RocketModemII™ V.90

Hardware Installation Card

Product Overview

The RocketModemII multimodem card is Hayes®
compatible and contains four or six RJ11 modem ports,
depending on the model, that can operate at speeds up
to 56 Kbps.

RocketModemII features for this model include:

- Four or six RJ11 modem ports
- Bootable diagnostic tests on diskette
- Individual software controlled modem reset
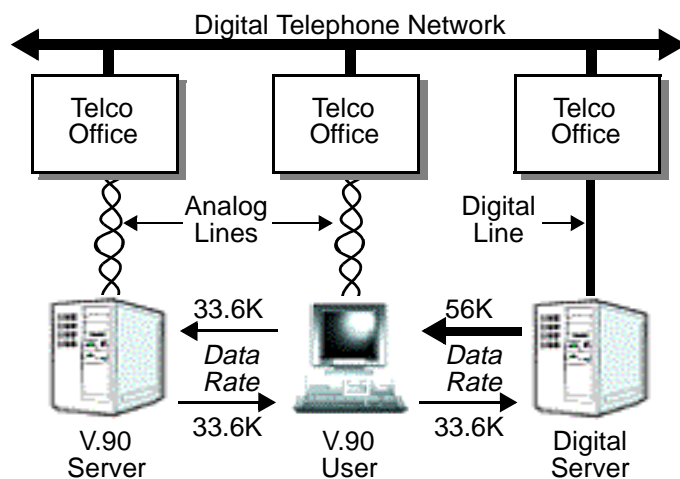 capability
- Speaker

Note: *See the* Software Installation and Configuration
Guide *for information about installing software,
the AT command set, and using the reset feature.*

Characteristic	RocketModemII Support
Supported standards	V.90, K56Plus, V.34, V.32*turbo*, V.32*bis*, V.32, V.22*bis*, V.23, V.21, Bell 212A, Bell 183
Error correction	V.42, MNP2-4, MNP10
Data compression	V.42*bis*, MNP5
Fax group	Group 3
Fax class	Class 1.0 and Class 2
Reset	Software controlled

Note: *If the Comtrol* RocketModemII *is not among the
modem models listed in your software
applications modem list, you can select
SupraFAXModem 288(336) for fax emulation and
Zoom Telephonics Zoom V.34X for modem
emulation.*

Utilizing V.90 Technology

All V.90 modems are analog line devices. The following
figure shows when you can and cannot achieve 56 Kbps.

- V.90 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.90 modems can *send* data over analog (twisted
  pair) phone lines at a maximum rate of 33.6 Kbps—
  even if communicating with other V.90 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.

Installing the RocketModemII

To install a single RocketModemII, follow these steps:

Note: *For best results we recommend installing* RocketModemII *cards one at a time, to simplify the configuration process.*

1. Turn your computer off and remove the system unit cover.
2. Select an available PCI slot and remove the slot cover.
3. Write down the serial number of the RocketModemII.

Card	Model Number*	Serial Number*
1		
2		
3		
4		

* *The tag is located on the back (non-chip) of the card.*

4. Insert the RocketModemII in the expansion slot. Make sure it is seated securely.

   Note: *The RocketModemII features a blue plastic retainer that supports the end of the card. This is* not *a Micro Channel® mounting bracket.*

5. Reinstall the expansion slot cover screw.

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

6. Connect standard RJ11 (telephone) cables between the RocketModemII ports and the phone line jacks.
7. Power up the computer and run the **Diagnostics** program to verify that the RocketModemII is installed and working correctly. For instructions, see the *Using the Diagnostics* discussion in this card.
8. After the RocketModemII has successfully passed diagnostics, install and configure the device driver for your operating system, using the *RocketModem*II *Software Installation and Configuration Guide* or the **README** file released with the driver.
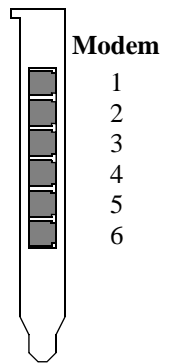
After you have successfully installed one RocketModemII, you can install additional RocketModemII cards by repeating this process.

Port Identification

The modem ports on the RocketModemII mounting bracket are numbered as shown in the illustration at right. The port on the "top" edge of the card is modem Line 1, and the port at the "bottom" edge of the card, nearest the bus connector, is Line 6.

A four-modem version of the RocketModemII card is also available. The four-modem version uses the same mounting bracket and connector block as the six-modem version, but Jacks 5 through 6 are blocked with blank plugs.

The four-modem model is not user-upgradeable to a six-modem model.

Using the Diagnostics

After you have installed one or more RocketModemII cards in your computer, use the diagnostic program **RCKTMDM.EXE** to establish that the card is working, *before* installing the device driver.

The diagnostic program is an operating system-independent program that is distributed on a bootable diskette. You must boot the system from the diagnostic diskette in order to run the diagnostic program.

Note: *The RocketModemII card uses downloadable firmware. This firmware is re-downloaded each time the system is powered up, and may be changed by driver updates. To ensure valid test results, make sure the diagnostic matches the RocketModem driver you are using, so that you are using the same firmware version for both testing and normal use.*

Follow these steps:

1. Insert the **Diagnostics** diskette in the floppy drive.
2. Power up the machine. The diagnostic program starts automatically on boot-up.

   If your computer cannot boot from a floppy, boot up into native MS-DOS, then log on to the a: drive and execute **RCKTMDM.EXE**.

   The diagnostic title screen displays. Note the release number and date. You may need this information if you contact Comtrol technical support.

3. Press any key to continue.

   A message about PCI-bus cards displays. If you have one or more PCI-bus RocketModem cards installed, the diagnostic recognizes them automatically and no entry is needed.

4. Press any key to continue.

   A list of ISA-bus RocketModem models displays.

5. Select the letter that corresponds to the model you installed, select **NOT INSTALLED** if you have no ISA-bus RocketModems in the system, or select **X** to exit the diagnostic.

    If you select an ISA-bus model, a list of valid I/O addresses (A through K) displays:

    a. Select the letter for the I/O address you used when installing the card. A list of valid IRQ interrupts displays.

    b. Select the letter for the IRQ you used when installing the card.

    *Note: Some drivers require an IRQ. If this is a new installation, the correct entry will be **I: NO IRQ**.*

    c. The diagnostic program loops back to Step 5.

    d. If you have more than one ISA RocketModem installed, repeat this step until you have entered the information for all cards. When you are done, select **NOT INSTALLED** to exit this loop.

    Note: Only the first card requires that the I/O address entered in Step 5a matches the physical DIP switch setting. For each subsequent card, select any unused I/O address.

    The list of I/O and IRQ parameters you entered displays.

6. If the list is correct, press **Y**. If the information is not correct, press **N** to restart the diagnostic.

    The diagnostic resets and reinitializes all modems. If your model uses downloadable firmware, 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.

7. After initialization completes, an option box displays at the bottom of the screen:
    – D to run the Diagnostic
    – T for Terminal Mode at 9600 baud
    – M for Terminal Mode at maximum baud
    – Q to QUIT

8. Press **D** to test the serial I/O and IRQ. (The **T** and **M** options are discussed under *Terminal Mode*, below.) The diagnostic tests each RocketModem card's serial I/O, IRQ, and telephone type, and displays the results.

9. Press any key to continue. If you have more than one card installed, the diagnostic repeats until all cards have been tested.

10. Press any key to continue. The diagnostic displays a summary of the test results.

11. Press any key to continue.

    The diagnostic resets all modems and reinitializes all RocketModem boards.

12. Press **Y** to restart the diagnostic at Step 3 (for example, to enter Terminal Mode), or **N** to quit.

    If you select **N**, remove the diagnostic diskette from the drive, then press the spacebar or Enter key to boot the system. ***Do not use the CTRL-ALT-DEL reboot command.*** Use of this command may result in CMOS errors on some systems.

Note: The Terminal Mode option is used to test modems by dialing out using AT commands. For an example of how to use this option, see **Terminal Mode***, later in this* Installation Card*.*

Troubleshooting

If an ISA-bus modem card fails to initialize, check to make sure you have selected the correct I/O address and IRQ. If that does not solve the problem, try removing the card and reseating it in another slot.

If you have tried any "short cuts" in running the diagnostic, try rebooting your system from the floppy. The diagnostic *WILL NOT WORK* in a "DOS over Windows" session.

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

1. If there is more than one RocketModem installed, you are asked to select a card. Do so.

2. A numbered menu listing the ports on the selected card displays. You may also press **H** for help with AT commands, **R** to reset a single modem, **T** to reset all modems on the selected board, or **X** to exit.

3. Enter a port number to select a modem. The Terminal Mode screen displays.

4. Type AT commands to communicate with the modem.

5. When you are done, press **Esc** to return to Step 2.

For example, follow these steps 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. 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.

11. 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**.

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

Using the Speaker

The RocketModemII 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.
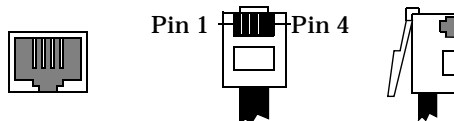
The following table lists some of the more commonly used speaker-related AT commands. For a complete list, see the AT Commands reference.

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.

Modem Cables

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

If you choose to build your own cables, use the following information. When building cables, use Category 3 (or better) unshielded twisted-pair wiring.

Pin 1 Pin 4

The connector pinouts are as shown below:

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

FCC Notices

Radio Frequency Interference (RFI) (FCC 15.105)
This card has been tested and found to comply with the limits for Class B digital devices pursuant to Part 15 of the Federal Communications Commission rules.

The RocketModemII generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with this card, 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 RocketModemII 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 B 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 RocketModemII 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.

RocketModemII - Canada

The RocketModemII 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.

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

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 B 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 RocketModemII 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 1J7   Phone: **800-563-5102**

Operating Conditions

This table illustrates environmental conditions:

Environmental Conditions	Value

Air temperature:
  System on
  System off
	0 to 40°C
	-20 to 85°C

Altitude:	0 to 10,000 feet

Humidity (non-condensing):
  System on
  System off
	8% to 80%
	20% to 80%

Hardware Specifications

The following table illustrates hardware specifications:

Description	Specification
Baud rate	300 to 56 Kbps
Bus interface	PCI
Card dimensions (meets PCI specifications)	12.4" by 4.2" (w x h)
Cards per system	4

Current consumption (+5V):
  RocketModemII 4
  RocketModemII 6
	1.7A max
	2.3A max

Device driver control:
  Data bits
  Parity
  Stop bits
	7 or 8
	Odd, Even, None
	1 or 2

Heat output:
  RocketModemII 4
  RocketModemII 6
	29 BTU/hr
	39.2 BTU/hr

Interrupt (driver dependent)	None, 3, 4, 5, 9, 10, 11, 12, and 15

Mean time between failures:
  RocketModemII 4
  RocketModemII 6
	18.3 years
	13.7 years

Modems per card	4 or 6
Modems per system	4 to 24

Power consumption:
  RocketModemII 4
  RocketModemII 6
	8.5 W
	11.5 W

Telco connector	RJ11

Weight (card only):
  RocketModemII 4
  RocketModemII 6
	10 oz
	11 oz

Electromagnetic Compliance

This table lists electromagnetic compliance certifications:

Electromagnetic Compliance	Status

Emission:
  Canadian EMC requirements
  FCC Class B Certification
	Yes

Safety: UL Listed	Yes
FCC Part 68 Certification	Yes

Technical Support

If you need technical support, contact Comtrol using one of the following methods.

Corporate Headquarters:

- email: **support@comtrol.com**
- FAX: (651) 631-8117
- Phone: (651) 631-7654
- FTP Site: ftp://ftp.comtrol.com
- Web Site: http://www.comtrol.com

Comtrol Europe:

- email: **support@comtrol.co.uk**
- FAX: +44 (0) 1 869-323-211
- Phone: +44 (0) 1 869-323-220
- Web Site: http://www.comtrol.co.uk

Comtrol has a staff of technical support specialists available to help you.

First Edition, December 21, 1998
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