Select **Port 2**.

6. Enter **AT&F0** to initialize the second modem.

7. Enter **ATD***xxx xxxx* (where *xxx xxxx* is the phone number of the line connected to the first modem).

   Watch and wait. The Port 2 modem should dial the Port 1 modem and you should eventually see the *CONNECT* message.

8. Press **Esc**.

9. Select **Port 1**. You should see *RING* and *CONNECT* messages.

10. Type **ATA**. You should now see *CONNECT* messages.

11. Any keys you press while looking at Port 1 display when you look at Port 2. Likewise, any keys you press while looking at Port 2 display when you return to the Port 1 display.

12. To exit, on either of the ports enter the escape sequence **+++**. This enables you to enter **ATH** to hang up, or any other valid **AT** command string.

    If you do not hang up, you can return to the still-active connection by entering **ATO**.

13. To exit terminal mode and return to the port menu, press **Esc**.

FCC Notices

Radio Frequency Interference (RFI) (FCC 15.105)

This board has been tested and found to comply with the limits for Class A digital devices pursuant to Part 15 of the Federal Communications Commission rules.

The RocketModem IV generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with this board, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the distance between the equipment and the receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

Labeling Requirements (FCC 15.19)

The RocketModem IV complies with part 15 of FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and

- This device must accept any interference received, including interference that may cause undesired operation.

Modifications (FCC 15.21)

Changes or modifications to this equipment not expressly approved by Comtrol Corporation may void the user's authority to operate this equipment.

Cables (FCC 15.27)

This equipment is certified for Class A operation when used with unshielded cables.

FCC Part 68 Notice

1. This equipment complies with Part 68 of FCC rules. On the bottom panel of the unit is a label containing the FCC registration number, ringer equivalence number, and the USOC jack code.

2. The RocketModem IV uses FCC compliant modular plugs, it is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is FCC Part 68 compliant.

3. If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But, if advance notice is not practical, the telephone company will notify you as soon as possible. Also you will be advised of your right to file a complaint with the FCC, if you believe it is necessary.

4. The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications in order to maintain uninterrupted service.

5. If the equipment is causing harm to the network, the telephone company may request you to remove the equipment from the network until the problem is resolved. If so, contact Comtrol Corporation at 651-631-7654.

6. No repairs are to be made by you. Repairs are to be made only by Comtrol or its licensees. Unauthorized repairs void the warranty and the registration.

7. This equipment may not be used for public coin phone service provided by the Telephone Company. Connection to Party Line Service is subject to state tariffs. (Contact the state public utility commission, public service commission, or corporation commission for information.)

8. The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device, including fax machines, to send any message unless such message clearly contains in a margin at the top or bottom of each transmitted page or on the first page of the transmission, the date and time it is sent, an identification of the business or other entity, or other individual sending the message, and the telephone number of the sending machine or of such business, other entity, or individual. (The telephone number provided may not be a 900 number or any other number for which charges exceed local or long-distance transmission charges.) In order to program this information into your fax software, you should refer to the manual of the Fax software being used.

The REN (Ringer Equivalence Number) is used to determine the number of devices that may be connected to the telephone line. Excessive RENs on a telephone line may result in devices not ringing in response to an incoming call. In most, but not all areas, the sum of the REN should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the telephone company.

RocketModem IV - Canada

The RocketModem IV connects directly to off-premises Common Carrier facilities using the standard two-wire telephone connection. In some cases, the building's inside wiring associated with a single line individual server may be extended by means of a certified connector assembly (telephone extension card).

NOTICE: *The Industry Canada label identifies certified equipment. This certification means the equipment meets telecommunications network protective, operational, and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction.*

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

> ***Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority or electrician, as appropriate.***

Caution

NOTICE: *The* Ringer Equivalence Number (REN) *assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices, subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.*

This digital apparatus meets the Class A limits for radio noise for digital apparatus set out in the interference-causing equipment standard entitled: "Digital Apparatus," ICES-003 of Industry Canada.

When connecting the RocketModem IV to the telephone service, avoid contact with the telecommunications lead wire. Grasp the insulated part of the jack, and do not contact the back of the circuit board. Telephone wiring can carry dangerous voltages from electrical faults or lightning.

External Wiring

Any external communications wiring you may install needs to be constructed to all relevant electrical codes. In the United States this is the National Electrical Code Article 800. Contact a licensed electrician for details.

Canada - Return Center

In Canada, contact the following Return Center:

> Gandacar Consulting, Ltd
> 189 Lake Avenue East
> Carlton Place, Ontario
> Canada K7C 1J7Phone: **800-563-5102**

Hardware Specifications

Modem Cables

RocketModem IV ports use standard telephone-type unshielded twisted-pair cables with RJ11 modular connectors. These can be purchased anywhere commercial telephone products are sold.

Pin 1 — Pin 4
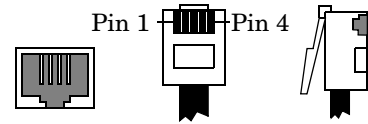
If you choose to build your own cables, use the following information. When building cables, use a UL approved 26-gauge RJ11 telephone line cable or better. The connector pinouts are as shown below:

RJ11 Pins	Signals
1 and 4	Not used
2	Ring
3	Tip

Environmental Conditions

This table illustrates RocketModem IV environmental conditions:

Environmental Conditions	Value
Air temperature: System on System off	0 to 60°C -20 to 85°C
Altitude:	0 to 10,000 feet
Humidity (non-condensing): System on System off	8% to 80% 20% to 80%
Relative humidity (non-condensing:)	10% to 95%

Regulatory Approvals

This table lists regulatory approvals.

Regulatory Approvals	Status
Emission: Canadian EMC requirements ICES-003 CISPR-22: European Standard EN55022 IEC 1000-3-2/EN61000-3-2: Harmonic IEC 1000-3-3/EN61000-3-3: Flicker FCC Part15 Subpart B: Class A limit FCC Part 68 Certification European TBR21 Compliant	Yes
Immunity: EN55024 IEC 1000-4-2: EN61000-4-2: ESD IEC 1000-4-3: EN61000-4-3: RF IEC 1000-4-4: EN61000-4-4: Fast Transient IEC 1000-4-5: EN61000-4-5: Surge IEC 1000-4-6: EN61000-4-6: Conducted disturbance IEC 1000-4-8: EN61000-4-8: Magnetic field IEC 1000-4-11: EN61000-4-11: Dips and Voltage Variations	Yes
Safety: CSA C22.2 No. 60950/UL60950 Third Edition, UL & CUL recognized.	Yes

General Information   The following table illustrates RocketModem IV specifications.

	Description	Specification
RocketModem IV Specifics	Bus interface (meets Universal PCI 2.2 specification or higher)	Universal PCI (PCI and PCI-X compatible)
	Board dimensions (including back bracket)	13.4" by 4.2" (w x h)
	Board dimensions (without back bracket)	11" by 4.2" (w x h)
	Boards per system (maximum)	4
	Current consumption: +3.3V 4-port +3.3V 8-port +5V	800 mA maximum 1.3 A maximum 5.10 mA maximum
	Device driver control: Data bits Parity Stop bits	7 or 8 Odd, Even, None 1 or 2
	Dielectric withstanding voltage	1650 VRMS
	DTE speed	Up to 115,200 bps
	Heat output: 4-Port 8-Port	9.09 BTU/hr 14.54 BTU/hr
	Low Power Sleep Mode	Yes
	Mean time between failures: 4-Port 8-Port	22.7 years 14.72 years
	Modems per board (depends on model)	4 or 8
	Modems per system (depends on model/system)	4 to 32
	Power consumption (board): 4-Port 8-Port	2.67 W 4.32 W
	Surge protection on all ports	Provides ESD surge protection minimum of 15KV @ 200A for a duration of 1 ns.
	Telco connector	RJ11
	Tip/Ring current (continuous)	0 - 120 mA
	REN (Ring Equivalent Number)	0.1B per port
	Weight (board only): 4-Port 8-Port	8 oz 11 oz

	Description	Specification
Modem Characteristics	Supported standards	V.92, K56Plus, V.34, V.32*terbo*, V.32*bis*, V.32, V.22*bis*, V.23, V.21, Bell 212A, Bell 103
	Error correction	V.44, MNP2-4, MNP-10
	Data compression	V.44, V.42*bis*, MNP-5
	Fax group	Group 3
	Fax class	Class 1 and Class 1.0
	Reset	Software controlled
	Baud rate	300 to 56 Kbps, 14.4kbps fax
	Power consumption regular per modem	390 to 500 MW
	Power consumption Sleep Mode per modem	100 to 110 MW
	Transmit/Receive level	10Dbm (Tx), 43Dbm (Rx)

Product Support

Before you call Technical Support you should review the following subsection.

Troubleshooting Checklist

You may want to review the following troubleshooting checklist before contacting Technical Support.

- Verify that the cabling is correct, see *Modem Cables* on Page 16.
- Run the bootable diagnostic, see *Using the Diagnostics* on Page 11.
- Check to see if there is a firmware upgrade available, see *Before Installing the Hardware* on Page 2.
- Verify that you are addressing the port correctly. In many applications, device names above **COM9** require the prefix **\\.** to be recognized. For example, to reference **COM20**, use **\\.\COM20** as the file or port name.
- Check the ftp site to see if there is a more current driver for your operating system than shipped on the CD (see *Before Installing the Hardware* on Page 2).

Contacting Technical Support

Comtrol has a staff of technical support specialists available to help you. If you need technical support, contact Comtrol using one of the following methods.

Contact Method	Corporate Headquarters
FAQ/Online	http://support.comtrol.com/support.asp
Downloads	http://support.comtrol.com/download.asp
Email	support@comtrol.com
Web site	http://www.comtrol.com
Fax	(763) 494-4199
Phone	(763) 494-4100

Trademark Notices

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