
RM1600

Card Cage

RM1600
Modem Rack

Owner's Manual

Owner's Manual
82047705 Revision F
RM1600 MODEM RACK

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Record of Revisions

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E (10/13/97)	Manual revised to include safety warnings and CE mark information.
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Patents

This Product is covered by one or more of the following U.S. Patent Numbers: **5.301.274; 5.309.562; 5.355.365; 5.355.653; 5.452.289; 5.453.986.** Other Patents Pending.

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Chapter 1 - Introduction and Description

Introduction

Welcome to the world of data communications. You have one of the finest modem rack made today. This owner's manual provides information that will help you to install and operate your Black Box RM1600 Modem Rack. This manual covers the description of the modem rack, its technical specifications, power supply, procedures for modem installation, RS232C and phone line connections and powering up mode.

Description

The BlackBox RM1600 modem rack is designed to house up to 16 modems in a single standard 19-inch rack enclosure. The modem rack accommodates a variety of modems, is capable of redundant power for uninterrupted service, and is available with either standard RJ11 jacks (models with "-11L" suffix) or RJ21 multi-line jacks (models with "-21" suffix). Both versions are available for use with either universal AC input or -48v DC power.

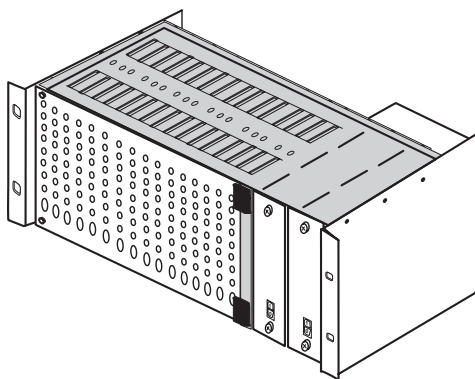


Figure 1-1. RM1600

The RM1600 is a generic rack that accommodates a variety of rackmount modems and DSUs. The RM1600 series is designed specifically for V.34 modems. Both rack models come in -11L and -21 versions. The -11L version connects to standard RJ11 telephone phone cords. The -21 version has three 50-pin connectors for dial-up and 2-wire or 4-wire leased lines. Both models are equipped for universal AC input or -48v DC. Finally, both models are available with either a single power supply or dual (redundant) power supplies for uninterrupted power. A single power supply can maintain a full complement of modems.

The RM1600-series rack makes it easy for you to monitor your data communications. Each modem has its own set of LEDs, with separate indicators for Receive Data, Transmit Data, Carrier On, Speed, Off Hook, Data Terminal Ready, Ring Indicator, and Error (Out-of-Service and Busy).

The rack measures 19" wide, 7" high, and 15" deep. The rack is usually mounted in the same cabinet as your computer, or can be enclosed in a separate cabinet of its own. Modems are installed by simply opening the rack front door and sliding in the modems. RS232C cables and phone cords are connected to modem connectors at the back of the rack.

Technical Specifications

Rack Capacity:	Up to 16 modems
Connectors:	IEC 320 Inlet Power Connector
Dimensions:	19" wide x 7" high x 15" deep 48.26cm wide x 17.8cm high x 38.1cm deep
Weights:	Rack with one power supply: 21lbs. (9.5 kg) Rack with two power supplies and 16 modems: 30 lbs. (13.6 kg)
Power Supply Input:	PS1600 - 90 to 245 Volts AC, 2.0 Amps PS1648 - -40 to -56 Volts DC, 2.5 Amps
Power Consumption:	70 watts, for a fully loaded rack
Ambient Temperature:	32° to 120° F (0° to 50° C)
Indicators:	One LED per power supply

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Chapter 2 - Installation

Introduction

Black Box rackmount modems are generally used in a central site computer environment (i.e., connected to a mini or mainframe computer) to automatically answer incoming calls from remote users.

Command mode should be disabled unless you wish to give the modem commands. Leaving command mode enabled offers the possibility of a user calling into the modem and reconfiguring it, or causing it to dial out. Refer to the appropriate modem owner's manual to configure the modem for your application.

Safety Warnings

1. Never install telephone wiring during a lightning storm.
2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
4. Use caution when installing or modifying telephone lines.
5. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
6. Do not use the telephone to report a gas leak in the vicinity of the leak.

Safety Recommendations

The following safety recommendations should be observed when installing Black Box RM1600-series modem racks.

- Ensure proper installation of the RM1600 modem rack in a closed or multi-unit enclosure by following the recommended installation as defined by the enclosure manufacturer. Do not place the RM1600 modem rack directly on top of other equipment or place other equipment directly on top of the RM1600 rack.
- If installing the modem rack in a closed or multi-unit enclosure, ensure adequate airflow within the rack so that the maximum recommended ambient temperature is not exceeded.
- Ensure that the modem rack is properly connected to earth ground via a grounded power cord. In the event that a power strip is used, ensure that the power strip provides adequate grounding of the attached equipment.
- Ensure that the mains supply circuit is capable of handling the load of the modem rack. Refer to the power label on the equipment for load requirements.
- Maximum recommended ambient temperature for the CC1600 is 50° C (120° F).
- This equipment should be installed only by properly qualified service personnel.
- Only connect like circuits. In other words, connect SELV (Secondary Extra Low Voltage) circuits to SELV circuits

and TN (Telecommunications Network) circuits to TN circuits.

Installation

Perform the following procedure to install the RM1600-series modem rack and install up to 16 modems in the rack.

1. Unpack the rack and check all items against the shipping list to ensure that you have received the correct items.

Rack Components

- A. Rack
 - B. Power Cord
 - C. Owner's Manual
2. Inspect the rack for visible shipping damage. If damage is observed, do not power-on the rack; contact Black Box Technical Support for advice (refer to Chapter 3).
 3. If no damage is observed, mount the rack in a standard 19-inch wide rack enclosure. Mounting hardware should be provided with the rack enclosure.
 4. If power supply is not installed in rack, refer to the following section for power supply installation. If the power supply is already installed, proceed to step 5.
 5. Open the rack front door.
 6. Unpack the modems to be installed in the rack.
 7. Refer to the RackMounted Modem Owner's Manual for the switch settings and parameters which pertain to your application (dial-up/leased-line).
 8. Slide a modem into one of the 16 available slots. The component side of the card should be to the right as in Figure 2-1. The modem's gold edge connector will mate with the rack's backplane. The edge connector is offset vertically so the modem cannot be inserted upside down.

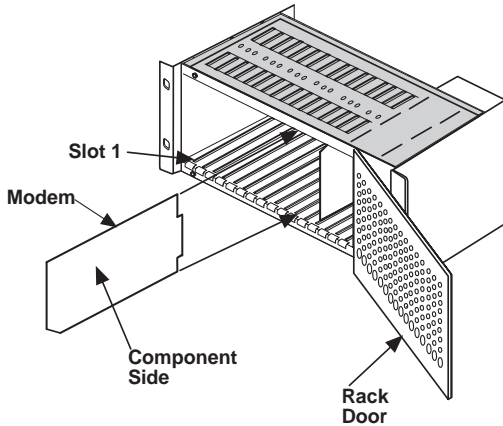


Figure 2-1. Modem Installation

9. Firmly seat the modem card into the backplane connector.
10. Repeat steps 7 through 9 for the remaining modems.
11. Connect an RS232C cable to the DB25 connector (25-pin female connector) on the backplane of the rack. Start by connecting the RS232C cable to the right-most channel (slot 1) as viewed from the back of the rack.

Note: Any cables connected to the computer should be shielded to reduce radio frequency interference. Keep track of which computer channel belongs to which modem in the rack. Most computer interface buses are grouped in sixteens, which enables you to match modem and computer channel numbers.

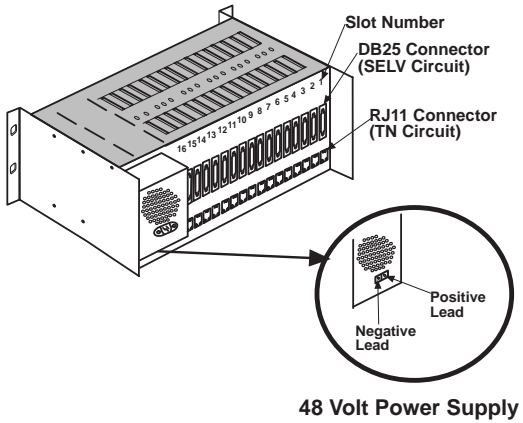


Figure 2-2. Cable Connections

12. If you are connecting your phone line directly to an RJ11 jack on the backplane of the rack, plug the telephone cord into the RJ11 jack on the appropriate modem.

If you are connecting a -11L rack to leased lines or leased lines with dial back-up, a Dial/Leased Splitter is required between the leased line jack and the RJ11 jack on the backpanel of the rack. The single RJ11 plug connects to the RJ11 jack on the backpanel of the rack. The RJ11 jack labeled Leased connects to the leased line connector. If dial-back up is used, the RJ11 jack labeled dial should be connected to the dial-back up line.

Note: The Dial/Leased Splitter is a custom part (a "Y" cable) which includes an RJ11 plug that plugs into the RJ11 jack on the backplane of the rack and is a 5-inch-long six-conductor cable terminated at two RJ11 jacks. One jack is labeled Leased and the other Dial.

If you are connecting your phone lines (-21 series rack) to the 50-pin connector on the backplane of the rack, plug the appropriate phone cable into the appropriate 50-pin connector (RJ21X). RJ21X connectors are TN circuits.

Note: Three 50-pin connectors are mounted on the back of the -21 series rack backplane. The left 50-pin connector (labeled Dial-Up/2-Wire Leased Line) is used to connect all the modems in the -21 series rack to dial-up phone lines. When 4-wire leased lines are being connected, the two right 50-pin connectors (labeled 2-wire Lease Line/4-wire Transmit Pair on the right and 4-wire Receive Pair in the center) are used to connect the rack to leased lines. When connecting to 2-wire leased lines, you must first determine if your modem has dial back-up capability. If it does, then use the right connector. If it does not, then use the left (2-wire Lease Line) connector.

13. If an AC power source is being used, plug the AC power cord supplied with the rack into the power cord connector on the back of the rack and to a live AC outlet.

If a DC power source is being used, connect the negative lead from the DC supply to the left terminal on the terminal block on the back of the rack and the positive lead from the DC supply to the right terminal on the rack.

Power Supply Installation

The RM1600-series modem rack is configured with either a single power supply or two (hot-swappable, redundant) power supplies. A single power supply can maintain a full complement of 16 modems or DSUs. To install a power supply, perform the following procedure.

1. Unpack the power supply and check for visible shipping damage. If damage is observed, do not install the power supply; contact Black Box Technical Support for advice (refer to Chapter 3).

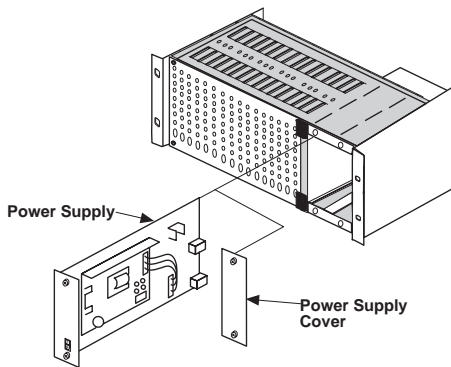


Figure 2-3. Power Supply Installation

2. Using a Phillips screwdriver, loosen the two power supply cover mounting screws and remove the cover from the slot where you intend to install the power supply.
3. Slide the power supply into the two mating card guides and firmly seat the power supply connectors into the backplane connectors.

4. With a Phillips screwdriver, tighten the power supply screws.
Warning: If only a single power supply is used, then the unused opening should have a power supply cover in place.
5. If a second power supply is being installed, repeat steps 1 through 4.
6. Return to the rack installation procedure to continue installing the rack.

Powering Up

Once the power switch is turned on, the green LED on the power supply(s) should be lit and the modems perform a diagnostic self-test, indicated by the speed LEDs flashing in sequence for approximately two seconds. If none of the modems have power to them or the power supply LED(s) is not lit, check the power cord connection and check that the AC outlet is live. If one of the green power supply LEDs on the front of the rack is not lit, then one of the redundant power supplies may be defective or not installed correctly (i.e., not making proper contact).

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**Chapter 3 - Service, Warranty
and Tech Support**

Introduction

This chapter starts out with statements about your Black Box RM1600 modem rack 1-year warranty. The next section, Tech Support, should be read carefully if you have questions or problems with your modem rack.

It includes the technical support telephone numbers, space for recording your product information, and an explanation of how to send in your modem rack should you require service.

Tech Support

Black Box has an excellent staff of technical support personnel available to help you get the most out of your Black Box product. If you have any questions about the operation of this unit, call (724)746-5500.

Service

If your tech support specialist decides that service is required, your rack may be sent to our factory.

Include the following with your rack:

- a description of the problem.
 - return billing and return shipping addresses.
 - contact name and phone number.
-
- if possible, note the name of the technical support specialist with whom you spoke.

If you need to inquire about the status of the returned product, be prepared to provide the **RMA #** of the product sent

Send your rack to this address:

Black Box Corporation
1000 Park Drive
Lawrence, Pa. 15055

About the Internet

Black Box is a commercial provider on the Internet. If you prefer to receive service via the internet, you can contact Tech Support via e-mail at the following address:

http://www.techsupport@blackbox.com

Black Box presence includes a Web site at:

<http://www.blackbox.com>

and an ftp site at:

<ftp://ftp.blackbox.com>

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Appendices

Appendix A - Safety Requirements

1. No manual adjustments to the equipment are necessary for connection to mains power within rated voltage and frequency.
2. The power supply cord is intended to serve as the disconnect device. The socket-outlet must be installed near the equipment and be easily accessible.
3. To reduce the risk of shock, all openings should be covered during normal operation of the equipment.
4. Use only plugs and cordage for connection of the power supply to primary power which meets the safety and regulatory requirements in the country of use.
5. Conductors must have a cross-sectional area of not less than 1.00 mm².

Exigences de sécurité

1. Aucun réglage manuel de l'équipement n'est nécessaire pour des connexions à l'alimentation principale sous une tension et une fréquence nominales.
2. Le cordon d'alimentation a été conçu pour servir de dispositif de déconnexion. La prise d'alimentation doit être installée près de l'équipement et doit être facile d'accès.
3. Afin de réduire les risques de choc, toutes les ouvertures doivent être couvertes pendant le fonctionnement normal de l'équipement.
4. N'utiliser que des prises et cordons d'alimentation répondant aux normes de sécurité du pays de destination.
5. La superficie de la section des conducteurs doit être supérieure ou égale à 1,00 mm².

Requisitos de seguridad

1. No son necesarios ajustes manuales del equipo para la conexión a la corriente de la red dentro del voltaje y frecuencia establecidas.
2. El conector de alimentación de energía sirve como dispositivo de desconexión. La toma de corriente se debe instalar cerca del equipo y tener un acceso sencillo.
3. Para reducir el riesgo de sacudida eléctrica, todas las aberturas deben estar cubiertas durante el manejo normal del equipo.
4. Utilice solamente los enchufes y cables para la conexión del suministro de energía a la energía primaria que cumplan con los requerimientos regulativos y de seguridad del país en que se usen.
5. Los conductores deben tener un área transversal mayor de 1,00 mm².

Sicherheitsanforderungen

1. Bei Anschluß am Versorgungsnetz innerhalb der Nennleistung und -frequenz ist es nicht erforderlich, dieses Gerät manuell nachzustellen.
2. Die Netzschnur dient als Trennvorrichtung. Die Steckdose muß in der Nähe des Geräts installiert werden, um leicht zugänglich zu sein.
3. Um Elektroschockgefahr zu vermindern, müssen beim normalen Betrieb des Geräts alle Öffnungen abgedeckt sein.
4. Zum Anschluß an das Primärstromnetz nur Stecker und Anschlußkabeln benutzen, die den Sicherheits- und Überwachungsvorschriften des Landes entsprechen, in dem sie angewendet werden.
5. Leitungsdrähte müssen einen Durchmesser von mindestens 1,00 mm² haben.

Mains Wiring Instructions (U.K.)

When wiring the mains plug, the following instructions must be followed:

- the core which is coloured green and yellow must be connected to the terminal in the plug which is marked with the letter E or by the earth symbol \perp , or coloured green and yellow.
- the core which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
- the core which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

Power Requirements

AC 90-245V, 50/60 Hz, 2.0A

DC 40-56V, 2.5A

CAUTION: Safety requirements are not fulfilled unless the equipment is connected to a wall outlet socket that is provided with an earth contact.

Alimentation Requite

C.A. 90-245 V, 50/60 Hz, 2.0A

DC 40-56V, 2.5A

ATTENTION: Les conditions de sécurité ne sont pas remplies si votre équipement n'est pas branché sur une prise murale avec mise à la terre.

Requisitos de potencia

C.A. 90-245 V, 50/60 Hz, 2.0 Amp
DC 40-56V, 2.5A

ATTENCION: Advertase que los requisitos respecto a medidas de seguridad no quedan satisfechos a menos que este equipo eléctrico esté conectado a una toma de corriente mural conectada a tierra.

Stromaufnahme

AC 90-245V, 50/60 Hz, 2.0A
DC 40-56V, 2.5A

VORSICHT: Die Sicherheitsvorschriften sind nur erfüllt, wenn das Gerät an eine geerdete Wandsteckdose angeschlossen ist.

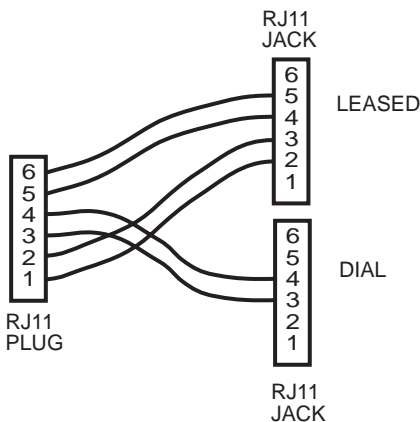
Appendix B - Cabling

Introduction

This appendix shows the cable and connector pinouts for the RM1600 rack.

Dial/Leased Splitter

The Dial/Leased Splitter consists of an RJ11 plug at one end of a 5-inch cable that plugs into the RJ11 jack on the backplane of the RM1600 rack. The other end of the cable has two RJ11 jacks that connect to a leased line and, if dial back-up is used, the Dial jack provides that connection.



-21 Series Connector Pinouts

Three 50-pin connectors are used on the -21 series rack; they are located at the top of the backplane. The Dial-up/2-Wire Leased connector is to the left (as viewed from behind the chassis), the 4-wire Receive connector is in the center, and the 2-Wire Leased/4-Wire Transmit connector is on the right side of the backplane. Pinouts for each connector are shown below.

