



KRAMER ELECTRONICS LTD.

# USER MANUAL

MODEL:

**RB-6**

6 Channel Power Controller

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P/N: 2900-300024 Rev 2

## RB-6/RB-6(US) Quick Start Guide



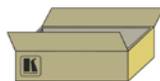
This guide helps you install and use your product for the first time. For more detailed information, go to [http://www.kramerelectronics.com/support/product\\_downloads.asp](http://www.kramerelectronics.com/support/product_downloads.asp) to download the latest manual or scan the QR code on the left.



**Note:** All references to the **RB-6** in this Quick Start Guide apply to both the **RB-6** and **RB-6(US)**.

### Step 1: Check what's in the box

- The **RB-6** 6 Channel Power Controller
- 1 Power cord
- 4 Rubber feet
- 1 Quick start guide
- Rack "ears"
- 1 Null modem adapter

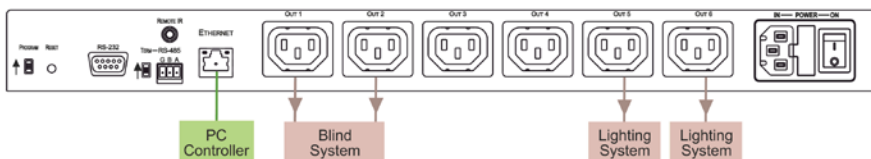


Save the original box and packaging materials in case your Kramer product needs to be returned to the factory for service.

### Step 2: Install the RB-6

Mount the device in a rack (using the rack "ears" provided) or stick the rubber feet to the device and place it on a shelf.

### Step 3: Connect the outputs



Always switch off the power to all devices before connecting them to your **RB-6**.

For best results, we recommend that you use Kramer high-performance cables for connecting equipment to the **RB-6**.

### Step 4: Connect the power

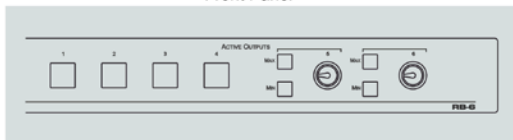
Connect the **RB-6** to the mains electricity and turn the device on.



### Step 5: Operate the RB-6

Operate the device using the front panel buttons, an RS-232/RS-485 serial controller and the Ethernet connection

Front Panel



Rear Panel



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# 1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront video, audio, presentation, and broadcasting professionals on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better!

Our 1,000-plus different models now appear in 11 groups that are clearly defined by function: GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Routers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters and GROUP 11: Sierra Video Products.

Congratulations on purchasing your Kramer **RB-6** *6 Channel Power Controller*, which is ideal for the following typical applications:

- Production studios
- Large multimedia displays
- Home entertainment installations

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## 2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual



Go to [http://www.kramerelectronics.com/support/product\\_downloads.asp](http://www.kramerelectronics.com/support/product_downloads.asp) to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

### 2.1 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables to avoid interference (often associated with low quality cables)
- Do not secure the cables in tight bundles or roll the slack into tight coils
- Position your Kramer **RB-6** away from moisture, excessive sunlight and dust



This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.

### 2.2 Safety Instructions



**Caution:** There are no operator serviceable parts inside the unit

**Warning:** You use only the power cord that is supplied with the unit. Do not open the unit. High voltages can cause electrical shock! Servicing by qualified personnel only

**Warning:** Disconnect the power and unplug the unit from the wall before installing

## 2.3 Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer's recycling arrangements in your particular country go to our recycling pages at <http://www.kramerelectronics.com/support/recycling/>.

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## 3 Overview

The Kramer **RB-6** is a high-performance, high-voltage power supply that supplies power to up to six external units.

The **RB-6** features:

- Two power outlets with on/off push-button as well as full voltage control
- Four power outlets with on/off push-button control
- Individual push-button LEDs to indicate which outlets are live
- Remote control via Ethernet (with built-in Web pages), RS-232 and RS-485
- Availability in European and American versions

The **RB-6** is housed in a 19-inch, 1U, rack-mountable enclosure and is powered by a 100–240V AC universal switching power supply. The **RB-6** is for use in Europe with 220V AC European power sockets and the **RB-6 (US)** is for use in America with 110V AC American power sockets. **RB-6** is printed on the front panel of both models.

### 3.1 Using the IR Transmitter

You can use the **RC-IR3** IR transmitter to control the machine via the built-in IR receiver on the front panel or instead, via an optional external IR receiver (Model: **C-A35M/IRR-50**). The external IR receiver can be located up to 15m (49ft) away from the machine. This distance can be extended to up to 60m (197ft) when used with three extension cables (Model: **C-A35M/A35F-50**).

Before using the external IR receiver be sure to arrange for your Kramer dealer to insert the internal IR connection cable (P/N: 505-70434010-S) with the 3.5mm connector that fits into the REMOTE IR opening on the rear panel. Connect the external IR receiver to the REMOTE IR 3.5mm connector.



## 4 Defining the RB-6 6 Channel Power Controller

Figure 1 defines the RB-6 6 Channel Power Controller.

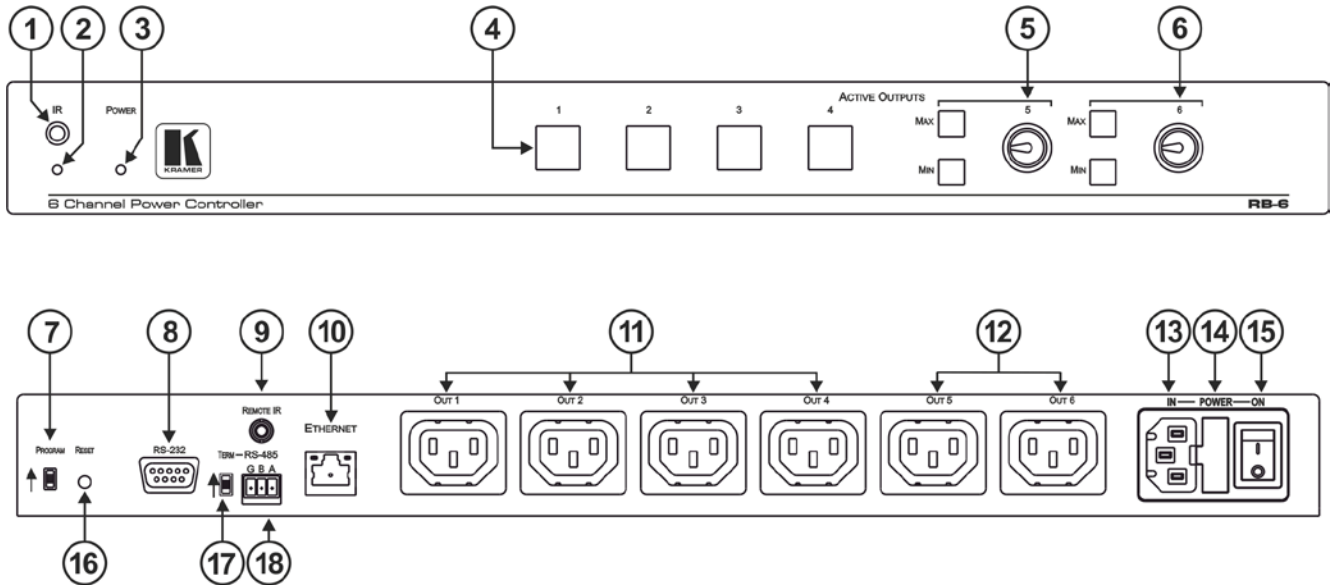


Figure 1: RB-6 6 Channel Power Controller Front and Rear Panels

Figure 2 defines the **RB-6 (US) 6 Channel Power Controller**.

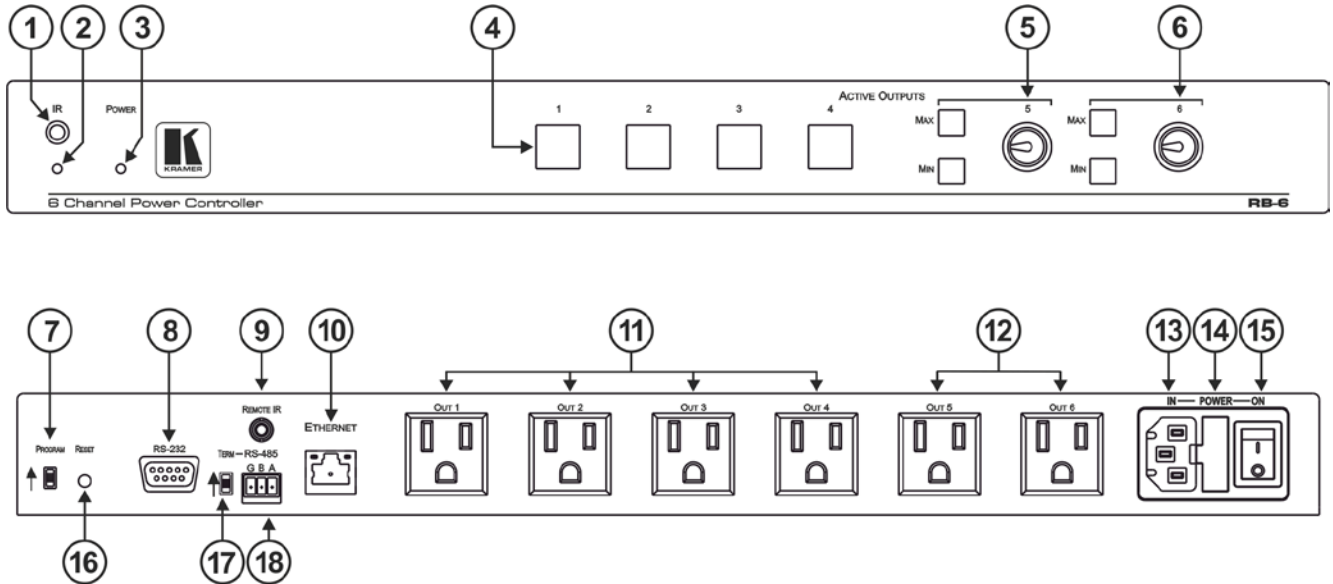


Figure 2: RB-6 (US) 6 Channel Power Controller Front and Rear Panels

The following table refers to both [Figure 1](#) and [Figure 2](#).

#	Feature	Function	
1	IR Receiver	Infrared remote control sensor	
2	IR LED	Lights yellow when receiving commands from the IR remote control transmitter	
3	POWER LED	Lights green when the device is powered on	
4	ACTIVE OUTPUTS Buttons (1 to 4)	Press a button to turn on the output. The relevant button LED lights red. Press the button again to turn the output off. The button LED no longer lights	
5	ACTIVE OUTPUTS 5 Controls	MAX	Press to set the output voltage to maximum. Press and hold to set the current setting as the maximum voltage
		MIN	Press to set the output voltage to minimum. Press and hold to set the current setting as the minimum voltage
		Rotary control	Turn clockwise to increase or anti-clockwise to decrease the output voltage
6	ACTIVE OUTPUTS 6 Controls	MAX	Press to set the output voltage to maximum. Press and hold to set the current setting as the maximum voltage
		MIN	Press to set the output voltage to minimum. Press and hold to set the current setting as the minimum voltage
		Rotary control	Turn clockwise to increase or anti-clockwise to decrease the output voltage
7	PROGRAM Switch	For the use of Kramer service personnel only	
8	RS-232 9-pin D-sub Connector (F)	Connect to an RS-232 controller, such as a PC (see <a href="#">Section 6.3</a> )	
9	REMOTE IR 3.5mm Opening	For installing the optional external IR receiver 3.5mm mini jack (see <a href="#">Section 3.1</a> )	
10	ETHERNET RJ-45 Connector	Connect to a remote PC controller over a LAN (see <a href="#">Section 6.2</a> )	
11	OUT 1–4 Power Sockets	Plug in devices to be controlled only on and off	
12	OUT 5–6 Power Sockets	Plug in devices to be controlled on/off, and a dimming function using the minimum/maximum rotary controls (see 5 and 6)	
13	IN—POWER—ON	Power Socket	Connect to the mains power
14		Mains Fuse	Fuse for protecting the RB-6
15		Mains Switch	Switch for turning the device on and off
16	RESET Switch	Press and hold while turning power on to reset the device to factory default condition	
17	TERM RS-485 Switch	Push up to terminate the RS-485 bus (see <a href="#">Section 6.4</a> )	
18	RS-485 3-pin Terminal Block	Connect to a controller equipped with an RS-485 port (see <a href="#">Section 6.4</a> )	

## 5 Installing in a Rack

**Before installing in a rack**, be sure that the environment is within the recommended range:

OPERATING TEMPERATURE:	0° to +40°C (32° to 104°F)
STORAGE TEMPERATURE:	-40° to +70°C (-40° to 158°F)
HUMIDITY:	10% to 90%, RHL non-condensing



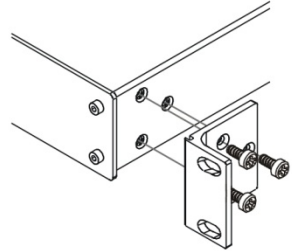
### CAUTION!

When installing on a 19" rack, avoid hazards by taking care that:

1. It is located within the recommended environmental conditions, as the operating ambient temperature of a closed or multi unit rack assembly may exceed the room ambient temperature.
2. Once rack mounted, enough air will still flow around the machine.
3. The machine is placed straight in the correct horizontal position.
4. You do not overload the circuit(s). When connecting the machine to the supply circuit, overloading the circuits might have a detrimental effect on overcurrent protection and supply wiring. Refer to the appropriate nameplate ratings for information. For example, for fuse replacement, see the value printed on the product label.
5. The machine is earthed (grounded) in a reliable way and is connected only to an electricity socket with grounding. Pay particular attention to situations where electricity is supplied indirectly (when the power cord is not plugged directly into the socket in the wall), for example, when using an extension cable or a power strip, and that you use only the power cord that is supplied with the machine.

### To rack-mount a machine:

1. Attach both ear brackets to the machine. To do so, remove the screws from each side of the machine (3 on each side), and replace those screws through the ear brackets.



2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

#### Note:

- In some models, the front panel may feature built-in rack ears
- Detachable rack ears can be removed for desktop use
- Always mount the machine in the rack before you attach any cables or connect the machine to the power
- If you are using a Kramer rack adapter kit (for a machine that is not 19"), see the Rack Adapters user manual for installation instructions available from our Web site

## 6 Connecting the RB-6



Always switch off the power to all devices before connecting them to your **RB-6**. After connecting your **RB-6**, connect its power and then switch on the power to each device.

### 6.1 Connecting Devices to the RB-6

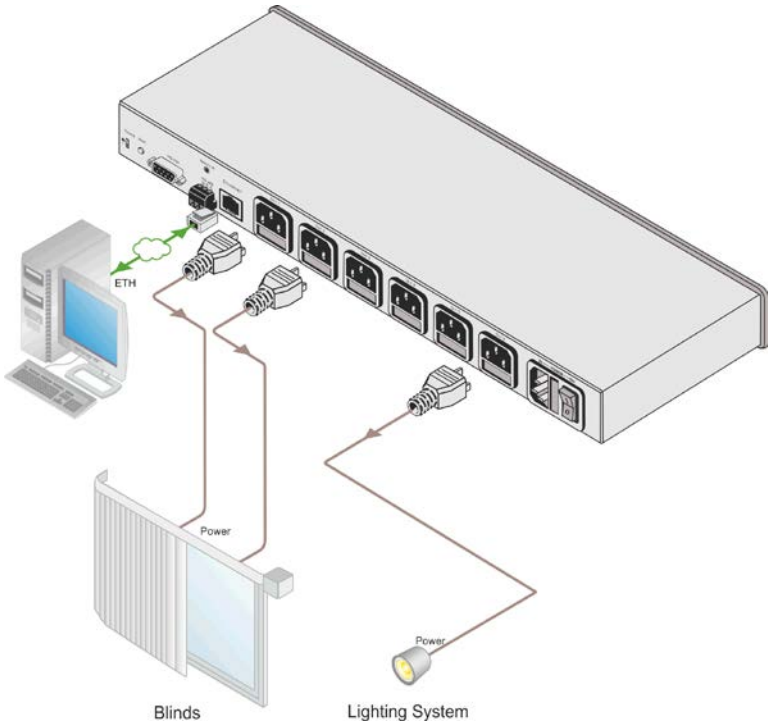


Figure 3: Connecting to the RB-6 Rear Panel

To connect the RB-6 as illustrated in the example in [Figure 3](#):

1. Connect a device, (for example, a blind system) to power outlet 1 for open and to power outlet 2 for close control.
2. Connect a device, (for example, a lighting system) to power outlet 6 for on/off control and a dimming function.

3. Optional—connect a PC via Ethernet over a LAN to the **RB-6** for remote control.

## 6.2 Connecting to the RB-6 via Ethernet

You can connect the **RB-6** via Ethernet using a crossover cable (see [Section 6.2.1](#)) for direct connection to the PC, or a straight through cable (see [Section 6.2.2](#)) for connection via a network hub or network router.

After connecting the Ethernet port, you have to install and configure your Ethernet Port. For detailed instructions, see the Ethernet Configuration Guide (Lantronix) in the technical support section on our Web site <http://www.kramerelectronics.com>

### 6.2.1 Connecting the Ethernet Port directly to a PC

You can connect the Ethernet port on the **RB-6** to the Ethernet port on your PC via a crossover cable with RJ-45 connectors.

This type of connection is recommended for identification of the factory default IP Address of the **RB-6** during the initial configuration

#### To configure your PC after connecting the Ethernet port:

1. Right-click the **My Network Places** icon on your desktop.
2. Select **Properties**.
3. Right-click **Local Area Connection Properties**.
4. Select **Properties**.  
The **Local Area Connection Properties** window appears.
5. Select the **Internet Protocol (TCP/IP)** and click the **Properties** Button.

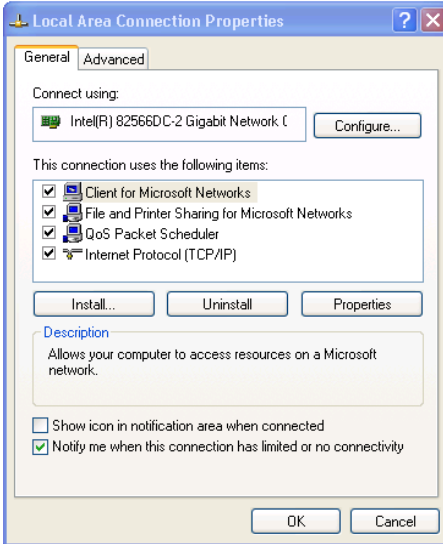


Figure 4: Local Area Connection Properties Window

6. Select **Use the following IP Address** and enter the details as shown in [Figure 5](#). You can use any IP address in the range 192.168.1.1 to 192.168.1.255 (excluding 192.168.1.39) that is provided by your IT department.

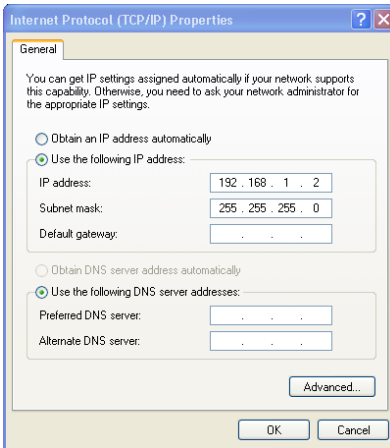


Figure 5: Internet Protocol (TCP/IP) Properties Window

7. Click **OK**.

## 6.2.2 Connecting to the Ethernet Port via a Network Switch/Hub

To connect to the Ethernet port on the RB-6 via a network switch/hub:

- Connect the PC to the Ethernet network switch/hub using a straight through cable

## 6.2.3 Initial Ethernet Port Configuration

To initially configure the Ethernet port, download the K-Upload Ethernet configuration software.

The K-Upload Ethernet configuration software is available from <http://www.kramerelectronics.com>.

Extract the file to a folder and create a shortcut on your desktop to the file.

To configure the Ethernet port initially:

1. Double-click the desktop icon.

The **K-Upload** screen appears as shown in [Figure 6](#).

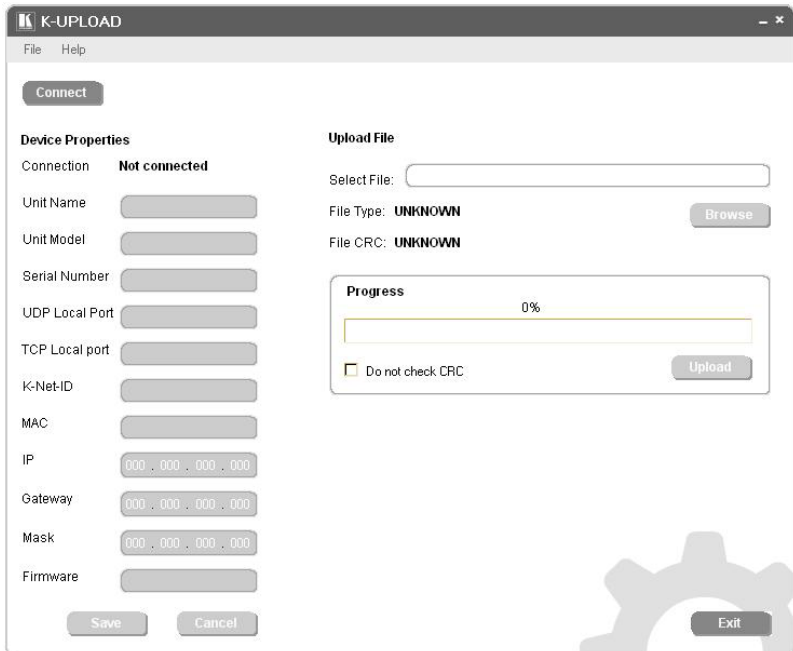


Figure 6: K-Upload Main Screen



2. Click the **Connect** button.

The **Connect** screen appears as shown in [Figure 7](#).

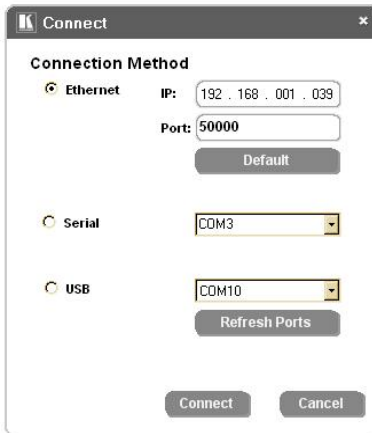


Figure 7: Connect Screen

3. Connect a USB cable from a USB port on the PC to the USB port on the **RB-6** (you can also connect to the PC via the Ethernet or a serial connector).
4. Select USB as the connection method.
5. Select the com port from the USB drop-down list.
6. Click **Connect**.

The **Device Properties** screen appears as shown in [Figure 8](#).

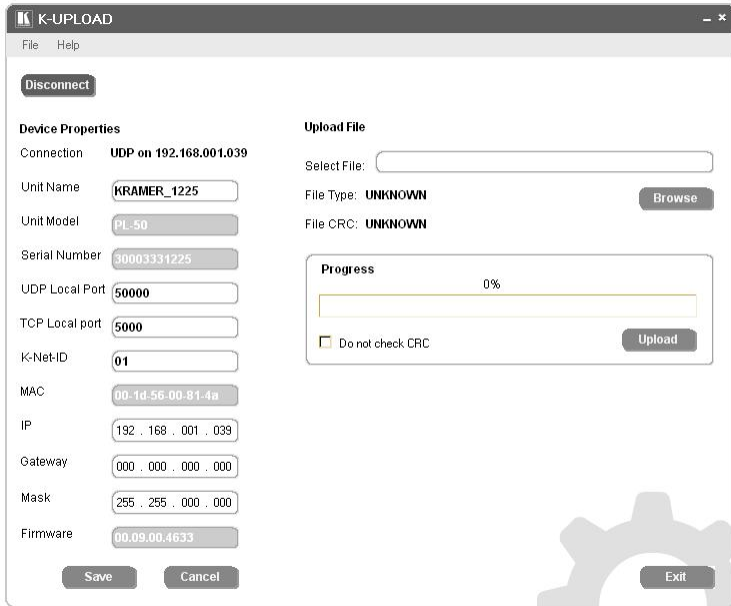


Figure 8: Device Properties Screen

7. Change the parameters as required.
8. To save the changes, click **Save**. To exit without saving the changes, click **Exit**.

**Note:** After changing the ETH port settings (IP address or port), restart the **RB-6**.

## 6.3 Connecting to the RB-6 via RS-232

You can connect to the unit via a crossed RS-232 connection, using for example, a PC. A crossed cable or null-modem is required as shown in method A and B respectively. If a shielded cable is used, connect the shield to pin 5.

**Method A (Figure 9)**—Connect the RS-232 9-pin D-sub port on the unit via a crossed cable (only pin 2 to pin 3, pin 3 to pin 2, and pin 5 to pin 5 need be connected) to the RS-232 9-pin D-sub port on the PC.

**Note:** There is no need to connect any other pins.

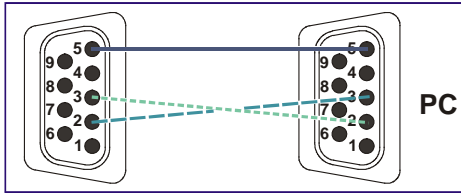


Figure 9: Crossed Cable RS-232 Connection

Hardware flow control is not required for this unit. In the rare case where a controller requires hardware flow control, short pin 1 to 7 and 8, and pin 4 to 6 on the controller side.

**Method B** (Figure 10)—Connect the RS-232 9-pin D-sub port on the unit via a straight (flat) cable to the null-modem adapter, and connect the null-modem adapter to the RS-232 9-pin D-sub port on the PC. The straight cable usually contains all nine wires for a full connection of the D-sub connector. Because the null-modem adapter (which already includes the flow control jumpering described in Method A above) only requires pins 2, 3 and 5 to be connected, you are free to decide whether to connect only these 3 pins or all 9 pins.

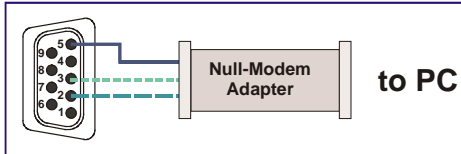


Figure 10: Straight Cable RS-232 Connection with a Null Modem Adapter

## 6.4 Connecting a PC or Controller to the RS-485 Port

You can operate the **RB-6** via the RS-485 port from a distance of up to 1200m (3900ft) using any device equipped with an RS-485 port (for example, a PC). For successful communication, you must set the RS-485 machine number and bus termination.

The first and last device on the RS-485 bus must be terminated. All other devices must remain unterminated. Move the switch up to terminate and down to unterminate.

**Note:** You cannot perform a firmware upgrade using the RS-485 port.

**To connect a device with a RS-485 port to the RB-6:**

- For the first and last device on the RS-485 bus, set the RS-485 bus termination switch (up to terminate)
- Connect the A (+) pin on the RS-485 port of the PC to the A pin on the RS-485 port on the rear panel of the **RB-6**
- Connect the B (-) pin on the RS-485 port of the PC to the B pin on the RS-485 port on the rear panel of the **RB-6**
- Connect the G pin on the RS-485 port of the PC to the G pin on the RS-485 port on the rear panel of the **RB-6**

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## 7 Operating the RB-6 Locally

It is good working practice to turn off unused outputs.

### 7.1 Operating the RB-6 via the Front Panel Buttons

#### To operate outputs 1 to 4:

1. Press the required button to turn the output on.  
The output is turned on and the relevant button LED lights.
2. Press the required button again to turn the output off.  
The output is turned off and the button LED no longer lights.

#### To vary the voltage on outputs 5 and 6:

- Turn the relevant output control knob clockwise to increase or anticlockwise to decrease the output voltage.  
The button LED flashes for a few seconds when the maximum or minimum limit is reached, then lights solid

#### To set the output voltage to the minimum or maximum voltage on outputs 5 and 6:

- Briefly press the relevant Min or Max button to set the output voltage to the minimum or maximum output respectively.  
The button LED flashes

#### To configure the lower and upper ranges for outputs 5 and 6:

- With the output voltage already set to the required minimum or maximum (percentage), press and hold either the Min or Max button for a few seconds to configure that voltage as the minimum or maximum respectively.  
The button LED lights solid

**To reset the lower and upper ranges for outputs 5 and 6 to the default values of 0% and 100%:**

- Press and hold both the Min and Max buttons of the relevant output at the same time.  
The minimum is set to 0% and the maximum is set to 100% and the button LED no longer lights

**Note:** When a Max or Min button LED is not lit it indicates that the settings are the default values. When a Max or Min button LED lights it indicates that there is a custom setting.

## 7.2 Resetting the RB-6 to Factory Defaults

**To reset the device to factory defaults:**

1. Turn the device off.
2. Press and hold the Reset button on the rear panel of the device, (see [Figure 1](#)).
3. While holding the button depressed, turn the device on.
4. Wait a few seconds and release the button.  
The configuration is reset to the factory default (see [Section 11](#)).

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# 8 Operating the RB-6 Remotely Using the Web Pages

## 8.1 Accessing the RB-6 Embedded Web Pages

The embedded Web pages can be used to remotely operate the **RB-6** via a LAN using the Ethernet connection (see [Section 6.2](#)).

Before you can use the embedded Web pages, check that the Java™ software is installed on your computer and that your computer is correctly connected to the **RB-6** via the Ethernet connection (see [Section 6.2](#)).

The Java software is available from <http://www.java.com>.

A description of each Web page appears if you hover with your mouse over the question mark that appears on the left side of the screen.

**To run the RB-6 embedded Web pages:**

1. Open your Internet browser.
2. Type the IP address (see [Section 11](#)) of the **RB-6** in the address bar of your browser (or the name, if using DHCP).



Figure 11: Entering the IP Address in your Browser

The screen shown in [Figure 12](#) appears.

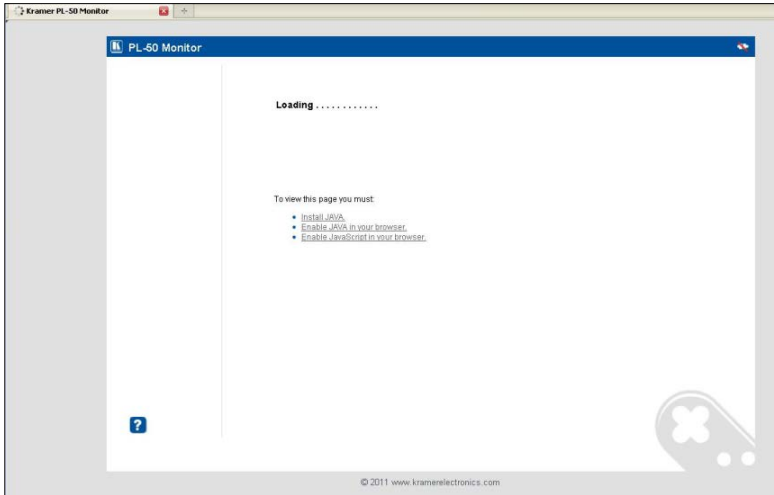


Figure 12: Loading the Embedded Web Pages

Check that Java and JavaScript is enabled in your browser. The security warning shown in [Figure 13](#) appears.



Figure 13: Security Warning

3. Click **Run**.

The **RB-6 Panel** page appears with the menu on the left side of the screen.



## 8.2 The Panel Page

Using the **Panel** page (Figure 14), you can turn on and off Outputs 1 to 4, and adjust the voltage on Outputs 5 and 6.

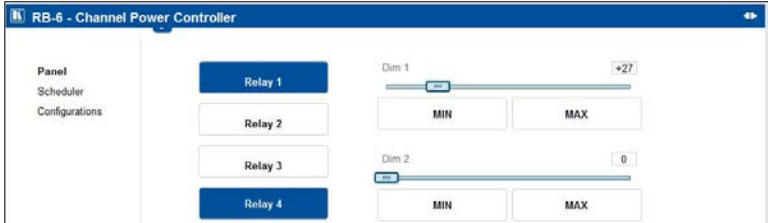




Figure 14: Panel Page

The connection icon in the top right corner of the screen indicates whether the device is currently connected to your PC  or is not connected .

### To turn an output on:

- Click the required white output Relay button.  
The relay is turned on and the button changes to purple

### To turn an output off:

- Click the required purple output Relay button.  
The relay is turned off and the button changes to white

### To change the voltage on Output 5 or 6:

1. Click and hold on the required slider.
2. Drag the slider to the right to increase the voltage, or to the left to decrease the voltage.

### To set the voltage on Output 5 or 6 to minimum or maximum:

- Set the output voltage using the sliders
- Click on the required Min or Max button.  
The output voltage is set to the minimum or maximum and the button changes to purple

### 8.3 The Scheduler Page

Using the **Scheduler** page ([Figure 15](#)), you can schedule operation of the outlets on a weekly basis.

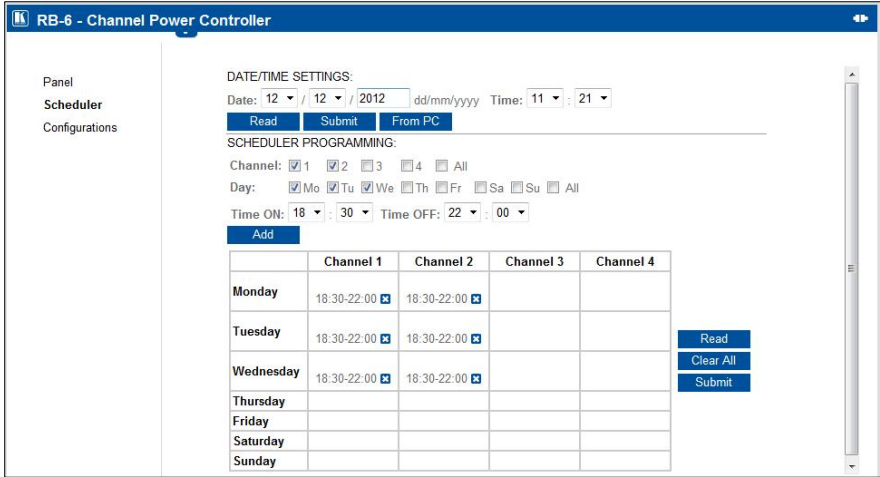


Figure 15: The Scheduler Page

Feature	Function
DATE/TIME SETTINGS	<p>Sets the current date and time.</p> <p>Click Read to read the device settings.</p> <p>Click Submit to write the current settings to the device.</p> <p>Click From PC to acquire the date and time from your PC</p>
SCHEDULER PROGRAMMING	<p>Select one or more channels for scheduling.</p> <p>Select the day or days of the week for scheduling.</p> <p>Select the time schedule for the selected channel(s): the Time ON and the Time OFF.</p> <p>Click Add to add the schedule for the selected channel(s).</p> <p>Click Read to read the current schedule stored in the machine (the schedule from the device overwrites the schedule on the Web page).</p> <p>Click Clear All to clear the scheduling table (this only clears the schedule on the Scheduler page, not the device).</p> <p>Click on the X alongside a scheduled time to delete the entry.</p> <p>Click Submit to save the current scheduling table to the device</p>

To schedule channels, days and times as shown in [Figure 15](#):

1. In the Date/Time Settings, click Read to check that the date and time on the device is correct.

2. Under Scheduler Programming,
  - Select channels 1 and 2 by clicking on their respective check-boxes
  - Select Mo, Tu and We by clicking on their respective check-boxes
  - Set the Time On and Time Off using the drop-down lists
3. Click Add to add this schedule to the table.
4. Click Submit to write the schedule to the device.

## 8.4 The Configurations Page

Using the **Configurations** page ([Figure 16](#)), you can change some parameters (the device name, IP address/DHCP, gateway and subnet mask), as well as view others (model, serial number, firmware version and MAC address).

Panel	Name:	KRAMER_7890
Scheduler	Model:	RB-6
Configurations	Serial Number:	1234567890
	Firmware version:	00.01.00.7224
	MAC Address:	##-##-##-##-##-##
	IP Address:	192.168.001.039
	DHCP:	<input type="checkbox"/>
	Gateway:	000.000.000.000
	Subnet Mask:	255.255.000.000
		<input type="button" value="Submit"/> <input type="button" value="Cancel"/>

Figure 16: The Configurations Page

### To change configuration settings:

1. Change the parameters as required.
2. Click Submit to write the changes to the device, or click Cancel to lose any changes made and return to the Panel page.  
If you click Submit, a warning appears asking if you are sure you want to change the network settings.
3. Click Yes.  
A window appears announcing that the configuration has been successfully changed.

4. Click OK.
5. If the IP address was changed, communication with the device is lost.  
Restart the **RB-6** and reload the Web page with the new address.

---

## 9 Firmware Update

For instructions on updating the firmware of the **RB-6**, refer to the **K-Upload Software Guide** (available for download from <http://www.kramerelectronics.com>).

**Note:** You cannot perform a firmware upgrade using the RS-485 port.

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## 10 Technical Specifications

INPUTS:	1 x Power input
OUTPUTS:	6 x Controllable power outputs
CONTROL:	Front panel buttons, IR remote control, RS-232 on a 9-pin D-sub connector, RS-485 on a 3-pin terminal block, Ethernet on an RJ-45 connector
INPUT POWER SOURCE:	Europe: 220-240V AC, 50/60Hz, 10VA, internal USA: 100-120V AC, 50/60Hz, 10VA, internal
OUTPUTS:	Europe: 5 x 220-240V AC outputs, total load of 10A Max. USA: 5 x 100-120V AC outputs, total load of 10A Max.
MAXIMUM LOAD:	10A total, 6A per socket
OPERATING TEMPERATURE:	0° to +40°C (32° to 104°F)
STORAGE TEMPERATURE:	-40° to +70°C (-40° to 158°F)
HUMIDITY:	10% to 90%, RHL non-condensing
DIMENSIONS:	19" (W), 9.3" (D) 1U (H) rack mountable
WEIGHT:	1.8kg (3.97lbs) approx.
ACCESSORIES:	Rack "ears", IR remote control, null modem adapter, power cord
OPTIONS:	Remote IR receiver cable Kramer P/N 505-70434010-S
Specifications are subject to change without notice at <a href="http://www.kramerelectronics.com">http://www.kramerelectronics.com</a>	

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## 11 Default Communication Parameters

RS-232	
Baud Rate:	115000
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	Hex
Example (Output 1 to Input 1):	0x01, 0x81, 0x81, 0x81
Ethernet	
IP Address:	192.168.1.39
TCP Port Number:	5000
Network Mask:	255.255.255.0
Default Gateway:	192.168.1.1

## 12 RB-6 Communication Protocol

The **RB-6** supports Kramer Protocol 3000.



Go to our Web site at <http://www.kramerelectronics.com> to check for the latest **RB-6** communication protocol.

With Kramer Protocol 3000 you can control a device from any standard terminal software (for example, the Windows® HyperTerminal Application).

This RS-232/RS-485 communications protocol uses a data rate of 115,200 baud, no parity, 8 data bits and 1 stop bit.

### 12.1 Syntax

#### 12.1.1 Host Message Format

Start	Address (optional)	Body	Delimiter
#	Destination_id@	Message	CR

##### 12.1.1.1 Simple Command

Command string with only one command without addressing:

Start	Body	Delimiter
#	Command SP Parameter_1,Parameter_2,...	CR

##### 12.1.1.2 Command String

Formal syntax with commands concatenation and addressing:

Start	Address	Body	Delimiter
#	Destination_id@	Command_1 Parameter1_1,Parameter1_2,...  Command_2 Parameter2_1,Parameter2_2,...  Command_3 Parameter3_1,Parameter3_2,... ...	CR

##### 12.1.2 Device Message Format

Start	Address (optional)	Body	delimiter
~	Sender_id@	Message	CR LF



### 12.1.2.1 Device Long Response

Echoing command:

Start	Address (optional)	Body	Delimiter
~	Sender_id@	Command <b>SP</b> [Param1 ,Param2 ...] <b>result</b>	<b>CR</b> <b>LF</b>

**CR** = Carriage return (ASCII 13 = 0x0D)

**LF** = Line feed (ASCII 10 = 0x0A)

**SP** = Space (ASCII 32 = 0x20)

### 12.1.3 Command Terms

#### Command

A sequence of ASCII letters ('A'-'Z', 'a'-'z' and '-').

Command and parameters must be separated by at least one space.

#### Parameters

A sequence of alphanumeric ASCII characters ('0'-'9', 'A'-'Z', 'a'-'z' and some special characters for specific commands). Parameters are separated by commas.

#### Message string

Every command entered as part of a message string begins with a **message starting character** and ends with a **message closing character**.

**Note:** A string can contain more than one command. Commands are separated by a pipe ( '|') character.

#### Message starting character

'#' – For host command/query

'~' – For machine response or machine command performed by keystroke operation on the front panel or IR remote controller.

**Device address** (Optional when directly connected to the device)

K-Net Device ID or MACHINE NUMBER followed by '@'

(ex. #02@**CRLF**)

#### Query sign

'?' follows some commands to define a query request.

## All outputs sign

'\*' defines all outputs.

## Message closing character

**CR** – For host messages; carriage return (ASCII 13)

**CRLF** – For machine messages; carriage return (ASCII 13) + line-feed (ASCII 10)

## Command chain separator character

When a message string contains more than one command, a pipe ( '|' ) character separates each command.

Spaces between parameters or command terms are ignored.

### 12.1.4 Entering Commands

You can directly enter all commands using a terminal with ASCII communication software, such as HyperTerminal, Hercules, etc. Connect the terminal to the serial, Ethernet, or USB port on the Kramer device. To enter **CR**, press the Enter key. (**LF** is also sent but is ignored by the command parser).

For commands sent from some non-Kramer controllers like Crestron, some characters require special coding (such as, /X##). Refer to the controller manual.

### 12.1.5 Bi-directional Definition

All commands are bi-directional. That is, if the device receives the code, it will perform the instruction; and if the instruction is performed (due to a keystroke operation on the front panel or IR controller), then these codes are sent to the PC or other RS-232 / Ethernet / USB controller.

### 12.1.6 Command Forms

Some commands have short name syntax in addition to long name syntax to allow faster typing. The response is always in long syntax.

### 12.1.7 Command Chaining

Multiple commands can be chained in the same string. Each command is delimited by a pipe character ( '| ' ). When chaining commands, enter the **message starting character** and the **message closing character** only once, at the beginning of the string and at the end.

Commands in the string do not execute until the closing character is entered. A separate response is sent for every command in the chain.

### 12.1.8 Maximum String Length

64 characters

### 12.1.9 Backward Support

Protocol 2000 is transparently supported by Protocol 3000. You can switch between protocols using a switch protocol command from either platform.

## 12.2 Supported Commands

For details regarding the commands, see the Kramer Protocol 3000 document. The latest version of the document is available from <http://www.kramerelectronics.com>.

The following commands are supported by the **RB-6**.

Command	Description	Permission
#	Protocol handshaking	End User
BUILD-DATE?	Read device build date	End User
DIM_RANGE	Set the dimmer range	
DIM_RANGE?	Read the dimmer range	
DIM-VALUE	Set the dimmer value	
DIM-VALUE?	Read the dimmer value	
ETH-PORT	Change protocol Ethernet port	Administrator
ETH-PORT?	Get protocol Ethernet port	End User
FACTORY	Reset to factory default configuration	
HELP	List of commands	End User
LDFW	Load new firmware	User SW Internal
MODEL?	Read device model	End User
NAME	Set machine (DNS) name	Administrator
NAME?	Get machine (DNS) name	End User
NAME-RST	Reset machine name to factory default (DNS)	Administrator
NET-DHCP	Set DHCP mode	Administrator

Command	Description	Permission
NET-DHCP?	Get DHCP mode	End User
NET-GATE	Set Gateway	Administrator
NET-GATE?	Get Gateway	End User
NET-IP	Set IP address	Administrator
NET-IP?	Get IP address	End User
NET-MAC?	Read MAC address	End User
NET-MASK	Set subnet mask	Administrator
NET-MASK?	Get subnet mask	End User
PROT-VER?	Read device protocol version	End User
RELAY	Relay control	End User
RELAY?	Relay control	End User
RESET	Reset device	Administrator
SN?	Read device serial number	End User
UPGRADE	Execute firmware upgrade	Administrator
VERSION?	Read device firmware version	End User

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**SAFETY WARNING**

Disconnect the unit from the power supply before opening and servicing



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