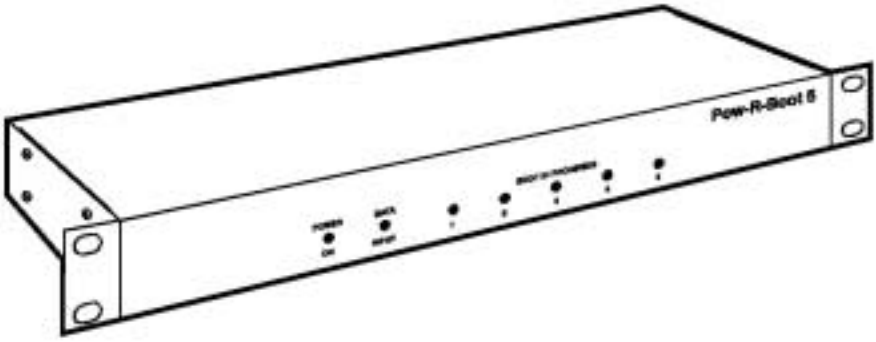
1000 Park Drive • Lawrence, PA 15055-1018 • 724-746-5500 • Fax 724-746-0746

BLACK BOX®
NETWORK SERVICES

SEPTEMBER 2000
SWI020A-R2
SWI020AE-R2

Pow-R-Boot 5+



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Order **toll-free** in the U.S. 24 hours, 7 A.M. Monday to midnight Friday: **877-877-BBOX**
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FEDERAL COMMUNICATIONS COMMISSION
AND
INDUSTRY CANADA
RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate 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 communication. It 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 against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

NORMAS OFICIALES MEXICANAS (NOM)
ELECTRICAL SAFETY STATEMENT

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.

2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.

3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.

8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.

9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

    A: El cable de poder o el contacto ha sido dañado; u

    B: Objectos han caído o líquido ha sido derramado dentro del aparato; o

    C: El aparato ha sido expuesto a la lluvia; o

    D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

    E: El aparato ha sido tirado o su cubierta ha sido dañada.

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Contents

Chapter **Page**

1. Specifications

Compliance—FCC Class A, DOC Class/MDC classe A

Interfaces—RS-232 compatible serial DB9 (DTE)

Protocol—Asynchronous

Data Format—*Receive:* Either 7 data bits, even or odd parity, and 1 stop bit, or 8 data bits, no parity, 1 stop bit (autosensing); *Transmit:* 8 data bits, no parity, 1 stop bit (fixed)

Flow Control—None

Data Rate—9600 or 2400 bps (user-selectable)

Maximum Distance—50 ft. (15.2 m) from control port to master device

User Controls—Commands from master device; *(3) Rear-mounted:* (1) 4-position configuration DIP switch,(1) On/Off rocker switch, (1) Default switch

Indicators—*(7) Front-mounted LEDs:* (1) Power On, (1) Data Input, and (5) Boot in Progress

Connectors—*Data:* Rear-mounted, DB9 male for connection to PC or modem; *AC Power Inlet:* SWI020A-R2: Nondetachable power cord with NEMA 5-15P plug; SWI020AE-R2: IEC 320 male; *AC Power Outlets:* SWI020A-R2: (5) NEMA 5-15R sockets; SWI020AE-R2: (5) IEC 320 female

Leads Supported—DB9 connector: Pins 1, 2, 3, 4, 5, and 7 (RLSD [DCD], RD, TD, DTR, SGND, and RTS respectively)

Temperature Tolerance—32 to 122°F (0 to 50°C)

Input Power—*SWI020A-R2:* 115 VAC, 60 Hz directly from outlet through nondetachable 6-ft. (1.8-m) power cord; *SWI020AE-R2:* 230 VAC, 60 Hz directly from outlet through detachable power cord (not included)

Output Power—*SWI020A-R2:* 115 VAC, 60 Hz, up to 15 amps on one outlet (but not more than 15 amps total for all outlets); *SWI020AE-R2:* 230 VAC, 50 Hz, up to 15 amps on one outlet (but not more than 15 amps total for all outlets)

Size—18"H (1U) x 17"W x 6.5"D (4.6 x 43.2 x 16.5 cm); when rackmount brackets are added, the unit is 19" (48.3 cm) wide

Weight—5 lb. (2.3 kg)

2. Introduction

2.1 Overview

Network equipment sometimes “locks-up,” making it impossible to communicate. The Pow-R-Boot 5+ (PRB 5+) remote power boot switch can switch AC power on five individually controlled plugs, allowing attached equipment to reset (reboot).

ASCII commands are sent to the RS-232 control port to select plugs, and specify On, Off, or Boot operations. A convenient Status Screen shows On/Off conditions at each plug. The Pow-R-Boot 5+ includes a security password, Location I.D. field, and plug labels to identify the device connected to each plug.

2.2 Features

- Remotely toggles AC power to five separate outlets.
- Serial RS-232 control port interfaces directly with a PC or external modem.
- Allowing local or remote control.
- Status display shows plug labels and on/off conditions.
- Simple ASCII commands for On, Off, or Boot (Off/On).
- User-selectable re-boot cycle duration (Off Time).
- User-programmable password feature.
- User-programmable Location I.D.
- User-selectable echo mode.
- User-programmable plug labels.
- User-programmable power-up defaults.
- Requires only one rack space.
- Available in 115-VAC or 230-VAC configurations.

2.3 The Pow-R-Boot 5+ Illustrated

2.3.1 The Front Panel

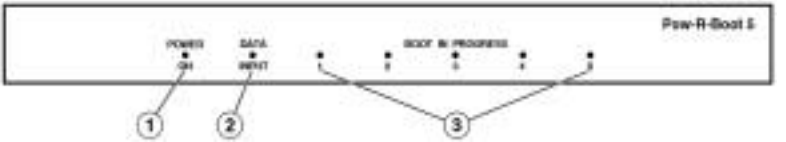

Figure 2-1. The front panel of the Pow-R-Boot 5+.

① **POWER ON:** Lights when the Pow-R-Boot 5+ is receiving AC power and is ready to receive commands.

② **DATA INPUT:** Flashes when the Pow-R-Boot 5+ receives commands via the control port.

③ **BOOT IN PROGRESS (Plugs 1 through 5):** The LEDs light one at a time when a reboot cycle is in progress at the Pow-R-Boot 5+'s corresponding AC outlet.

2.3.2 The Rear Panel

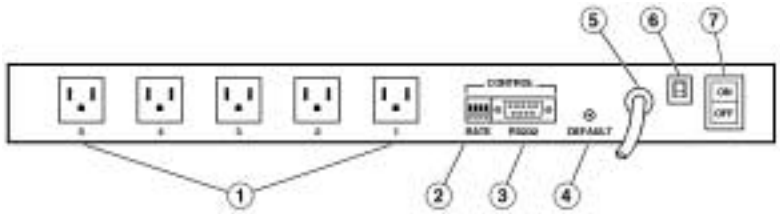

Figure 2-2. The rear panel of the Pow-R-Boot 5+ (115-VAC model shown).

① **AC Outlets 1 through 5:** The devices whose rebooting you want to control must be plugged into these outlets. On the 115-VAC model (SWI020A-R2), the outlets are North American standard NEMA 5-15R sockets; on the 230-VAC model (SWI020AE-R2), they are international standard IEC 320 female connectors. Each outlet can deliver up to 15 amps, and the total current drawn from all five outlets must not exceed 15 amps. See **Section 3.4** for more information.

② **Rate Switch:** A four-position DIP switch used to set the control port baud rate, select the Off-Time, enable/disable the Password Option, and enable/disable the Read-Only Mode. See **Section 3.1** for more information.

③ **RS-232 (Control) Port:** A male DB9 connector used for connection to an external modem or local PC. The Pow-R-Boot 5+ will switch plugs on/off in response to ASCII commands received via the control port. See **Section 3.3** for more information.

④ **Default Button:** Reads Rate Switch settings and sets parameters accordingly. This allows the user to change Rate Switch settings without re-booting the Pow-R-Boot 5+ and connected devices. The Default button can also be used to bypass the Password Prompt.

⑤ **115-VAC Units (SWI020A-R2):** Nondetachable 6-ft. (1.8-m) power cord with a North American standard NEMA-5-15P plug.

230-VAC Units (SWI020AE-R2): An international standard IEC 320 male inlet to which you can connect a power cord appropriate for your geographical area.

⑥ **Circuit Breaker:** 15 amps

⑦ **Power Switch**

3. Installation

3.1 Setting the Rate Switch

The Rate Switch selects the control port baud rate, sets the boot cycle Off-Time, and enables/disables the Password Option and Read-Only Mode. If switch settings are changed while the unit is powered on, press the Default button to re-read the switch settings. The Default button allows the user to change switch settings while power is on, without rebooting the PRB 5+ and connected devices.

NOTE

If Rate Switch settings are changed while the unit is powered on, new settings will not take effect until the Default button is pressed, or the Pow-R-Boot 5+ is powered off and on.

Switch Position	Function	UP	DOWN
1	Control Port Baud Rate	2400 bps	9600 bps*
2	Off-Time	10 sec.	5 sec.*
3	Password Function	Disable	Enable*
4	Read-Only Mode	Enable	Disable*

*** = Factory Setting**

Control Port Baud Rate: Use DIP-switch-position 1 to select the data rate you want the PRB 5+ to use for Control port communication. The device attached to the Control port must be set to the same data rate.

Off-Time: Switch position 2 selects the "Off-Time" for the reboot cycle. The Off-Time determines how long the Pow-R-Boot 5+ will keep AC power off before restoring it when you send a reboot (toggle power) command.

Select the 10-second Off-Time if the attached device needs to be off longer than 5 seconds in order to properly reinitialize.

Password: When position 3 is set DOWN (factory setting), a password will be required in order to access the Pow-R-Boot 5+ command mode. The default password is [Enter]. To redefine the password, please refer to **Chapter 4**.

Read-Only Mode: When position 4 is set in the UP position to enable the Read-Only Mode, the /P command (Define Parameters) is disabled. This allows the user to invoke On/Off/Boot commands, but prevents redefinition of parameters such as the Password and Power-Up Default.

3.2 Rackmounting the Unit

You can use the included screws and rackmount brackets to mount the Pow-R-Boot 5+ in any standard 19" rack. If you would rather mount the PRB 5+ in a 24" rack, call Black Box for a quote on special brackets.

3.3 Connecting the Master Device

The Control Area on the Pow-R-Boot 5+ rear panels includes a DB9 male connector labeled "RS-232." Use this input to connect the PRB 5+ to the master device. **Figure 3-1** shows the control port interface.

Connecting Devices to the RS-232 Port

The PRB 5+'s RS-232 port is a DB9 male connector wired in a DTE configuration similar to that of an IBM® AT® computer. When connecting an external modem, use a standard AT modem cable (our product code EVMBMC).

Make certain the modem is initialized at the same baud rate as the PRB 5+ (Rate Switch 1). The modem must be placed in auto-answer mode, and set to answer in one ring. Please refer to your external modem's users' guide to determine the appropriate AT command string.

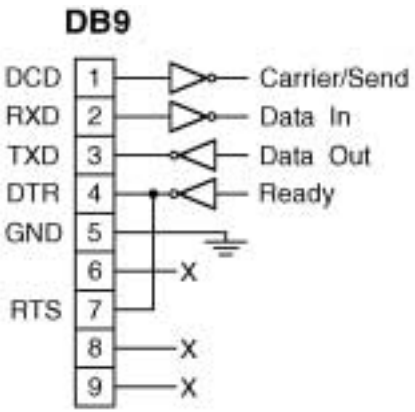

Figure 3-1. Pinout of the RS-232 port.

3.4 Connecting Switched Devices

Plug the power cords or the power-supply input cords of each of the devices whose rebooting you want to control into one of the five AC outlets on the rear panel of the Pow-R-Boot 5+. Make sure that the power switches of these devices are all turned ON. When the PRB 5+ is powered up, the five AC outlets will be set ON or OFF as determined by the Power-Up Default string (see **Chapter 4**).

Each of the PRB 5+'s AC outlets is capable of switching up to 15 amps of AC power. The total current load on all five outlets cannot exceed 15 amps.

3.5 Powering Up the System

If your Pow-R-Boot 5+ is the 230-VAC model, connect an appropriate power cord to the IEC 320 male power inlet on its rear panel.

Now plug the Pow-R-Boot 5+'s power cord into a working AC outlet and turn ON the PRB 5+'s ON/OFF switch. The PRB 5+'s POWER ON LED should light.

When power is applied, the PRB 5+'s five AC outlets will be set ON or OFF as determined by the Power-Up Default String (described in **Chapter 4**).

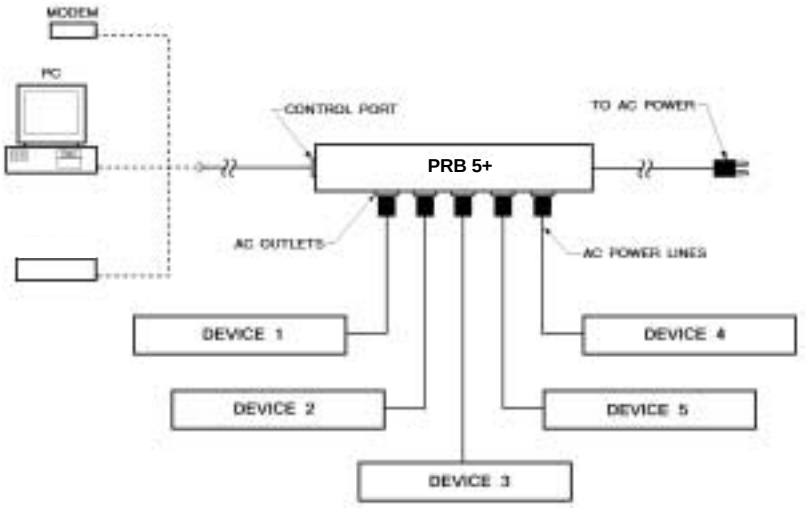

Figure 3-2. Typical application for the Pow-R-Boot 5+.

4. Start-Up/Configuration

This section describes the procedures used to access the Pow-R-Boot 5+ command mode and configure the unit to fit the requirements of your application.

1. **Access the Pow-R-Boot 5+:** The PRB 5+ is transparent to parity and will accept 7 or 8 bit characters, but will always answer back at 8 bits, no parity. Make certain your communications program (for example, ProComm®) is set for the appropriate baud rate, bits, and parity. We recommend that you set the communications program for TTY mode.

   a) **Via Modem:** Start your communications program. Dial the external modem connected to the PRB 5+. Wait for the Connect message and proceed to Step 2.

   b) **Via Local PC:** Start your communications program.

2. **Password:** If the Password function is enabled, the unit will display a prompt. Key in the Password and press [Enter]. If the password has not yet been defined, just press [Enter].

NOTE

The Password feature is case-sensitive.

If you forget your password, press the Default button when the Password Prompt appears, then invoke the /P command to display the password.

3. The PRB 5+ will display the Status Screen (**Figure 4-1**).

4. When the command prompt appears, type **/P** and press [Enter] to define system parameters. The unit will display a series of prompts.

NOTES

Pow-R-Boot 5+ commands are not case-sensitive.

To skip a prompt without changing its current definition, press [Enter].

To exit from the Define Parameters function, press [Esc] at any time. Parameters defined up to that point will be saved.

   a) **Location:** Key in a text string that describes the Pow-R-Boot 5+ location (up to 23 characters).

```
Location:SITE I.D.
Default: 0110

Plug      Label               Condition
1         PRINTER             Off
2         SERVER ONE          On
3         SERVER TWO          On
4         MODEM BANK          On
5         FAX                 Off

Command Summary:
/S   Status
/P   Enter Parameters
/D   Set Plugs to Default
/X   Exit

To Switch /n s Where n=Plug and s=ON/OFF/BOOT
```

Figure 4-1. The Pow-R-Boot 5+ Status Screen.

b) **Password:** The currently defined password is displayed next to the prompt. To re-define the password (Default = [Enter]), key in the new password (up to 8 characters) and press [Enter]. The password can include blank spaces and higher-order ASCII characters. Note that the Backspace key will not function during password definition.

c) **Default (Power-Up Default):** Allows the user to define default On/Off conditions for each switched plug as described in on the next page. Key in the desired Power-Up Defaults and press [Enter].

d) **Echo Mode:** When Echo Mode is enabled, commands sent to the PRB 5+ will be echoed back to your PC or terminal, allowing keyboard entries to be displayed by your communications program. To enable or disable the Echo Mode, type **Y** or **N**, press [Enter], then continue with the parameter definition routine. When the command prompt returns, type `/D` and press [Enter].

NOTES

The Echo Mode will not be enabled/disabled until the /D command is invoked.

If the Power-Up Default String includes invalid or missing characters, the /D command will not function.

e) **Plug Labels:** Allows the user to identify the device connected to each plug (for example, "**SERVER**"). Key in the desired name (up to 16 characters) and press **[Enter]**.

The Power-Up Default String

The Power-Up Default String allows the user to select default On/Off conditions for each switched AC outlet. When the Pow-R-Boot 5+ is powered up, or when the /D command (Set Defaults) is invoked, each outlet will be set according to the Default String.

NOTES

The Power-Up Default String includes five characters; each character determines the default On/Off condition for the corresponding plug. The first character applies to plug 1, the second character applies to plug 2, and so on.

To set a plug to default ON, enter a one (1); to set a plug to default OFF, enter a zero (0).

If the Default String includes invalid or missing characters, plugs will be switched OFF when the unit is powered up, regardless of the conditions shown by the Status Screen. In addition, the /D command will not function.

Example 1: To set default On/Off conditions as follows:

ON: Plugs 1 and 5
OFF: Plugs 2, 3, and 4

The Power-Up Default String would be defined as "`10001`."

Example 2: To set default plug conditions as follows:

ON: Plugs 3, 4, and 5
OFF: Plugs 1 and 2

The Power-Up Default String would be defined as "`00111`."

5. Operation

The device connected to the control port must send ASCII characters at the same data rate as the Pow-R-Boot 5+. The unit accepts 8 bits no parity, or 7 bits even or odd parity, but will always answer back at 8 bits, no parity. Access the PRB 5+ as described in **Chapter 4**, step 1. When the command prompt appears, the user may invoke the following commands.

NOTES

Commands are not case-sensitive.

Wait for the command prompt to appear before entering commands. The prompt will not re-appear until the previous command is complete.

If an invalid command or parameter is entered, the PRB 5+ will respond with the "?" message.

1. **Switch Plug(s) On:** To power-on one or all of the five switched plugs, type `/n ON` and press [Enter]. "`n`" is a plug number from 1 to 5 and an asterisk (*) indicates the command should be applied to all plugs.

2. **Switch Plug(s) Off:** To power-off one or all of the five switched plugs, type `/n OFF` and press [Enter]. "`n`" is a plug number from 1 to 5 and an asterisk (*) indicates the command should be applied to all plugs. Note that "`OFF`" can also be entered as "`OF`."

3. **Boot Plug(s):** To initiate a Boot cycle at one or all of the switched plugs, type `/n BOOT` **and press** [Enter]. "`n`" is a plug number from 1 to 5 and an asterisk (*) indicates the command should be applied to all plugs. Note that "`BOOT`" can also be entered as "`B`." The PRB 5+ will display a series of periods (dots) while the Boot cycle is in progress.

4. **Status:** To display the Status Screen, type `/S` and press [Enter].

5. **Enter Parameters:** To define parameters, such as the Location I.D., Power-Up Default, and Plug Labels, type `/P` and press [Enter]. (Refer to **Chapter 4**, step 4.)

6. **Set Plugs to Default:** To set all plugs to the Power-Up Defaults, type `/D` and press [Enter]. Note that if the Default String includes missing or invalid characters, the `/D` command will not function.

7. **Exit:** To exit from command mode, type `/X` and press [Enter].

NOTE

When the `/n ON/OFF/BOOT` command is invoked, the port (n) must be specified by number. The Port Label *cannot* be used to specify the desired port.

ON/OFF/BOOT Examples:

- To switch plug 3 ON, type `/3 ON` and press [Enter].
- To switch all plugs ON, type `/* ON` and press [Enter].
- To switch plug 5 OFF, type `/5 OFF` and press [Enter].
- To switch all plugs OFF, type `/* OFF` and press [Enter].
- To initiate a boot cycle at plug 2, type `/2 BOOT` and press [Enter].
- To initiate a boot cycle at all plugs, type `/* BOOT` and press [Enter].

6. Troubleshooting

6.1 Common Concerns

6.1.1 No Power Output

If the Pow-R-Boot 5+ does not seem to be providing power to one or more of your devices, make sure all of them are actually plugged into the PRB 5+ and are turned ON. Also make sure that the PRB 5+ itself is plugged in. Now turn the PRB 5+ OFF and then ON again using its master power switch.

If this doesn't help, try unplugging the Pow-R-Boot 5+, then unplugging the switched devices from the PRB 5+ and plugging them directly into the AC outlet that the PRB 5+ was plugged into. If any devices still don't seem to get any power, try plugging them into an outlet you know is working. If they get power then, the outlet you were using is probably not working; have it examined by a certified electrician. If they still don't seem to get power, there is probably something wrong with the devices themselves.

If all of the switched devices get power when they are plugged directly into the wall outlet you had the Pow-R-Boot 5+ plugged into, check how much current each of the switched devices is drawing. If any individual device is drawing more than 15 amps, or if all of the devices put together are drawing more than 15 total amps, you might have tripped the PRB 5+'s circuit breaker. If this is the case, unplug the devices connected to the PRB 5+, and then reset the circuit breaker.

After you reset the circuit breaker, or if the circuit breaker has not been tripped, try reducing the current draw to the PRB 5+'s specified limits, then plug everything back in the way it was when you started. If any devices still don't seem to get power, there is probably something wrong with the PRB 5+; call Black Box at 724-746-5500 for technical support.

6.1.2 Unit Does Not Respond to Commands

If the Pow-R-Boot 5+ doesn't seem to carry out the commands you send it, and you are judging this by the fact that you get no electronic responses from the unit, first make sure that both the master device and the PRB 5+ are actually plugged in and turned ON. Then make sure that the cable running from the master device to the PRB 5+ is pinned straight-through and is securely attached at both ends. Also make sure that both the master device and the PRB 5+ are set to the same data rate (see **Section 3.1**), that the master device is actually sending your commands out of the port that is connected to the PRB 5+, and that the master device is sending ASCII in the format of 7 data bits (even or odd parity) or 8 data bits (no parity).

If these checks turn up nothing, make sure that neither the cable nor the master device's serial port are broken (this might require a cable tester and/or an ohmmeter). If these seem OK, call Black Box for technical support.

6.2 Calling Black Box

If you determine that your Pow-R-Boot 5+ is malfunctioning, do not attempt to alter or repair it. Contact Black Box at 724-746-5500. The problem might be solvable over the phone.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- The nature and duration of the problem.
- When the problem occurs.
- The components involved in the problem.
- Any particular application that, when used, appears to create the problem or make it worse.

6.3 Shipping and Packaging

If you need to transport or ship your Pow-R-Boot 5+:

- Package it carefully. We recommend that you use the original container.
- Before you ship a unit for repair or return, contact Black Box to get a Return Materials Authorization (RMA) number, and make sure you include everything you received with the unit when you ship it.