

USER MANUAL

MODELS:

RC-308, RC-306, RC-208, RC-206
Ethernet and K-NET Control Keypad



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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 the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better!



The devices described in this user manual are generally referred to as **RC-308** or **Ethernet and K-NET Control Keypad**. A device is named specifically only when a device-specific feature is described.

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 www.kramerav.com/downloads/RC-308 to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

Achieving the Best Performance

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables).
- Do not secure the cables in tight bundles or roll the slack into tight coils.
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality.
- Position your Kramer **RC-308** 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.

Safety Instructions



Caution:

- This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.
- For products with relay terminals and GPIO ports, please refer to the permitted rating for an external connection, located next to the terminal or in the User Manual.
- There are no operator serviceable parts inside the unit.

**Warning:**

- Use only the power cord that is supplied with the unit.
- To ensure continuous risk protection, replace fuses only according to the rating specified on the product label which located on the bottom of the unit.

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 www.kramerav.com/support/recycling.

Overview

Congratulations on purchasing your Kramer **Ethernet and K-NET Control Keypad**. This User Manual describes the following four devices: **RC-308**, **RC-306**, **RC-208** and **RC-206**.

The **Ethernet and K-NET Control Keypad** is a compact button control keypad that fits US, European and UK standard 1 Gang wall junction boxes. Easy to deploy, it fits decoratively within a room design. It is perfectly suited for use as a user interface keypad within a Kramer Control system. Using **K-Config**, tap into the rich, built-in I/O interfaces that enable this keypad to be used as a flexible, standalone room controller. In this way, it is ideal for classroom and meeting room control, providing end-user convenient control of complex multimedia systems and other room facilities such as screens, lighting and shades. Multiple keypads can be linked together side-by-side or at a distance, via a single K-NET™ cable carrying both power and communication, providing uniform design and user experience.

The table below defines the variations between the different models:

Device Name	Keypad Buttons	Ethernet with PoE Capabilities
RC-308	8	Yes
RC-306	6	Yes
RC-208	8	No
RC-206	6	No

The **Ethernet and K-NET Control Keypad** provides advanced and user-friendly operation and flexible control.

Advanced and User-Friendly Operation

- Clear and Customizable User Interface – RGB-color, tactile feedback, backlit buttons with custom-labeled, removable button caps, allowing simple and intuitive end-user and guest control over facility deployed devices and systems.
- Simple Control Programming – Using K-Config software. Leverage the power of Kramer's highly customizable, flexible and user-friendly software, to easily program complex control scenarios of Pro-AV, Lighting, and other room and facility-controlled devices.
- Easy and Cost-effective Installation – Compactly fits into standard US, EU and UK 1 Gang in-wall box size, allows decorative integration with room deployed user interfaces such as electrical switches. Keypad installation is fast and cost-effective via single LAN cable communication.
- For **RC-308** and **RC-306** only, LAN cable also provides Power over Ethernet (PoE).

Flexible Control

- Flexible Room Control – Control any room device via LAN connections, multiple RS-232 and RS-485 serial ports, and various IR, relay and general purpose I/O built-in device ports. Connect the keypad to an IP network with additional control gateways interfacing with remote controlled devices, for extending control across large space facilities.
- Expandable Control System – Easily expands to be part of a larger control system, or coupled-operation with auxiliary keypads, via either LAN or K-NET™ single cable connection delivering both power and communication.

Typical Applications

RC-308 is ideal for the following typical applications:

- Control in presentation and conference room systems, board rooms and auditoriums.
- Control interface for Kramer Control.

Defining the Ethernet and K-NET Control Keypad

This section defines the RC-308, RC-208, RC-306 and RC-206.

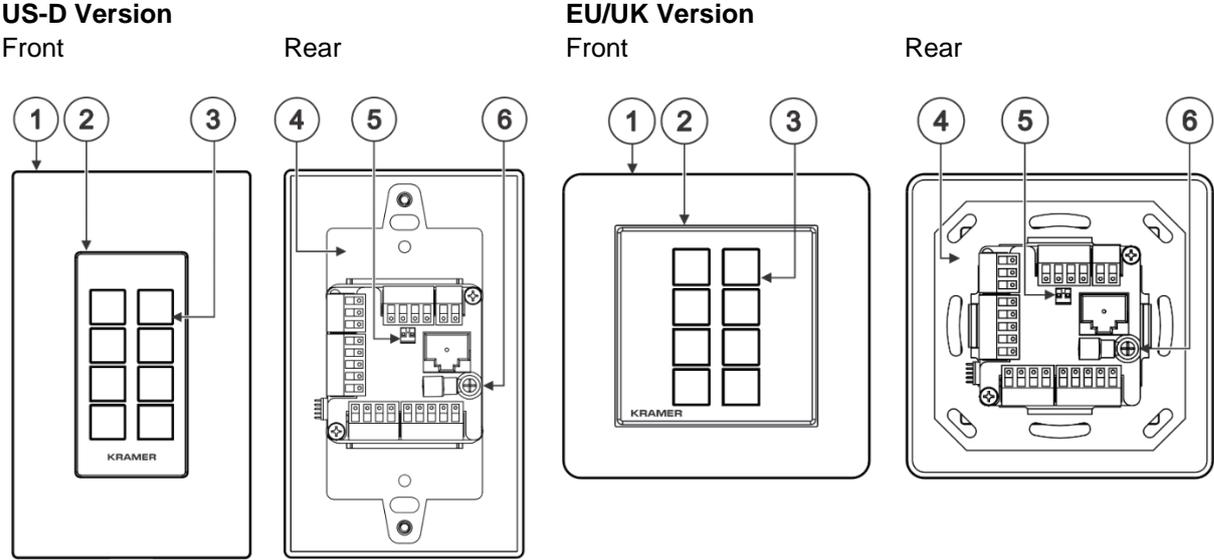


Figure 1: RC-308 and RC-208 Ethernet and K-NET Control Keypad Front Panel

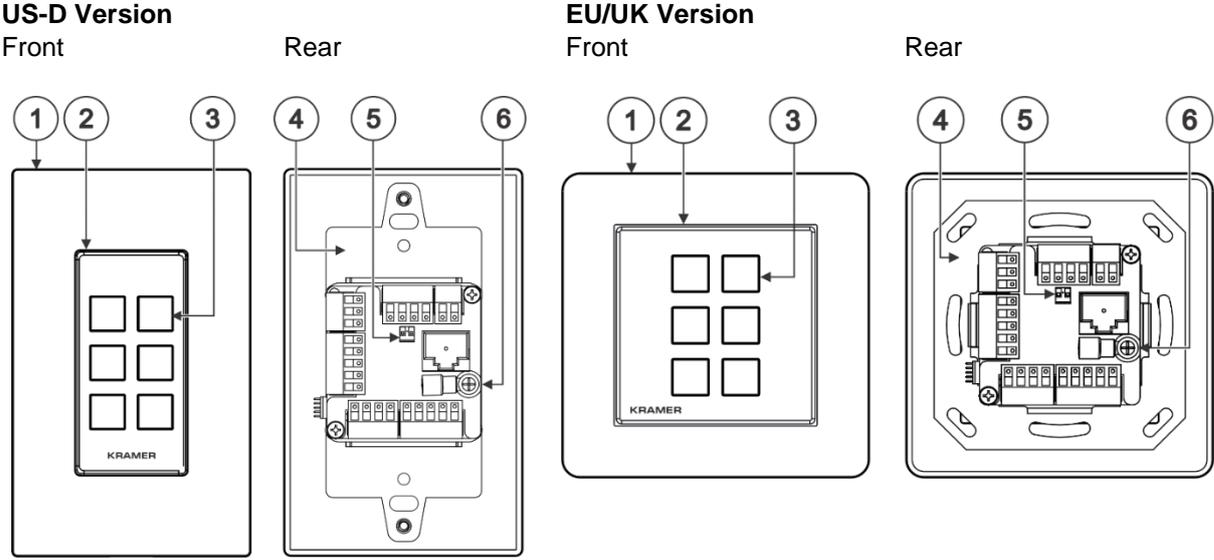


Figure 2: RC-306 and RC-206 Ethernet and K-NET Control Keypad Front Panel

#	Feature	Function
①	Designed 1 Gang Wall Frame	For fixing the RC-308 to the wall. DECORA™ design frames are included in US-D models.
②	Button Faceplate	Covers the buttons area after inserting the button labels into the clear button caps (supplied separately) and attaching them (see Inserting Button Labels on page 8).
③	Configurable RGB Backlit Buttons	Configured to control the room and A/V devices. RC-308 / RC-208 : 8 backlit buttons. RC-306 / RC-206 : 6 backlit buttons.
④	Mounting Bracket	For fixing the frame to the in-wall box.

#	Feature	Function	
5	DIP-Switches	For K-NET: The last physical device on a K-NET bus must be terminated. For RS-485: The first and the last units on the RS-485 line should be terminated. Other units should remain unterminated.	
		DIP-switch 1 (to the left) K-NET Line Termination	DIP-switch 2 (to the right) RS-485 Line Termination
		Slide down (ON)	For K-NET line-termination. For RS-485 line-termination.
	Slide up (OFF, default)	To leave bus unterminated. To leave RS-485 line unterminated.	
6	Ring Tongue Terminal Grounding Screw	Connect to grounding wire (optional).	

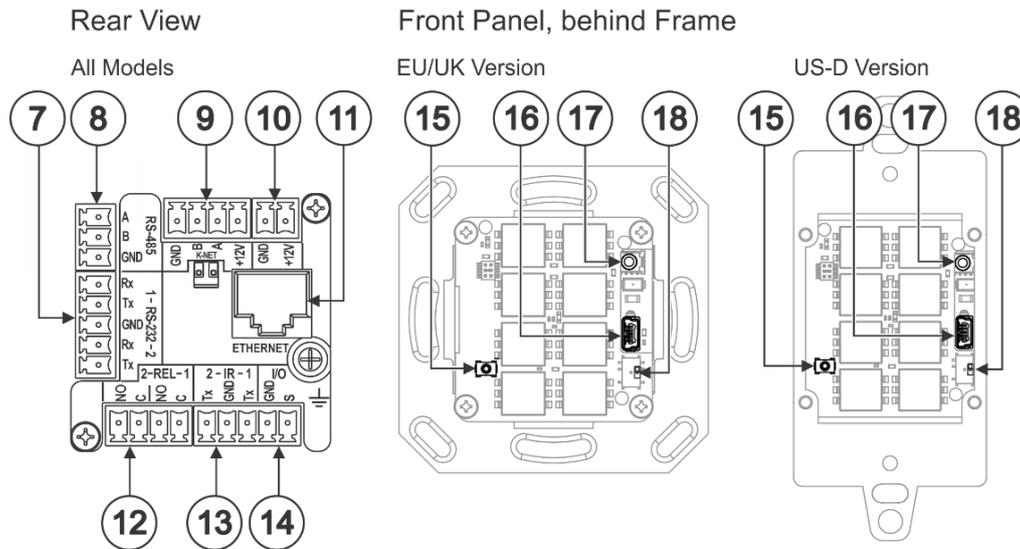


Figure 3: Ethernet and K-NET Control Keypad Rear View

#	Feature	Function
7	RS-232 3-pin Terminal Block Connectors (Rx, Tx, GND)	Connect to RS-232 controlled devices (1 and 2, with common GND).
8	RS-485 3-pin Terminal Block Connector	Connect to the RS-485 terminal block connector on another device or PC.
9	KNET 4-pin Terminal Block Connector	Connect the GND pin to the Ground connection; pin B (-) and pin A (+) are for RS-485, and the +12V pin is for powering the connected unit.
10	12V Power Supply 2-pin Terminal Block Connector (+12V, GND)	Connect to a power supply: Connect GND to GND and 12V to 12V. For RC-308 / RC-306 only, you can also power the unit via a PoE provider.
11	ETHERNET RJ-45 Connector	Connect to an Ethernet LAN for control, firmware upgrade and for uploading the configuration. For RC-308 / RC-306 only, LAN also provides PoE.
12	REL 2-pin Terminal Block Connectors	Connect to a device to be controlled by relay. For example, a motorized projection-screen (1 and 2).
13	IR 2-pin Terminal Block Connectors (Tx, GND)	Connect to an IR emitter cable (1 and 2, with common GND).
14	I/O 2-pin Terminal Block Connector (S, GND)	Connect to a sensor or device to be controlled, for example, a motion sensor. This port may be configured as a digital input, digital output, or analog input.
15	Factory Reset Button	Press while connecting the power and then release to reset the device to its default parameters. To access this button, you need to remove the Button Faceplate.

#	Feature	Function
①6	Mini USB Type B Port	Connect to your PC for firmware upgrade or for uploading the configuration. To access the USB port, you need to remove the Button Faceplate.
①7	IR Sensor	For learning commands from an IR remote control transmitter.
①8	Programing DIP-switch	For internal use. Always keep set to UP (towards the mini USB port).

Preparing the RC-308

This section describes the following actions:

- [Configuring the RC-308](#) on page [7](#).
- [Inserting Button Labels](#) on page [8](#).
- [Replacing a Button Label](#) on page [8](#).

Configuring the RC-308

You can configure the device in the following ways:

- [RC-308 as a Master Controller](#) on page [7](#).
- [RC-308 as a Control Interface](#) on page [7](#).

RC-308 as a Master Controller

Before connecting to the devices and mounting the RC-308, you need to configure the buttons via K-Config.

To configure the RC-308 buttons:

1. Download **K-Config** onto your PC, see www.kramerav.com/product/RC-308 and install it.
2. Connect the **RC-308** to your PC via one of the following ports:
 - The mini USB port [16](#) (on the front panel, behind the frame).
 - The Ethernet port [11](#) (on the rear panel).
3. If required, connect the power:
 - When connecting via USB, you need to power the device.
 - When connecting via the **RC-208 / RC-206** Ethernet port, you need to power the device.
 - When connecting via the **RC-308 / RC-306** Ethernet port, you can use PoE instead of powering the device.
4. Configure the buttons via **K-Config** (see www.kramerav.com/product/RC-308).
5. Sync the configuration to **RC-308**.

RC-308 as a Control Interface

To use RC-308 as a control interface:

1. Connect the power to the device.
2. If required, configure Ethernet settings.

Inserting Button Labels

You can label a button using the supplied button sheet button can be configured to perform a set of actions. For example, a button that is assigned to turn on the lights in a room and then turn on the projector can be labeled “ON”.

To insert button labels:

1. Remove a label from the button label sheet.
2. Place the label inside the button cover.

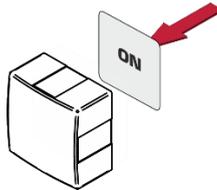


Figure 4: Inserting the Label

3. Cover the button with the button cap.

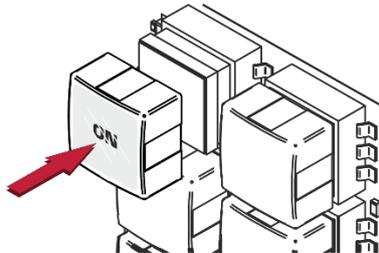


Figure 5: Attaching the Button

Replacing a Button Label

Use the supplied tweezers to replace a button label.

To replace a button label:

1. Using the supplied tweezers, grip the button cap via the horizontal or vertical ledges and remove the cap.

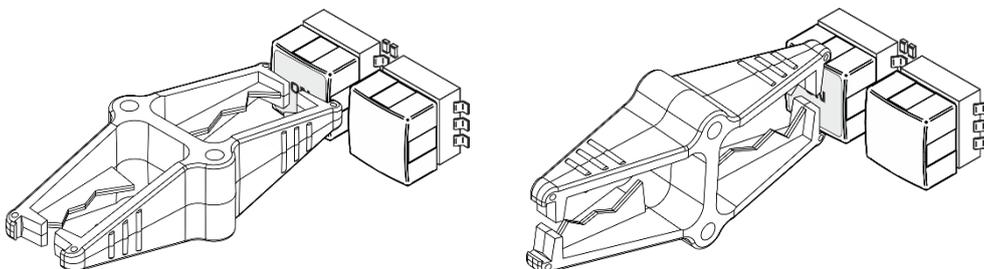


Figure 6: Removing the Button Cap

2. Replace the label and cover the button with the button cap (see [Inserting Button Labels](#) on page [8](#)).

Installing the RC-308

This section describes the following actions:

- [Installing the Junction Box](#) on page 9.
- [Connecting the RC-308](#) on page 9.

Installing the Junction Box

Before connecting the **RC-308**, you need to mount a 1 Gang in-wall junction box.

We recommend that you use any of the following standard 1 Gang in-wall junction boxes (or their equivalent):

- **US-D:** 1 Gang US electrical junction boxes.
- **EU:** 1 Gang in-wall junction box, with a cut-hole diameter of 68mm and depth that can fit in both the device and the connected cables (DIN 49073).
- **UK:** 1 Gang in-wall junction box, 75x75mm (W, H), and depth that can fit in both the device and the connected cables (BS 4662 or BS EN 60670-1 used with supplied spacers and screws).

To mount the in-wall junction box:

1. Carefully break the knock-off holes where appropriate to pass the cables through the box.
2. Feed the cables from the rear/sides of the box out through the front.
3. Insert the junction box and attach it inside the wall.

The box is installed, and the wiring is ready for connection.

Connecting the RC-308



Always switch off the power to each device before connecting it to your **RC-308**. After connecting your **RC-308**, connect its power and then switch on the power to each device.

To connect RC-308 as illustrated in Figure 7:

1. Connect the IR terminal block connector outputs ⁽¹³⁾ as follows:
 - Connect IR 1 (Tx, GND) to an IR emitter cable and attach the emitter to the IR sensor of an IR-controllable device (for example, a power amplifier).
 - Connect IR 2 (Tx, GND) to an IR emitter cable and attach the emitter to the IR sensor of an IR-controllable device (for example, a Blu-ray player).

2. Connect the RS-232 terminal block connectors (7) as follows (see [Connecting RS-232 Devices](#) on page 11):
 - Connect RS-232 1 (Rx Tx, GND) to the RS-232 port of a serial-controllable device (for example, a switcher).
 - Connect RS-232 2 (Rx Tx, GND) to the RS-232 port of a serial-controllable device (for example, a projector).
3. Connect the relay terminal block connectors (12) as follows:
 - Connect REL 1 (NO, C) to a relay-controllable device (for example, for lifting a screen).
 - Connect REL 2 (NO, C) to a relay-controllable device (for example, for lowering a screen).
4. Connect the GPI/O terminal block connector (GND, S) (14) to a motion detector.
5. Connect the ETH RJ-45 port (11) to an Ethernet device (for example, an Ethernet switch) (see [Connecting the Ethernet Port](#) on page 13).
6. Connect the RS-485 terminal block connector (A, B, GND) (8) to serial controllable device (for example, a light controller).
Set the RS-485 DIP-switch (see [Connecting RS-485 Devices](#) on page 12).
7. Connect the K-NET terminal block connector (9) to a room controller device with K-NET (for example, the **RC-306**).
Set the K-NET DIP-switch (see [Connecting the K-NET Port](#) on page 12).
8. Connect the 12V DC power adapter (10) to the **RC-308** power socket and to the mains electricity.



For **RC-308** / **RC-306** only, you can also power the unit via a PoE provider, so you do not need to connect the power adapter.

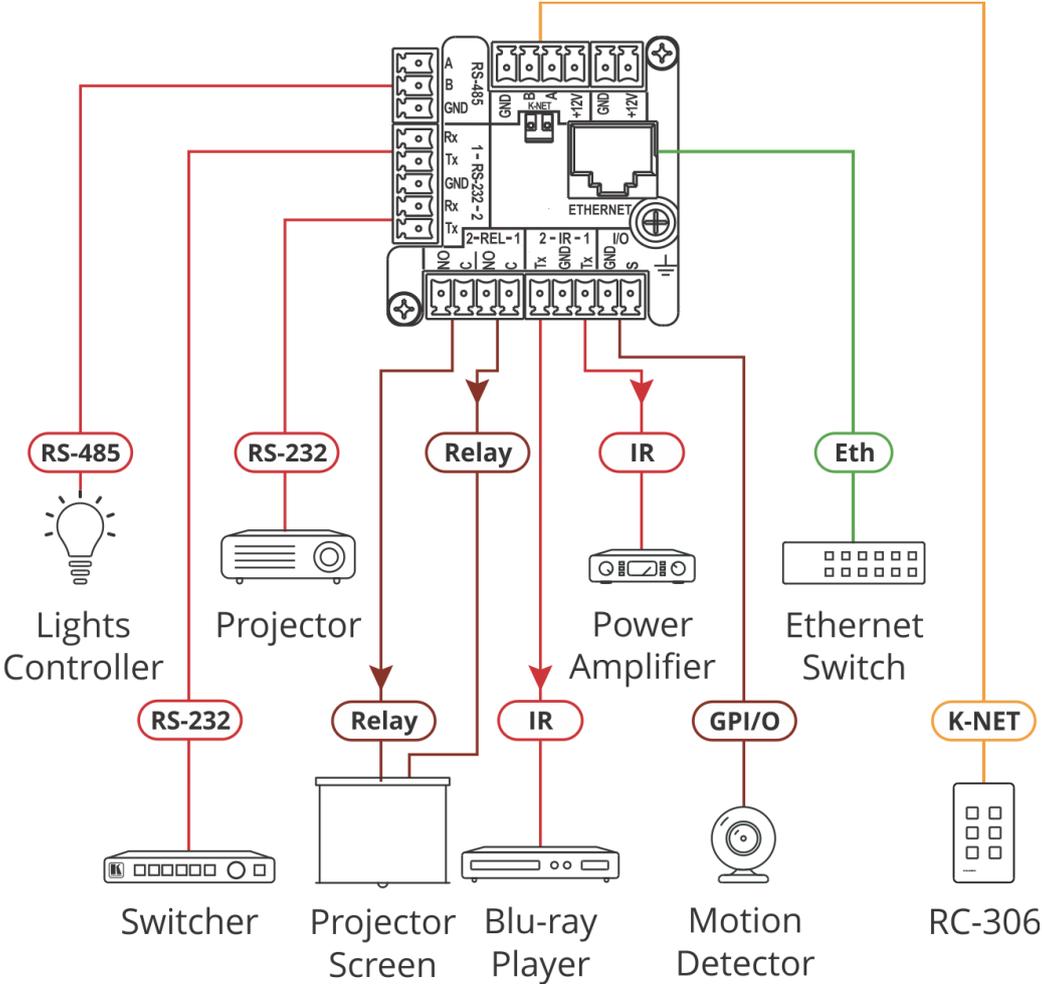


Figure 7: Connecting to the RC-308 Rear Panel

Connecting RS-232 Devices

You can connect a device to the **RC-308**, via the RS-232 terminal block (7) on the rear panel of the **RC-308**, as follows (see [Figure 8](#)):

- TX pin to Pin 2.
- RX pin to Pin 3.
- GND pin to Pin 5.

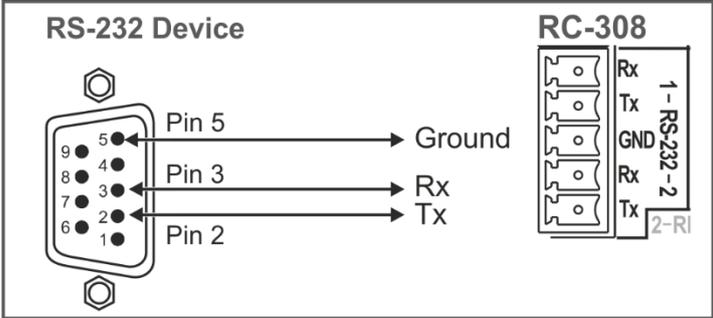


Figure 8: RS-232 Connection

Connecting the K-NET Port

The K-NET port ⑨ is wired as shown in [Figure 9](#).

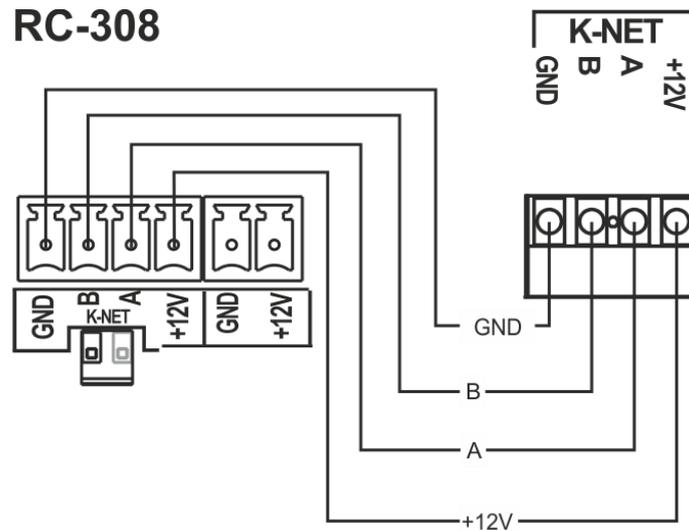


Figure 9: K-NET PINOUT Connection

⑩ The first and the last units on the K-NET line should be terminated (ON). Other units should not be terminated (OFF):

- For K-NET termination, set the left DIP-switch 2 ⑤ to down (on).
- To leave K-NET unterminated, keep DIP-switch 2 up (off, the default).

Connecting RS-485 Devices

You can control up to one AV device by connecting it to the **RC-308** via its RS-485 ⑧ connection.

To connect a device to the RC-308 via RS-485:

- Connect the A (+) pin of the device to the **A** pin on the **RC-308** RS-485 terminal block.
- Connect the B (-) pin of the device to the **B** pin on the **RC-308** RS-485 terminal block.
- Connect the G pin of the device to the **GND** pin on the **RC-308** RS-485 terminal block.

⑩ The first and the last units on the RS-485 line should be terminated (ON). Other units should not be terminated (OFF):

- For RS-485 termination, set the right DIP-switch 2 ⑤ to down (on).
- To leave RS-485 unterminated, keep DIP-switch 2 up (off, the default).

Grounding the RC-308

The grounding screw ⑥ is used to earth the chassis of the unit to the building ground preventing static electricity from impacting the performance of the unit.

[Figure 10](#) defines the grounding screw components.

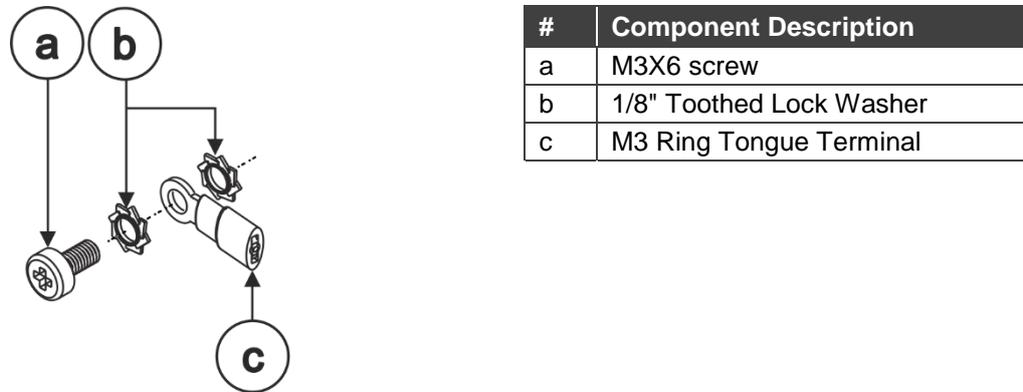


Figure 10: Grounding Connection Components

To ground the RC-308:

1. Connect the ring tongue terminal to the building grounding point wire (a green-yellow, AWG#18 (0.82mm²) wire, crimped with a proper hand-tool is recommended).
2. Insert the M3x6 screw through the toothed lock washers and the tongue terminal in the order shown above.
3. Insert the M3x6 screw (with the two toothed lock washers and ring tongue terminal) into the grounding screw hole and tighten the screw.

Connecting the Ethernet Port

To connect to the **RC-308** on first installation, you need to identify the IP address that has been automatically assigned to the **RC-308**. You can do so:

- Through **K-Config** when connected via USB.
- By using a Network scanner.
- By typing the host name on any browser, which includes the name of the device, “-“ and the last 4 digits of the device serial number (found on the device).
For example, if the serial number is xxxxxxxx0015 the host name is RC-308-0015.

Mounting the RC-308

Once the ports are connected and the DIP-switches set, you can insert the device into the in-wall junction box and connect the parts as shown in the illustrations below:



Take care not to damage the connecting wires/cables while inserting the device.

EU/UK Version

[Figure 11](#) shows how to install the RC-308 EU/UK version:

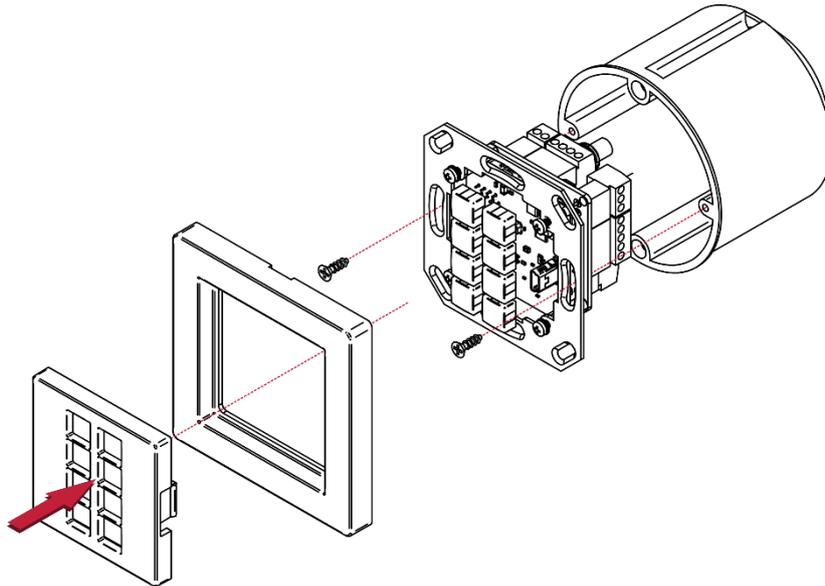


Figure 11: Installing the RC-308 EU/UK Version

For BS EN 60670-1, attach the spacers (supplied) before inserting the device.

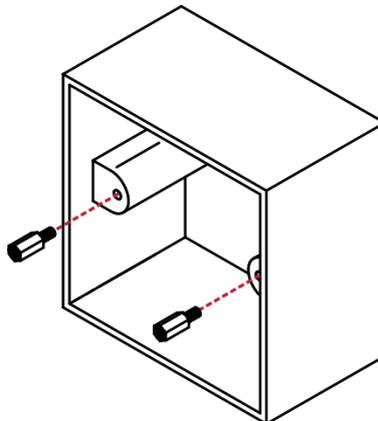


Figure 12: Using Spacers for BS-EN 60670-1 Junction Box

US-D Version

Figure 13 shows how to install the US-D version:

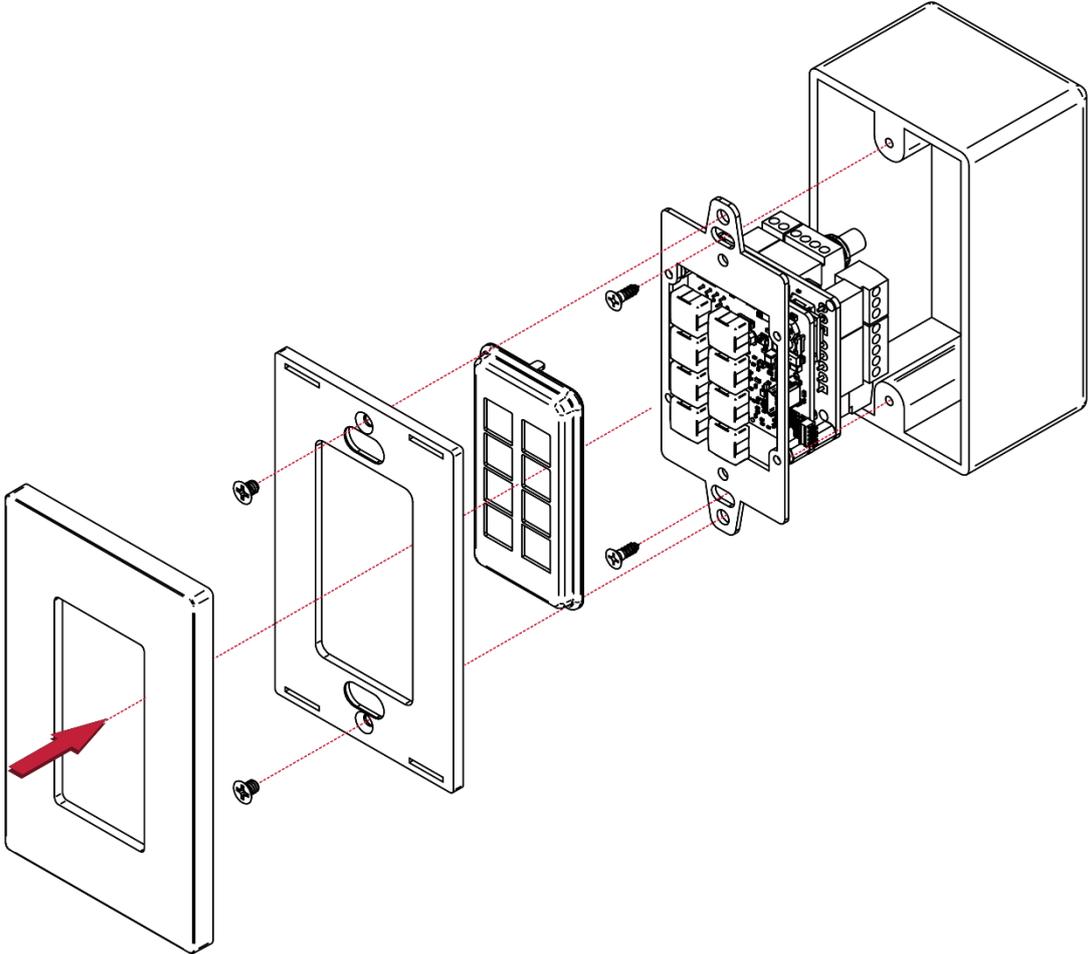


Figure 13: Installing the US-D Version

Operating the RC-308

To operate **RC-308**, simply press a button to activate a sequence of configured actions.

Technical Specifications

Inputs	1 IR Sensor	For IR learning
Outputs	2 IR	On 3-pin terminal block connectors
Ports	2 RS-232	On 5-pin terminal block connectors
	1 RS-485	On a 3-pin terminal block connector
	1 K-NET	On a 4-pin terminal block connector
	2 Relays	On 2-pin terminal block connectors (30V DC, 1A)
	1 GPI/O	On a 2-pin terminal block connector
	1 Mini USB	On a female mini USB-B connector for configuration and firmware upgrade
	1 Ethernet	On an RJ-45 female connector for device configuration, control and firmware upgrade RC-308 and RC-306: also provides PoE
Default IP Settings	DHCP Enabled	To connect to the RC-308 on first installation, you need to identify the IP address that has been automatically assigned to the RC-308
Power	Consumption	RC-308 and RC-306: 12V DC, 780mA RC-208: 12V DC, 760mA RC-206: 12V, 750mA
	Source	12V DC, 2A with open DC head Power required for PoE, 12W (RC-308 and RC-306)
Environmental Conditions	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
Regulatory Compliance	Safety	CE
	Environmental	RoHs, WEEE
Enclosure	Size	1 Gang wall plate
	Cooling	Convection ventilation
General	Net Dimensions (W, D, H)	US-D: 7.9cm x 4.7cm x 12.4cm (3.1" x 1.9" x 4.9) EU: 8cm x 4.7cm x 8cm (3.1" x 1.9" x 3.1) UK: 8.6cm x 4.7cm x 8.6cm (3.4" x 1.9" x 3.4")
	Shipping Dimensions (W, D, H)	23.2cm x 13.6cm x 10cm (9.1" x 5.4" x 3.9")
	Net Weight	0.11kg (0.24lbs)
	Shipping Weight	0.38kg (0.84lbs) approx.
Accessories	Included	Special tweezers for removing button caps 1 Power adapter, 1 power cord, installation accessories US-D version: 2 US Frame sets and faceplates (1 in black and 1 in white) European version: 1 EU white frame, 1 UK white frame, 1 EU/UK white faceplate
	Optional	For optimum range and performance use the recommended USB, Ethernet, serial and IR Kramer cables available at www.kramerav.com/product/RC-308
Specifications are subject to change without notice at www.kramerav.com		

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Default Communication Parameters

RS-232 over Micro USB	
Baud Rate:	115200
Data Bits:	8
Stop Bits:	1
Parity:	None
Ethernet	
DHCP is enabled by factory default, the following are the default addresses if no DHCP server is found.	
IP Address:	192.168.1.39
Subnet Mask:	255.255.0.0
Default Gateway:	192.168.0.1
TCP Port #:	5000
Concurrent TCP Connections:	70
Full Factory Reset	
Behind front panel:	Press while connecting the power and then release to reset the device to its default parameters. To access this button, you need to remove the Button Faceplate.

The warranty obligations of Kramer Electronics Inc. ("Kramer Electronics") for this product are limited to the terms set forth below:

What is Covered

This limited warranty covers defects in materials and workmanship in this product.

What is Not Covered

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Kramer Electronics to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover cartons, equipment enclosures, cables or accessories used in conjunction with this product.

Without limiting any other exclusion herein, Kramer Electronics does not warrant that the product covered hereby, including, without limitation, the technology and/or integrated circuit(s) included in the product, will not become obsolete or that such items are or will remain compatible with any other product or technology with which the product may be used.

How Long this Coverage Lasts

The standard limited warranty for Kramer products is seven (7) years from the date of original purchase, with the following exceptions:

1. All Kramer VIA hardware products are covered by a standard three (3) year warranty for the VIA hardware and a standard three (3) year warranty for firmware and software updates; all Kramer VIA accessories, adapters, tags, and dongles are covered by a standard one (1) year warranty.
2. All Kramer fiber optic cables, adapter-size fiber optic extenders, pluggable optical modules, active cables, cable retractors, all ring mounted adapters, all Kramer speakers and Kramer touch panels are covered by a standard one (1) year warranty.
3. All Kramer Cobra products, all Kramer Calibre products, all Kramer Minicom digital signage products, all HighSecLabs products, all streaming, and all wireless products are covered by a standard three (3) year warranty.
4. All Sierra Video MultiViewers are covered by a standard five (5) year warranty.
5. Sierra switchers & control panels are covered by a standard seven (7) year warranty (excluding power supplies and fans that are covered for three (3) years).
6. K-Touch software is covered by a standard one (1) year warranty for software updates.
7. All Kramer passive cables are covered by a ten (10) year warranty.

Who is Covered

Only the original purchaser of this product is covered under this limited warranty. This limited warranty is not transferable to subsequent purchasers or owners of this product.

What Kramer Electronics Will Do

Kramer Electronics will, at its sole option, provide one of the following three remedies to whatever extent it shall deem necessary to satisfy a proper claim under this limited warranty:

1. Elect to repair or facilitate the repair of any defective parts within a reasonable period of time, free of any charge for the necessary parts and labor to complete the repair and restore this product to its proper operating condition. Kramer Electronics will also pay the shipping costs necessary to return this product once the repair is complete.
2. Replace this product with a direct replacement or with a similar product deemed by Kramer Electronics to perform substantially the same function as the original product.
3. Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

What Kramer Electronics Will Not Do Under This Limited Warranty

If this product is returned to Kramer Electronics or the authorized dealer from which it was purchased or any other party authorized to repair Kramer Electronics products, this product must be insured during shipment, with the insurance and shipping charges prepaid by you. If this product is returned uninsured, you assume all risks of loss or damage during shipment. Kramer Electronics will not be responsible for any costs related to the removal or re-installation of this product from or into any installation. Kramer Electronics will not be responsible for any costs related to any setting up this product, any adjustment of user controls or any programming required for a specific installation of this product.

How to Obtain a Remedy Under This Limited Warranty

To obtain a remedy under this limited warranty, you must contact either the authorized Kramer Electronics reseller from whom you purchased this product or the Kramer Electronics office nearest you. For a list of authorized Kramer Electronics resellers and/or Kramer Electronics authorized service providers, visit our web site at www.kramerav.com or contact the Kramer Electronics office nearest you.

In order to pursue any remedy under this limited warranty, you must possess an original, dated receipt as proof of purchase from an authorized Kramer Electronics reseller. If this product is returned under this limited warranty, a return authorization number, obtained from Kramer Electronics, will be required (RMA number). You may also be directed to an authorized reseller or a person authorized by Kramer Electronics to repair the product.

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SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing

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