

RK-3

In-Wall Universal Controller



RK-3

Operation & Installation Guide

v1.0



FEDERAL COMMUNICATIONS COMMISSION NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, 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, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation 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.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

SAFETY SUGGESTIONS

Read Instructions. Read all safety and operating instructions before operating the unit.

Heat. Keep the unit away from heat sources such as radiators, heat registers, stoves, etc., including amplifiers that produce heat.

Power Sources. Connect the unit only to an RTI approved power supply.

Power Cord Protection. Route power supply cords so that they are not likely to be walked on or pinched by items placed on or against them, paying particular attention to the cords at power receptacles and at the point at which they exit from the unit.

Nonuse Periods. Unplug the power supply from the outlet when the unit is to be left unused for a long period.

Water and Moisture. Do not use the unit near water—for example, near a sink, in a wet basement, near a swimming pool, near an open window, etc.

Object and Liquid Entry. Do not allow objects to fall or liquids to be spilled into the enclosure through openings.

Cleaning. The unit should be cleaned only as recommended in the operating guide.

Servicing. Do not attempt any service beyond that described in the operating guide. Refer all other service needs to qualified service personnel.

Damage Requiring Service. The unit should be serviced by qualified service personnel when:

- The power supply cord or the plug has been damaged.
- Objects have fallen or liquid has been spilled into the unit.
- The unit does not appear to operate normally or exhibits a marked change in performance.

LIMITED WARRANTY

Remote Technologies Incorporated warrants its products for a period of one (1) year from the date of purchase from Remote Technologies Incorporated or an authorized Remote Technologies Incorporated distributor.

This warranty may be enforced by the original purchaser and subsequent owners during the warranty period, so long as the original dated sales receipt or other proof of warranty coverage is presented when warranty service is required.

Except as specified below, this warranty covers all defects in material and workmanship in this product. The following are not covered by the warranty:

Damage resulting from:

1. Accident, misuse, abuse, or neglect.
2. Failure to follow instructions contained in this Guide.
3. Repair or attempted repair by anyone other than Remote Technologies Incorporated.
4. Causes other than product defects, including lack of skill, competence or experience of user.
5. Shipment of this product (claims must be made to carrier).
6. Being altered or which the serial number has been defaced, modified or removed.

Remote Technologies Incorporated is not liable for any damages caused by its products or for its failure of its products to perform, including any lost profits, lost savings, incidental damages, or consequential damages.

Remote Technologies Incorporated is not liable for damages based upon inconvenience, loss of use of the product, loss of time, interrupted operation, commercial loss, any claim made by a third party or made by you for a third party.

Remote Technologies Incorporated's liability for any defective product is limited to repair or replacement of the product, at our option.

If your RK-3 needs service, please contact Remote Technologies Incorporated by telephone, fax or e-mail for return information.

Please do not return products to RTI without return authorization.

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Chapter 1. Welcome

Thank you for purchasing the *RK-3* in-wall universal controller. The *RK-3* is an advanced universal system controller that mounts in a wall. Its design maintains the perfect balance between a customizable touchpanel and frequently used hard buttons. At 3.5 inches the LCD is small enough to blend into a room's interior, yet it provides a generous $\frac{1}{4}$ -VGA resolution allowing it to display video windows and web pages. The *RK-3* interface is fully programmable using RTI's TheaterTouch Designer™ software, making it easy to display custom buttons, text, graphics, and animations.

The *RK-3* can directly control almost any audio/video component, lighting system, etc. up to 1000 feet away using its infrared output port. In addition, the built-in Ethernet port allows the *RK-3* to display video from network security cameras, access the Internet, view and play songs stored on hard drive music servers, and control other devices on the network.

Programming is easy and convenient thanks to the Windows® based TheaterTouch Designer™ software. Because RTI's remote control products are sold only through professional installers/programmers, and never directly to consumers, it is our philosophy to not incorporate programming capability directly into our products. Instead, we are committed to providing our dealers with the hardware and software tools that allow them to create re-usable programming databases and templates in the most efficient and reliable way possible.

The *RK-3* can be used as a stand-alone device or as part of an expandable central control system. When used with the available RTI accessory devices, the *RK-3* is capable of infrared routing, relay control, power sensing, and RS -232 communications for advanced control.

COMPATIBILITY NOTE

The *RK-3* and *TheaterTouch Designer* software are compatible with infrared (IR) commands with carrier frequencies between 15KhZ and 460KhZ, as well as those commands that do not use a carrier. This covers virtually all of the remotes that exist to date.

UNPACKING AND INSPECTION

After unpacking your new *RK-3* universal system controller, save all of the packing materials in case you ever have to ship the unit.

Thoroughly inspect the *RK-3* and packing materials for signs of damage. Report any damage to the carrier immediately. Report any equipment malfunctions to Remote Technologies Incorporated or an authorized Remote Technologies Incorporated distributor.

PRODUCT CONTENTS

Contents within the box include the following items:

- One (1) *RK-3* universal system controller
- One (1) Cut-out template
- Two (2) Spare retrofit mounting wings
- One (1) Operation & Installation guide

SOFTWARE REQUIREMENTS

The recommended minimum system requirements needed to run the *TheaterTouch Designer* software are as follows:

- Windows 98SE®, Windows ME®, Windows 2000®, Windows XP® or later version.
- A free USB port.
- At least 64 Megabytes of RAM.
- At least 100 Megabytes of free disk storage.

Chapter 2. Introduction

FEATURES

The *RK-3* provides superior quality and reliability as well as these specific features:

- Stylish low-profile faceplate with integrated attachment latches.
- Integrated mounting wings for easy installation.
- Full color TFT LCD to display custom buttons, text, graphics, animations, and video.
- Integrated 10/100Base-T Ethernet port.
- Adjustable backlight brightness.
- Light sensor for automatic backlight level.
- Mono speaker.
- Plasma friendly Infrared receiver for command pass-through.
- IR output port drives up to 1000 feet of wire.
- Two power status input ports.
- Completely customizable, programmable, and upgradeable.
- Optional 'Voltage' and 'Video' power sensing modules.
- Optional interface for RS-232 controlled equipment.
- Non-volatile Flash memory stores your program even when power is lost.
- Easy-to-use Windows based software for programming and customization.
- Field upgradeable firmware.
- USB Programming.

IMPORTANT NOTES

Please read these important notes about the *RK-3*:

- The *RK-3* should be placed in an area where it is around normal room temperature (between 60°F to 90°F). If the temperature is too hot, the display appears dim. If the temperature is too cold, the display appears dark and may respond slowly.
- Avoid installing the *RK-3* in a location where it can come in contact with direct sunlight.
- Do not install the *RK-3* directly adjacent to thermostats. Heat generated by the *RK-3* may effect temperature measurement.
- Do not use sharp objects on the touchscreen. It is designed to operate with a touch of your finger.
- Do not let the *RK-3* get wet. It should not be handled with wet hands or placed in an area where it could get wet.
- Do not subject the *RK-3* to smoke, dust, or vibrations. The display may be damaged from excessive shock or vibration.
- Only use the power supply that is specified for the *RK-3*. Using the wrong type of power supply may result in damage.
- Do not disassemble the unit. Service of the *RK-3* should be performed by authorized personnel only.

CLEANING

Occasional cleaning may be required, depending on use. It is recommended that you create a “Clean” button somewhere on the Home page of the *RK-3*. This button should link to a page that does not contain commands or macros that could be inadvertently executed while cleaning the unit.

To clean your *RK-3*, lightly dampen a lint-free cloth with a glass cleaner or mild detergent, and wipe the touchscreen and surrounding display bezel.

GETTING STARTED

The *RK-3* is turned-on by simply applying power to it. RTI provides two power supply solutions which are sold separately:

Single Unit Power Supply

- 16VDC, 1.6Amp
- Provides power for up to four *RK-3*'s
- Part Number: **40-210285-22**

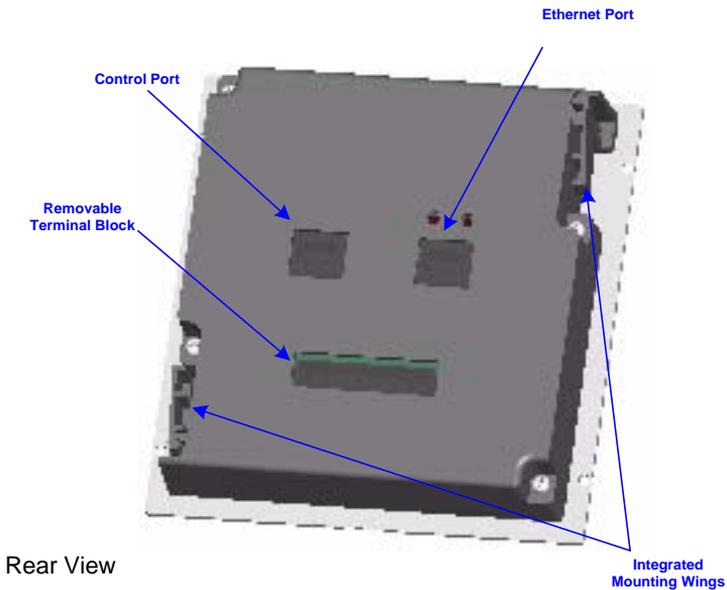
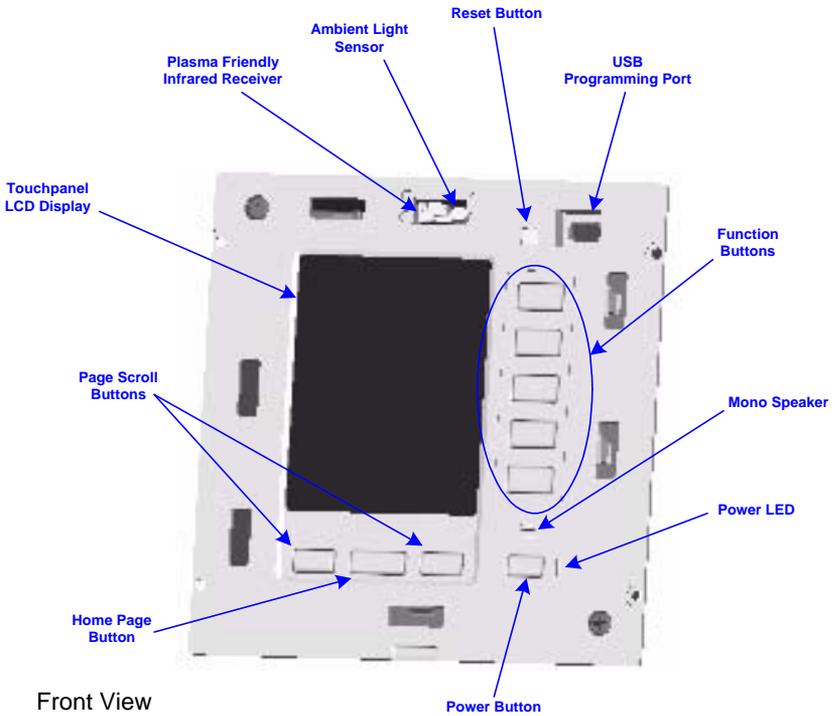
CB-4 Connecting Block

- Includes 16VDC, 4.3Amp power supply
- Provides power for up to twelve *RK-3*'s
- Provides a convenient connection hub
- Part Number: **10-210052-11**

After power is applied, the *RK-3* will take approximately ten seconds to load the operating system, the application software, and the user program. This long delay only occurs from a power-down state. During normal use the *RK-3* turns-on instantly from its sleep mode.

After powering down, the *RK-3* is activated by touching any area of the touchpanel display.

REMOTE REFERENCE



Chapter 3. Operation

THE TOUCHSCREEN DISPLAY

The *RK-3* touchscreen display is organized into a series of pages. Normally each page contains objects (buttons, text, graphics, etc.) that are related in some way. For instance, they may all display information necessary for controlling a particular CD player.

By default, the *RK-3* has one *Home* page—all other pages are normally accessed from links on the Home page. In addition, any page can contain buttons with a link to any other page.

Normally the Home page is used to display the names of the A/V sources and other devices being controlled. The *RK-3* will support 200 pages including the Home page.

A representation of a programmed Home page is shown below:

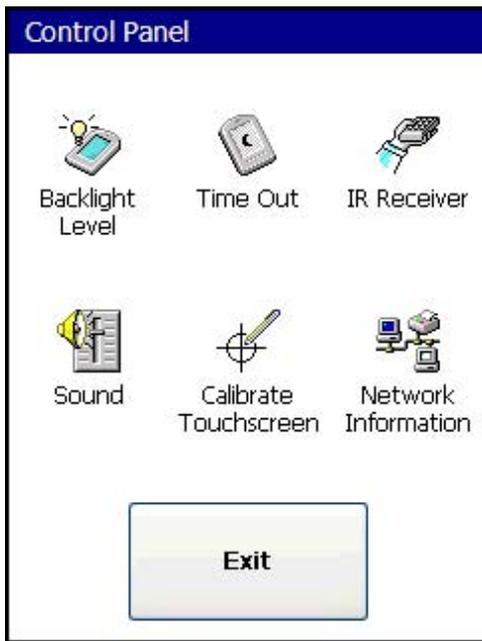


THE CONTROL PANEL PAGE

The Control Panel page can be displayed by pressing and holding the touchscreen while momentarily depressing the reset button. Continue to hold the touchscreen until the Control Panel appears.

You can also access the Control Panel page by assigning a "Control Panel" page link to a button using the *TheaterTouch Designer™* software.

A representation of the Control Panel page is shown below:

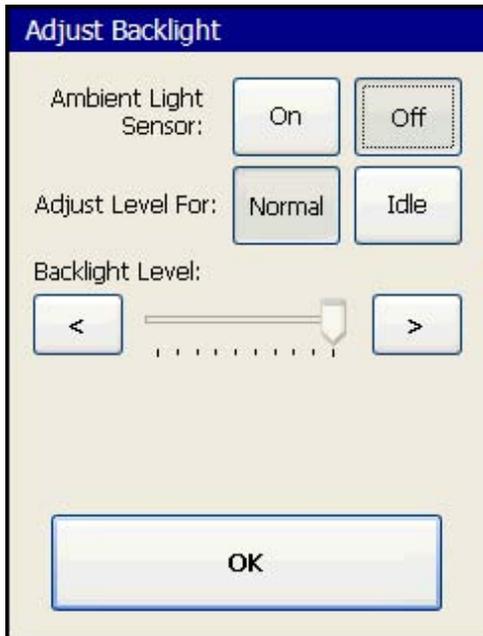


To return to the user level program, press Exit.

BACKLIGHT LEVEL

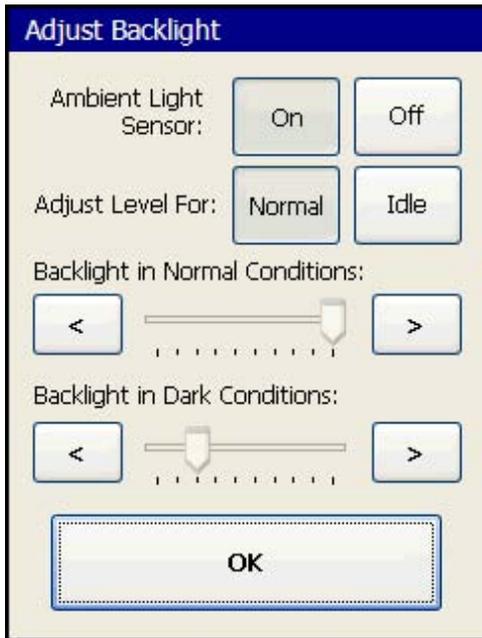
This button displays a window that allows you to adjust the backlight brightness and enable/disable the Ambient Light Sensor.

If the light sensor is disabled, there is only one backlight level to adjust. Press the left arrow or right arrow buttons to adjust. Press the OK button when finished.



With the light sensor disabled, the backlight brightness will always stay at the same level whenever the *RK-3* is turned-on. The backlight level can, however, be set differently for the unit's Normal and Idle modes.

If the light sensor is enabled, there are two backlight levels to adjust. Press the left arrow or right arrow buttons to adjust. Press the OK button when finished.



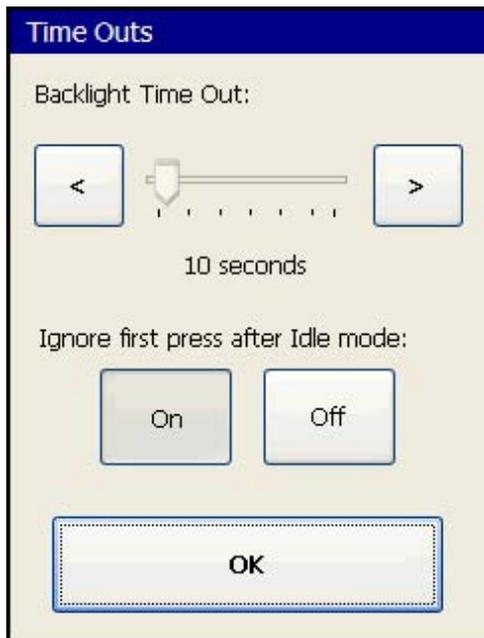
With the light sensor enabled, the backlight brightness will automatically change between the two levels, depending upon the ambient lighting conditions. Also, the backlight level can be set differently for the unit's Normal and Idle modes.

TIME OUT

This button displays a window that allows you to adjust the amount of time the unit stays awake after the last button press. The time is variable from 1 second to 120 seconds (the default is 10 seconds). Press the arrows to the left or right of the Time Out setting to adjust the time.

If the backlight is programmed to turn off in idle mode, it is a good idea to ignore the initial press of the touchscreen that turns the backlight on. This will prevent unwanted button activations from occurring (since you may not see what you're pressing on the touchscreen when the backlight is off). Select On to ignore the first press, or Off to accept the first press.

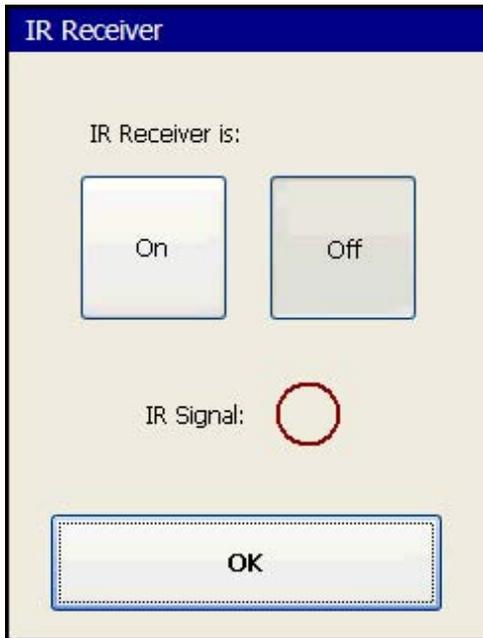
Press the OK button when finished.



IR RECEIVER

This button displays a window that allows you to enable or disable the front panel IR Receiver. The IR Signal graphic turns red to indicate IR data and/or noise being detected by the receiver. This helps to determine if you should enable the receiver in a particular environment.

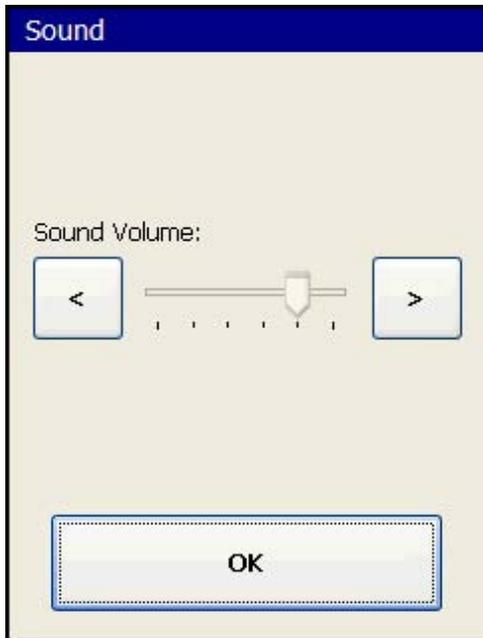
Press the OK button when finished.



SOUND

This button displays a window that allows you to adjust the volume of the audible speaker. The speaker sound provides feedback that a button was pressed. Press the arrows to the left or right to adjust the volume.

Press the OK button when finished.



There are six discrete volume settings. The lowest setting disables the speaker.

CALIBRATE TOUCHSCREEN

This button runs a routine that allows you to calibrate the touchscreen. Since it normally should not be necessary to calibrate the touchscreen, this routine is included as a precaution only.

Warning: Do not attempt to calibrate the touchscreen with your fingertip. Proper calibration requires a stylus or other fine tip. Do not use metal objects such as ball point pens or screwdrivers that can damage the surface of the touchscreen.

Press the Calibrate button to continue.

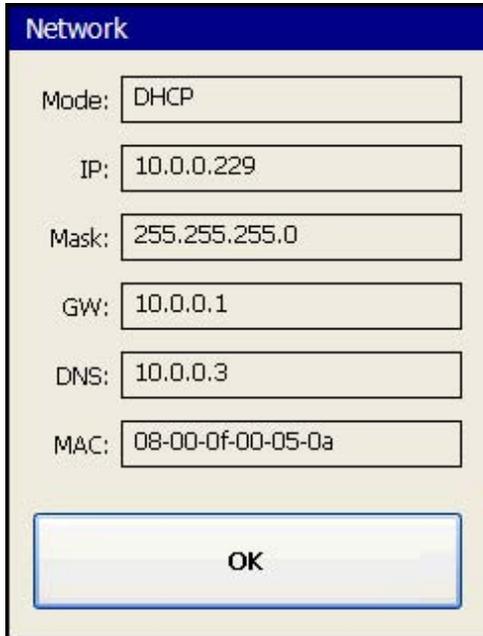


Follow the directions on the display to complete the calibration process.

NETWORK INFORMATION

This button displays a window that allows you to view the Ethernet network information. This is mainly for troubleshooting purposes.

Press the OK button when finished.



A dialog box titled "Network" with a blue header bar. The dialog contains six input fields for network configuration, each with a label and a text box. The fields are: Mode (DHCP), IP (10.0.0.229), Mask (255.255.255.0), GW (10.0.0.1), DNS (10.0.0.3), and MAC (08-00-0f-00-05-0a). At the bottom of the dialog is a large "OK" button.

Field	Value
Mode	DHCP
IP	10.0.0.229
Mask	255.255.255.0
GW	10.0.0.1
DNS	10.0.0.3
MAC	08-00-0f-00-05-0a

OK

THE WEB BROWSER

The RK-3 includes Internet Explorer® for web browsing on the internet. Although most website content is compatible with the RK-3, please note that plug-ins such as JAVA® and Flash®, streaming video, and persistent cookies are not supported.

A graphical representation of a keyboard will automatically pop-up on the display whenever text entry is required. The keyboard can be dragged around the display by using its title bar. It can be dismissed by touching anywhere on the display that is outside of the keyboard.



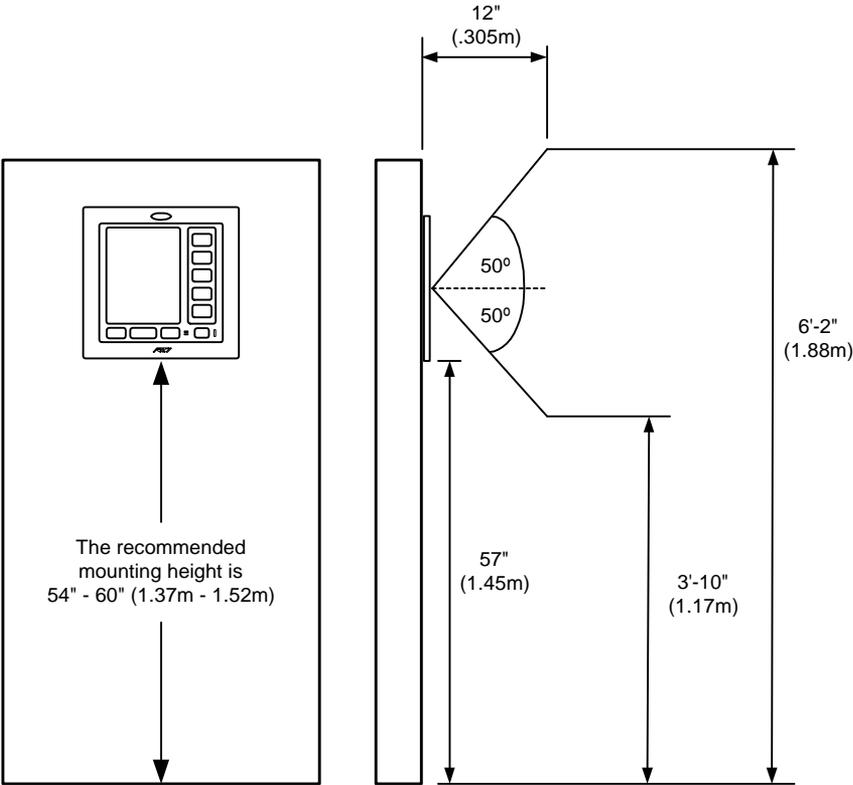
Chapter 4. Installation & Programming

The RK-3 is designed for flush-mount installations in walls or cabinets. It requires an available mounting depth of 2.5 inches (63mm) from the front surface of the wall. There are numerous options for mounting and wiring the RK-3.

Note: Make sure to use the included cardboard cut-out template to create the correct size opening in the wall.

MOUNTING HEIGHT

The recommended mounting height for the RK-3 is between 54" (1.37m) and 60" (1.52m) from the bottom of the faceplate.



RK-3 side view: Viewing angle at 57"

MOUNTING OPTIONS

The RK-3 has integrated mounting wings for retrofit installation in new or existing construction. Additionally, the RK-3 can be directly attached to certain walls (wood, etc.) using screws.

An optional drywall rough-in bracket (RTI part #: 10-210070-11) is available for conveniently locating the RK-3 in new construction installations.

WIRING CONNECTION OPTIONS

The RK-3 can be wired either from the Control Port or the Removable Terminal Block. A minimum of 3-conductor wire is required for basic operation (+16VDC, GND, and IR DATA).

CAT5 cable can be used to power the RK-3 up to 1000 feet (300m) if a full wire pair is used for both +16VDC and GND. For longer distances use the following size of unshielded multi-conductor cable:

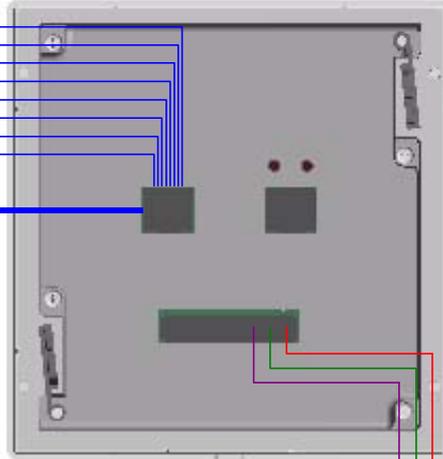
<u>Wire Size</u>	<u>Distance</u>
20 AWG	1300' (400m)
18 AWG	2000' (600m)

RK3 Basic Wiring Connections

Control Port Pin-Out

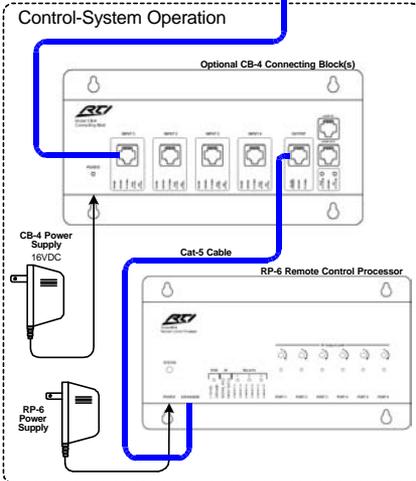
- GROUND — Pin 8
- GROUND — Pin 7
- INFRARED — Pin 6
- +16VDC — Pin 5
- +16VDC — Pin 4
- INFRARED — Pin 3
- RS-485 + — Pin 2 (Future Use)
- RS-485 - — Pin 1 (Future Use)

Cat-5 Cable

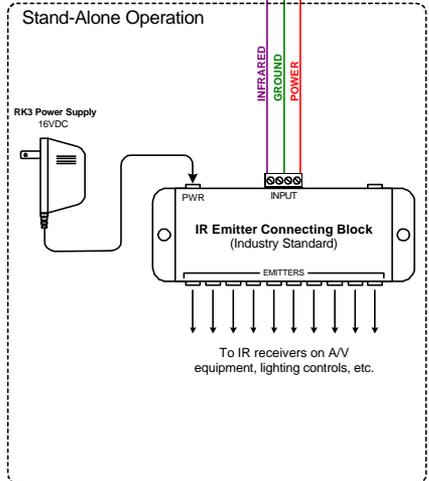


20 AWG (min.) wire
- or - full Cat-5
pairs

Control-System Operation



Stand-Alone Operation



RK-3 REMOVABLE TERMINAL BLOCK DESCRIPTION

TERMINAL NAME	DESCRIPTION
+16VDC	Positive power supply connection. This should be connected to 9VDC-16VDC.
GND	Common ground connection. Use this ground reference for any device that is connected to any of the other pins on the connector.
IR DATA	High current (200mA) IR output connection. This can be used to power up to 10 infrared mini-emitters, an IR blaster, or extending IR control over a long distance (1000 ft. max).
PWR STATUS	Voltage power sensing input connection. This can be connected to a trigger output or switched outlet (using a small wall-mount power supply) on A/V equipment, current sensors, light sensors, etc. The ON state sense voltage is 3VDC - 20VDC. The OFF state sense voltage is 0VDC - 2VDC.
GND	Common ground connection. Use this ground reference for any device that is connected to any of the other pins on the connector.

<p>RELAY CTRL</p>	<p>Voltage trigger output. This can be used to control speaker relays, screens, window coverings, etc. The output can supply up to 100mA and has a voltage equal to the input supply.</p>
<p>AUX STATUS</p>	<p>Voltage power sensing input connection. This can be connected to a trigger output or switched outlet (using a small wall-mount power supply) on A/V equipment, current sensors, light sensors, etc. The ON state sense voltage is 3VDC - 20VDC. The OFF state sense voltage is 0VDC - 2VDC.</p>
<p>TRIG OUT</p>	<p>Voltage trigger output. This can be used to control speaker relays, screens, window coverings, etc. The output can supply up to 100mA and has a voltage equal to the input supply.</p>

PROGRAMMING THE RK-3

The *RK-3* is programmed using RTI's *TheaterTouch Designer™* software. RTI dealers can download the software free of charge from:

www.rticorp.com/dealers

A PC running Windows® 98SE or higher with a USB port is required. The required USB cable is included with the RTI *IR-PRO* dealer kit.

In addition to using the USB port, the RK-3 can also be programmed via a LAN connection to its Ethernet port. This allows you to update multiple RK-3 units from one location, either at the site or remotely.

Chapter 5. Troubleshooting

If you are having problems with your *RK-3*, please read these troubleshooting tips before contacting technical support.

If you continue to have problems, see Chapter 5 for more information on contacting RTI technical support.

DISPLAY IS DIM, BLANK OR UNREADABLE

Make sure the external power supply is properly secured to the *RK-3*, and it is functioning properly.

Try adjusting the backlight level from the **Control Panel** page (Refer to Chapter 3 for more details).

By nature, the contrast of an LCD screen changes with temperature, so if the display is cold it will appear dark and will return to normal as it warms.

USB COMMUNICATION PROBLEMS

Verify that your PC is running Windows® 98SE or higher.

Verify that the *RK-3* USB driver was installed the first time the *RK-3* was connected to your PC.

Verify that the *RK-3* is present in the Device Manager within the Windows® Control Panel.

Make sure you are using the programming cable that was supplied by RTI and that both ends are connected securely.

Make sure the PC detects the presence of the *RK-3*. If it doesn't, unplug the USB cable, wait for about ten seconds, and plug it in again.

If the download fails after some data has been transferred, try re-sending the program.

IR CODE PROBLEMS

If you are using an IR repeater system, make sure it is working correctly with the original OEM remote. If not, you will need to troubleshoot the IR repeater system.

If you are still having problems, try adjusting the IR code “Minimum Repeats” value in the *TheaterTouch Designer* programming software.

If the IR code is executed inside a macro that contains multiple IR codes, try inserting a small time delay before the problem code. If there already is a delay, try increasing it.

Specifications

Power	16 VDC, .3 Amp max
Power Management	Adjustable backlight brightness/power down time
Touchscreen Display	High-brightness color TFT LCD 1/4 VGA (240 x 320 pixels) with 65K colors 70:1 contrast ratio Integrated high-resolution resistive touchscreen
Display Size	3.5 in. (89mm) diagonal
Display Backlight	White LED, 100nit
Infrared Output Port	200mA output Drives up to 1000 feet (300 meters) of wire
Ethernet Port	10/100Base-T
Operating Temperature	+32 °F to +122 °F (0 °C to +50 °C)
Operating Humidity	5% to 95% non-condensing
Total System Memory	32MByte Flash (non-volatile) memory
Device Capability	Total number of devices is limited only by memory
Macro Capability	Unlimited steps allowed in a single macro

	Total number of macros is limited only by memory
	Macro capability on every button
Communications	USB programming port
Enclosure	High-impact molded ABS plastic, black/gray
Front Plate	High-impact molded ABS plastic, white
Mounting	Integrated mounting wings, or screws through front bezel
Installation Cut-Out (W x H)	4.74 in. (120mm) x 5.22 in. (132mm)
Total Depth in Wall	1.6 in. (40mm)
Weight	0.64 lbs (290g)
Warranty	One Year (Parts & Labor)

All specifications are subject to change without notice.

It's Under Control®



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