



KRAMER ELECTRONICS LTD.

# USER MANUAL

MODEL:

**FC-132ETH**

33x9 Serial/Data Router

---

P/N: 2900-300229 Rev 3

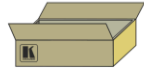
# FC-132ETH 33x9 Serial/Data Router Quick Start Guide



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.

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

- ☒ **FC-132ETH** 33x9 Serial/Data Router
- ☒ 1 Quick Start Guide
- ☒ 1 Set of rack "ears"
- ☒ 1 Power cord
- ☒ 4 Rubber feet



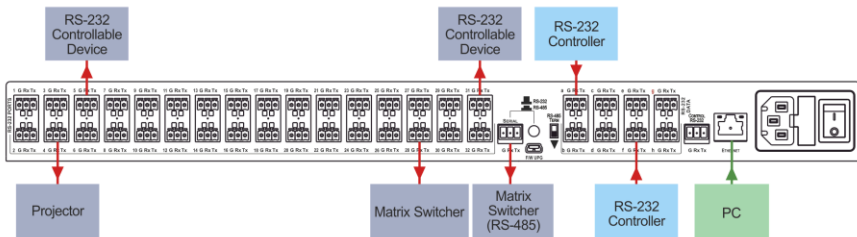
Save the original box and packaging in case your **FC-132ETH** needs to be returned to the factory for service.

## Step 2: Install the FC-132ETH

Mount the device in a rack (using the included rack "ears") or attach the rubber feet and place the device on a shelf.

## Step 3: Connect the inputs and outputs

Always switch off the power to all devices before connecting them to your **FC-132ETH**.



Always use Kramer high-performance cables for connecting equipment to the **FC-132ETH**.

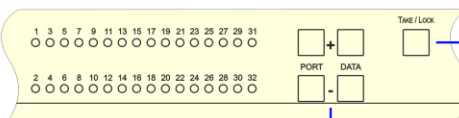
## Step 4: Connect the power

Connect the power cord to the **FC-132ETH** and plug it into the mains electricity.



## Step 5: Configure and Operate the FC-132ETH

- Configure the Ethernet controller
  - Set DHCP or assign a static IP address
  - Associate IP port(s) with serial port(s)
  - Configure the serial port parameters
- Configure virtual port(s) on the PC
- Configure Ethernet connection(s) on the PC
- Switch port(s) on the Ethernet Controller



### Switch a Data connection to a Port

- Select an output Port using the Port buttons
- Select a Data connection using the Data buttons
- Press the Take button

### Lock and Unlock the Front Panel Buttons

#### To lock:

- Press and hold the Take/Lock button for 5 seconds. The display shows Locked

#### To unlock:

- Press and hold the Take/Lock button for 5 seconds. The display shows Unlocked

# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
<b>2</b>	<b>Getting Started</b>	<b>2</b>
2.1	Achieving the Best Performance	2
2.2	Safety Instructions	2
2.3	Recycling Kramer Products	3
<b>3</b>	<b>Overview</b>	<b>4</b>
<b>4</b>	<b>Defining the FC-132ETH 33x9 Serial/Data Router</b>	<b>6</b>
<b>5</b>	<b>Installing in a Rack</b>	<b>9</b>
<b>6</b>	<b>Initial Configuration and Use Overview</b>	<b>10</b>
6.1	Configuring the FC-132ETH	11
6.2	Configuring a Virtual Port on the PC	12
6.3	Configuring an Ethernet Connection on the PC	12
6.4	Switching Ports on the FC-132ETH	12
<b>7</b>	<b>Connecting the FC-132ETH 33x9 Serial/Data Router</b>	<b>14</b>
7.1	Connecting to the FC-132ETH 33x9 Serial/Data Router via RS-232	15
7.2	Connecting to the FC-132ETH 33x9 Serial/Data Router via Ethernet	15
<b>8</b>	<b>Operating the FC-132ETH Locally</b>	<b>20</b>
8.1	Switching a Data Connection to an Output Port	20
8.2	Locking and Unlocking the Front Panel Buttons	20
<b>9</b>	<b>Operating the FC-132ETH Remotely via the Web Pages</b>	<b>21</b>
9.1	Browsing the FC-132ETH Web Pages	21
9.2	Connected Clients Page	23
9.3	Routing Map Page	24
9.4	Device Settings Page	24
9.5	Communication Page	26
9.6	Serial Port Settings Page	27
9.7	Security Page	28
9.8	Logs Page	31
9.9	About Us Page	32
<b>10</b>	<b>Configuring and Maintaining the FC-132ETH</b>	<b>33</b>
10.1	Terminating the RS-485 Bus	33
10.2	Selecting the RS-232 or RS-485 Port	33
10.3	Activating and Deactivating DHCP	33
10.4	Resetting to the Factory Default Settings	34
10.5	Upgrading the Firmware	34
<b>11</b>	<b>Technical Specifications</b>	<b>35</b>
11.1	Data Handling Performance	35
11.2	Example Bandwidth Calculation	36
<b>12</b>	<b>Default Communication Parameters</b>	<b>37</b>
<b>13</b>	<b>Protocol 3000</b>	<b>38</b>
13.1	Kramer Protocol 3000 Syntax	38
13.2	Kramer Protocol 3000 Commands	41
13.3	Kramer Protocol 3000 – Detailed Commands	42
13.4	Parameters	55

## Figures

Figure 1: FC-132ETH 33x9 Serial/Data Router Front Panel	6
Figure 2: FC-132ETH 33x9 Serial/Data Router Rear Panel	8
Figure 3: Connecting the FC-132ETH for Initial Configuration	10
Figure 4: The Port Window – Selecting a Remote Connection	12
Figure 5: Connecting the FC-132ETH 33x9 Serial/Data Router	14
Figure 6: Local Area Connection Properties Window	16
Figure 7: Internet Protocol Version 4 Properties Window	17
Figure 8: Internet Protocol Version 6 Properties Window	18
Figure 9: Internet Protocol Properties Window	19
Figure 10: General Info Page	22
Figure 11: Connected Clients Page	23
Figure 12: Serial Port Settings Page	24
Figure 13: Device Settings Page	25
Figure 14: Communication Page	26
Figure 15: Serial Port Settings Page	28
Figure 16: Security Page	28
Figure 17: Security Confirmation Popup	29
Figure 18: Authentication Required Popup	29
Figure 19: Security Activated Page	30
Figure 20: Logs Page	31
Figure 21: About Us Page	32

---

# 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 **FC-132ETH** 33x9 *Serial/Data Router*, which is ideal for the following typical applications:

- Conference room presentations
- Advertising applications
- Rental and staging

---

## 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 (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 **FC-132ETH** 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:** Use only the power cord that is supplied with the unit

**Warning:** 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/>.

---

## 3 Overview

The **FC-132ETH** is an advanced serial communication matrix, and a bidirectional serial to Ethernet control-signals converter.

The unit acts as a gateway between Ethernet and massive numbers of RS-232 controlled devices. Also, it can be used to add a serial data routing layer to our modular matrices populated with DGKat or other cards with data-embedding features.

The **FC-132ETH** has 33 RS-232 ports, one of which can be used for RS-485 communication. Into one or more of these ports serial data can be switched from any of the eight RS-232 data ports or from a pre-configured, virtual Ethernet connection. Depending on the routing of the matrix, one-to-one bidirectional communication or one-to-many unidirectional communication is supported.

The **FC-132ETH** can be controlled using the front panel buttons, a serial controller, or by the intuitive, feature-loaded Web pages supported by all major Web browsers which makes it possible to access the **FC-132ETH** from mobile devices, PCs and MACs.

In particular, the **FC-132ETH** features:

- Eight RS-232, bidirectional input Data ports
- 32 RS-232, bidirectional/unidirectional output ports
  - Note:** A switched link acts bidirectionally only when there is one-to-one routing. When an input is switched to more than one output, that link operates unidirectionally
- One Ethernet control/data port
- One RS-232 local control port
- One dual-function RS-232/RS-485 port
- Selectable static or dynamic IP addressing (DHCP)
- Configurable serial data parameters, (for example, baud rate and parity)
- An easy to read LCD display
- A lock button to prevent unwanted tampering with the buttons on the front



panel

- Support for Protocol 3000
- A virtual-port software application
- Web-page control with password authentication for making changes to settings
- An internal clock for accurate logs and time-stamping

The **FC-132ETH** includes the Virtual Serial Port Manager (Kramer VSPM) for compatibility with applications based on COM-port communication. The virtual serial port:

- Makes the **FC-132ETH** compatible with all Windows® based applications that work using a physical COM port. This includes all versions of **K-Router** and other Kramer control applications. It enables you to operate all RS-232 and RS-485 controllable devices over an Ethernet LAN using their existing PC software
- Operates like a physical hardware port, that is, a logical COM that behaves like a standard hardware port but in reality transparently reroutes the data using the TCP/IP network to the **FC-132ETH** interface via a virtual null-modem connection, which you can emulate over Ethernet or the Internet
- Can be created in any quantity on your PC and does not occupy an actual serial port

You can control the **FC-132ETH** using the front panel buttons, or remotely via:

- RS-232 serial commands transmitted by a PC, touch screen system or other serial controller
- A PC connected to the Ethernet port on the device via a LAN

# 4 Defining the FC-132ETH 33x9 Serial/Data Router

Figure 1 defines the front panel of the FC-132ETH.

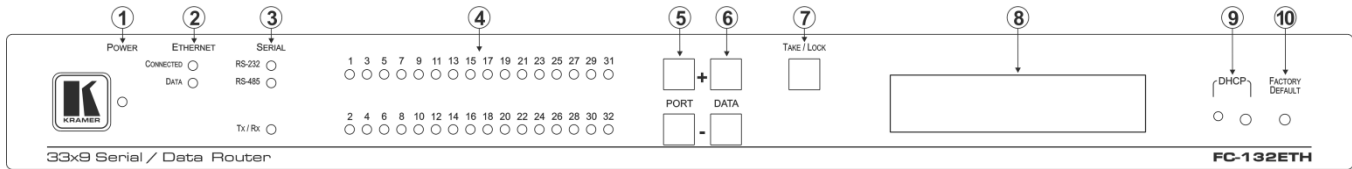


Figure 1: FC-132ETH 33x9 Serial/Data Router Front Panel

#	Feature		Function
1	POWER LED		Lights green when the device is powered on
2	ETHERNET LEDs	CONNECTED	Lights orange when the Ethernet port is connected to another device (see <a href="#">Section 7.2</a> )
		DATA	Flashes green when data are being transferred on the Ethernet link
3	SERIAL LEDs	RS-232	Lights green when port number 33 is set to RS-232 mode (see <a href="#">RS-232 RS-485</a> Button)
		RS-485	Lights green when port number 33 is set to RS-485 mode
		Tx/Rx	Flashes green when data are being transferred over the RS-232/RS-485 link. Flashes red when serial data is being received. Flashes orange when serial data is being transmitted and received
4	RS-232 Ports LEDs 1~32		Flashes green when serial data is being transmitted. Flashes red when serial data is being received. Flashes orange when serial data is being transmitted and received
5	PORT Buttons	+	Press to step up through the output data ports for selection (see <a href="#">Section 8.1</a> )
		-	Press to step down through the output data ports for selection
6	DATA Buttons	+	Press to step up through the input data ports for selection (see <a href="#">Section 8.1</a> )
		-	Press to step down through the input data ports for selection

#	Feature		Function
7	TAKE/LOCK Button		Press briefly to activate a switching selection (see <a href="#">Section 8.1</a> ). Press and hold for five seconds to lock/unlock the front panel buttons (see <a href="#">Section 8.2</a> )
8	LCD Display 2 x 20		Displays the contextual messages. Automatically blanks after 30 seconds
9	DHCP	LED	Lights green to indicate DHCP is active
		Button	Press to activate DHCP. Press again to deactivate DHCP (see <a href="#">Section 10.4</a> )
10	FACTORY DEFAULT Button		Press and hold while powering the device on to reset the device to the factory default values (see <a href="#">Section 10.4</a> )

[Figure 2](#) defines the rear panel of the **FC-132ETH**.

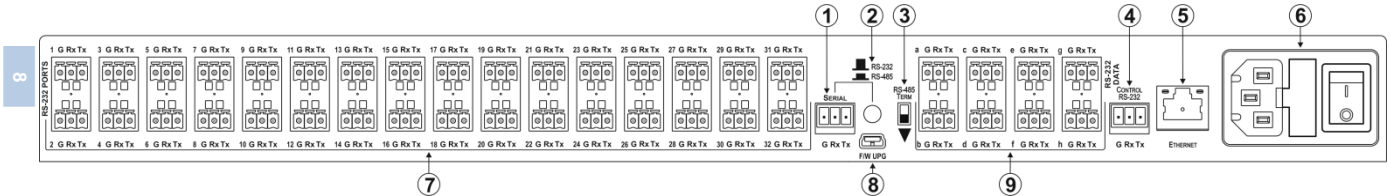


Figure 2: FC-132ETH 33x9 Serial/Data Router Rear Panel

#	Feature	Function
1	<i>SERIAL</i> RS-232/RS-485 3-pin Terminal Block	Connect to the device to be controlled serially, (for example, the VS-3232DN). When set to RS-232, (see <a href="#">RS-232 RS-485 Button</a> ), this port can be used as input port number 33
2	<i>RS-232 RS-485</i> Button	Release the button to set the port to RS-232 mode. Depress the button to set the port to RS-485 mode
3	<i>RS-485 TERM</i> Switch	Slide down to terminate the RS-485 bus. Slide up to leave the RS-485 bus unterminated (see <a href="#">Section 10.1</a> )
4	<i>CONTROL RS-232</i> 3-pin Terminal Block	Connect to a serial controller (see <a href="#">Section 7.1</a> )
5	<i>ETHERNET</i> RJ-45 Connector	Connect to a PC via a LAN (see <a href="#">Section 7.2</a> )
6	Mains Power Connector, Fuse and Power Switch	Plug in the power cord and switch the device on and off
7	<i>RS-232 PORTS</i> Outputs 1~32 3-pin Terminal Blocks	Connect to up to 32 serial destination devices, (see <a href="#">Section 6</a> )
8	<i>F/W UPG</i> Mini USB Connector	For the use of Kramer service personnel only (see <a href="#">Section 10.5</a> )
9	<i>RS-232 DATA</i> Serial Outputs a~h 3-pin Terminal Blocks	Connect to up to eight serial source devices

## 5 Installing in a Rack

This section provides instructions for rack mounting the unit.

**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



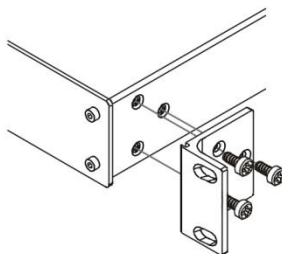
### CAUTION!

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 Initial Configuration and Use Overview

This chapter provides an overview of the initial configuration and basic operation of the **FC-132ETH**. The chapter comprises:

- Configuring the **FC-132ETH** (see [Section 6.1](#))
- Configuring a virtual port on the PC (see [Section 6.2](#))
- Configuring an Ethernet connection on the PC (see [Section 6.3](#))
- Switching ports on the **FC-132ETH** (see [Section 6.4](#))

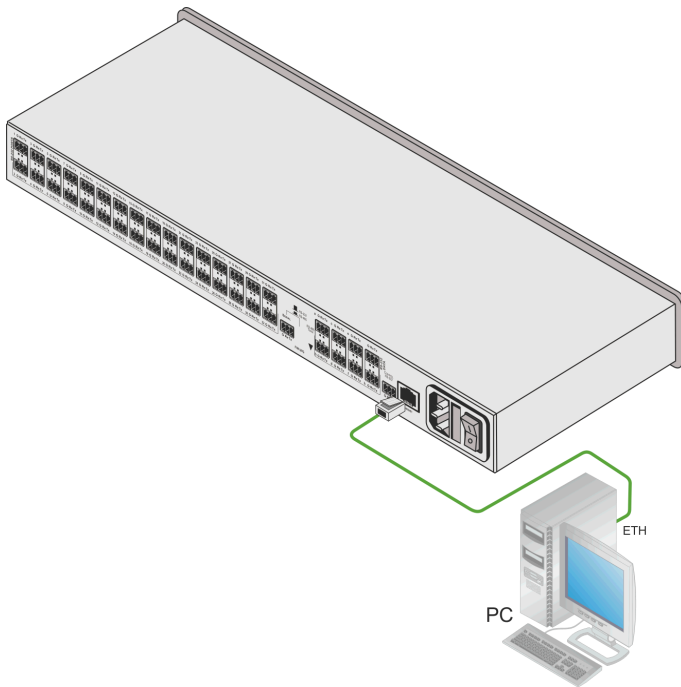


Figure 3: Connecting the FC-132ETH for Initial Configuration

## 6.1 Configuring the FC-132ETH

### To configure the FC-132ETH:

1. Connect the Ethernet port on the rear panel of the **FC-132ETH** to a PC either directly (see [Section 7.2](#)) or via a LAN.
2. Using a Web browser, (see [Section 9](#) and [Section 11](#)) browse to the General Info home page (see [Figure 10](#)).
3. Click on Device Settings to browse to the Device Settings page, (see [Figure 13](#)).
4. Enter the time and date manually, or enter the Time server address for automatic time and date synchronization.
5. Click Save Changes.
6. Click on Communication to browse to the Communication page, (see [Figure 14](#)).
7. Enter the IP address, mask and gateway for static IP addressing and Click Set.  
—Or—  
Click DHCP On for dynamic IP addressing.  
**Note:** If you have changed the IP from the default setting, you must reload the General Info home page again using the new IP address.
8. Click on Serial Ports Settings to browse to the Serial Port Settings page, (see [Figure 15](#)).
9. Associate the required serial ports with their corresponding TCP/UDP settings.
10. For each associated serial port, enter the serial port configuration parameters using the drop-down lists under Serial Configuration.
11. Click Save Changes.

12. If required, click on Security to browse to the Security page.
13. Click ON to activate security.  
The user name and password credentials popup appears.
14. Enter the required user name and password.

## 6.2 Configuring a Virtual Port on the PC

If the control application cannot work with an Ethernet driver, download the Kramer VSPM from our Web site to set a virtual port for each local port on your **FC-132ETH**.

The **Kramer VSPM** software lets you emulate virtual ports which normally would be present in the machine hardware. After setup, the virtual port lets you control Kramer machines via your PC.

## 6.3 Configuring an Ethernet Connection on the PC

If the control application can directly connect to the Ethernet driver, select the host IP and port number according to your **FC-132ETH** configuration, as illustrated in [Figure 4](#).

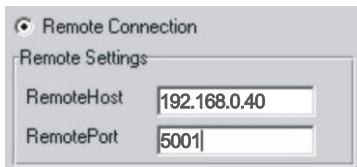


Figure 4: The Port Window – Selecting a Remote Connection

## 6.4 Switching Ports on the FC-132ETH

You can switch ports either locally using the front panel buttons or remotely using the Web pages, (see [Section 9.3](#)).

**To switch ports locally on the FC-132ETH:**

1. Select the required output Port using the + and – Port buttons.  
The Data buttons flash and the selected output is displayed on the readout.



2. Select the required input Data connection using the + and – Data buttons.  
The selected Data connection is displayed on the readout and the Take button flashes.
3. Press Take/Lock to save the selection.

## 7 Connecting the FC-132ETH 33x9 Serial/Data Router



Switch off the power to all devices before connecting them to your **FC-132ETH**. After connecting your **FC-132ETH**, connect its power and then switch on the power to each device.

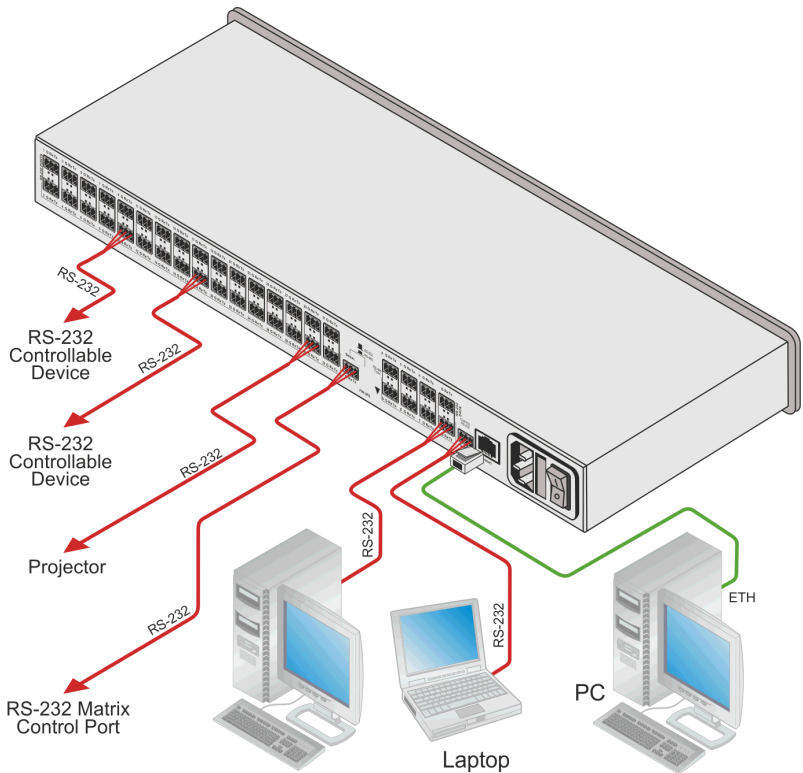


Figure 5: Connecting the FC-132ETH 33x9 Serial/Data Router

To connect the FC-132ETH as illustrated in the example in [Figure 5](#):

1. Connect up to eight serial controllers/serial data sources, (for example, Personal Computers) to the 3-pin, terminal block, RS-232 Data connectors.

2. Connect a serial controller, (for example, a laptop) to the Control RS-232 port.
3. Connect the device to a LAN using the RJ-45 Ethernet connector.
4. Connect up to 32 serial data destination devices, (for example, projectors or matrix switchers) to the 3-pin, terminal block, RS-232 Ports connectors.
5. Connect a device to be controlled using RS-232 serial data, (for example, a matrix switcher) to the 3-pin, terminal block, Serial port.
6. Connect the device to the mains electricity (not shown in [Figure 5](#)) and power the device on.

## 7.1 Connecting to the FC-132ETH 33x9 Serial/Data Router via RS-232

You can connect to the **FC-132ETH** via an RS-232 connection using, for example, a PC.

**To connect to the FC-132ETH via RS-232:**

- Connect the Control RS-232 3-pin, terminal block connector on the rear panel of the **FC-132ETH** unit via a 3-wire cable (pin TX to pin 2, RX to pin 3, and G to pin 5) to the RS-232 9-pin D-sub port on your PC

## 7.2 Connecting to the FC-132ETH 33x9 Serial/Data Router via Ethernet

You can connect to the **FC-132ETH** via Ethernet using either of the following methods:

- Directly to the PC using a crossover cable (see [Section 7.2.1](#))
- Via a network hub, switch, or router, using a straight-through cable (see [Section 7.2.2](#))

**Note:** If you want to connect via a router and your IT system is based on IPv6, speak to your IT department for specific installation instructions.

## 7.2.1 Connecting the Ethernet Port Directly to a PC

You can connect the Ethernet port of the **FC-132ETH** directly to the Ethernet port on your PC using a crossover cable with RJ-45 connectors.



This type of connection is recommended for identifying the with the factory configured default IP address.

After connecting the **FC-132ETH** to the Ethernet port, configure your PC as follows:

1. Click **Start > Control Panel > Network and Sharing Center**.
2. Click **Change Adapter Settings**.
3. Highlight the network adapter you want to use to connect to the device and click **Change settings of this connection**.

The Local Area Connection Properties window for the selected network adapter appears as shown in [Figure 6](#).

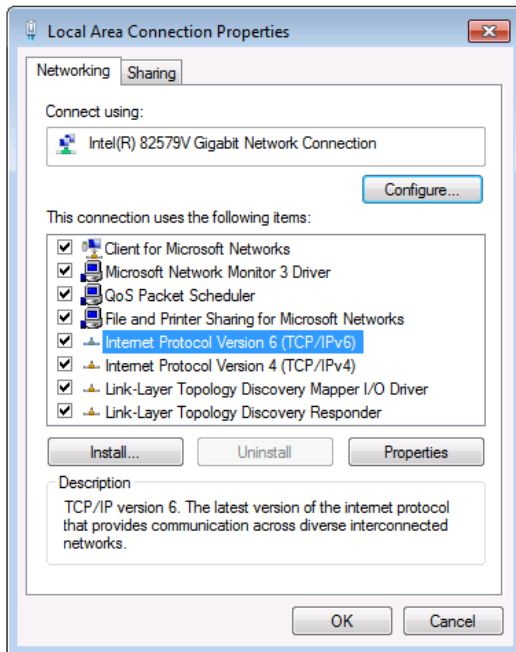


Figure 6: Local Area Connection Properties Window

4. Highlight either **Internet Protocol Version 6 (TCP/IPv6)** or **Internet Protocol Version 4 (TCP/IPv4)** depending on the requirements of your IT system.

5. Click **Properties**.

The Internet Protocol Properties window relevant to your IT system appears as shown in [Figure 7](#) or [Figure 8](#).

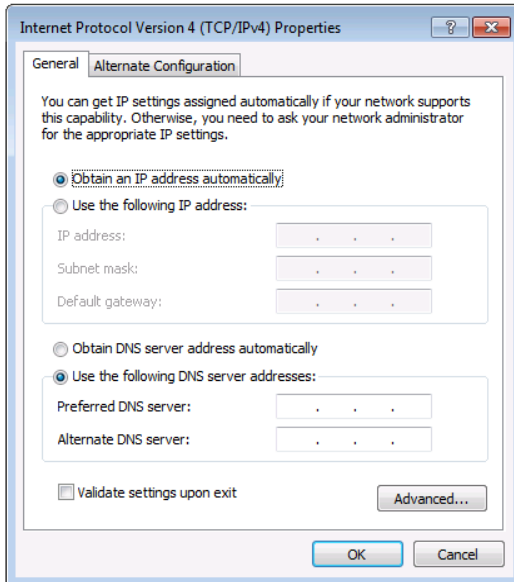


Figure 7: Internet Protocol Version 4 Properties Window

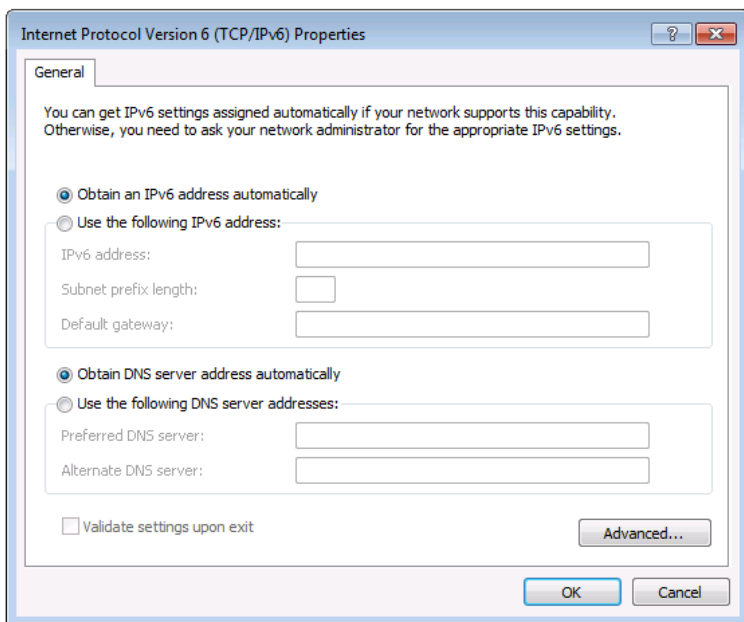


Figure 8: Internet Protocol Version 6 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in [Figure 9](#).

For TCP/IPv4 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.

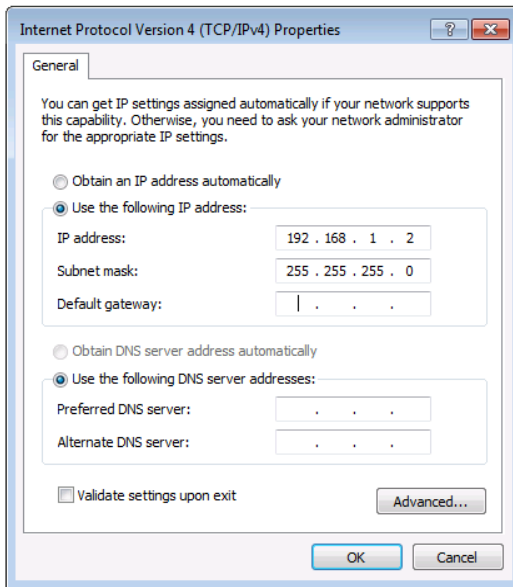


Figure 9: Internet Protocol Properties Window

7. Click **OK**.
8. Click **Close**.

### 7.2.2 Connecting the Ethernet Port via a Network Hub or Switch

You can connect the Ethernet port of the **to** the Ethernet port on a network hub or using a straight-through cable with RJ-45 connectors.

---

## 8 Operating the FC-132ETH Locally

This section describes:

- Switching a Data connection to an output Port (see [Section 8.1](#))
- Locking the front panel buttons (see [Section 8.2](#))

### 8.1 Switching a Data Connection to an Output Port

**To switch a Data connection to an output Port:**

1. Select the required output Port using the + and – Port buttons.  
The Data buttons flash and the selected output is displayed on the readout.
2. Select the required input Data connection using the + and – Data buttons.  
The selected Data connection is displayed on the readout and the Take button flashes.
3. Press Take/Lock to save the selection.  
If you do not press the Take/Lock button within 30 seconds the selection is not saved and the display reverts to the standby blank display.

### 8.2 Locking and Unlocking the Front Panel Buttons

**To lock and unlock the front panel buttons:**

1. Press and hold the unlit Take/Lock button for five seconds.  
The front panel buttons are locked. Pressing any of the front panel buttons causes the Lock button to flash a few times.
2. Press and hold the lit Take/Lock button for five seconds.  
The front panel buttons are unlocked.



---

## 9 Operating the FC-132ETH Remotely via the Web Pages

The embedded Web pages can be used to remotely operate the **FC-132ETH** using a Web browser and an Ethernet connection.

Before attempting to connect:

- Perform the procedures in [Section 7.2](#).
- Ensure that your browser is supported (see [Section 11](#))

### 9.1 Browsing the FC-132ETH Web Pages

**Note:** In the event that a Web page does not update correctly, clear your Web browser's cache (by pressing CTRL-F5).

**To browse the FC-132ETH Web pages:**

1. Open your Internet browser.
2. Type the device's IP number (see [Section 12](#)) in the Address bar of your browser.



The Loading page appears followed shortly by the General Info page shown in [Figure 10](#).

The General info page displays the following:

- Model Name
- Firmware version
- Device serial number
- Web page version

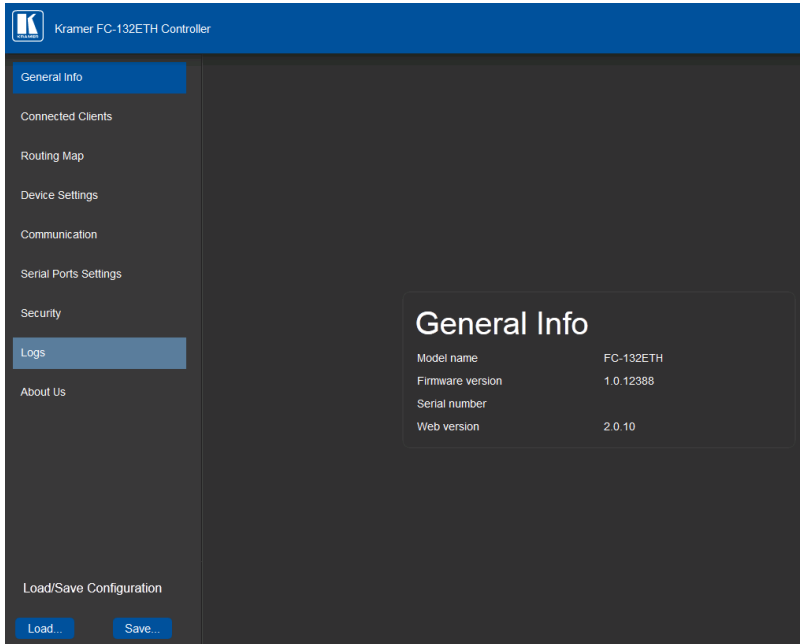


Figure 10: General Info Page

At the bottom left hand side of all pages there are Load/Save Configuration buttons. These allow you to save the current configuration and load any presaved configurations.

## 9.2 Connected Clients Page

The Connected Clients page allows you to view the following details of any client devices connected via Ethernet to the **FC-132ETH**:

- IP address
- The port it is connected to
- Method of connection
- Whether or not Send Replies is enabled for the port, (see [Section 9.6](#))

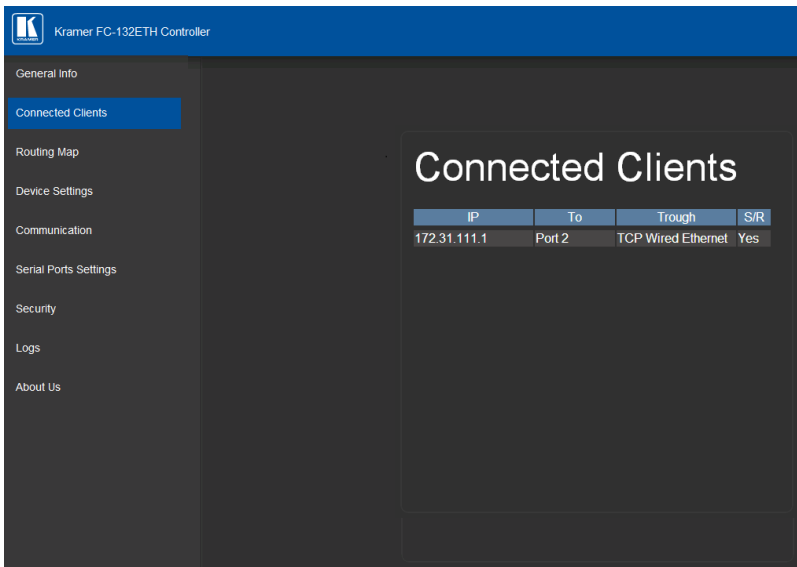


Figure 11: Connected Clients Page

### 9.3 Routing Map Page

The Routing Map page shows the current switching state and allows you to switch input and output ports, either graphically by clicking on the table, or by selection using the drop-down lists.

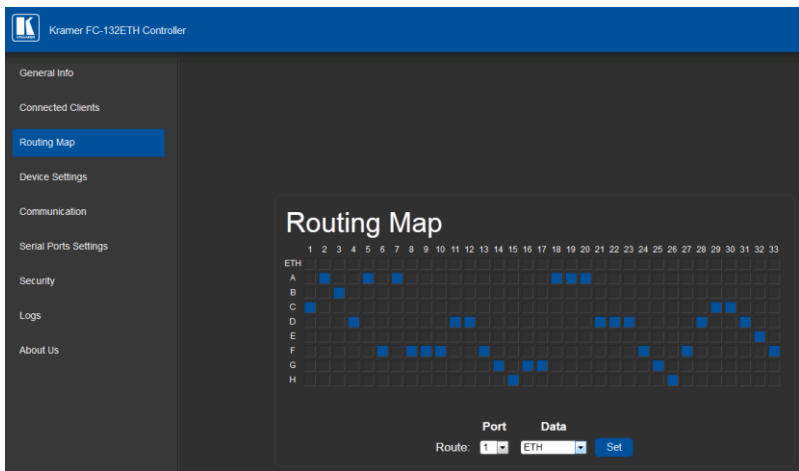


Figure 12: Serial Port Settings Page

### 9.4 Device Settings Page

The Device Settings page allows you to view the Model name and Time server status, and to modify the following fields:

- Device name
- Time and date automatically using a Time Server (if the device is connected to the Internet), including the Time Zone and daylight savings time
- Time and date manually

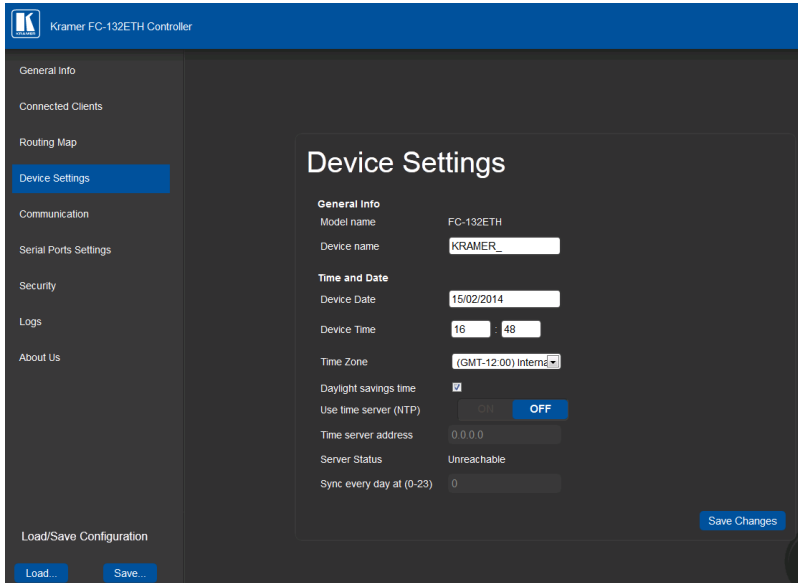


Figure 13: Device Settings Page

The **FC-132ETH** has a built-in clock that can synchronize with a Time Server if required.

**To enable Time Server synchronization:**

1. Browse to the Device Settings page by clicking Device Settings.  
The Device Settings page is displayed as shown in [Figure 13](#).
2. Click the Use Time Server ON button.
3. Enter the IP address of the Time Server.
4. Enter the time of day at which the **FC-132ETH** should synchronize with the Time Server.
5. Click Save Changes.

## 9.5 Communication Page

The communication page allows you to:

- Set the RS-232 baud rate (for the control port)
- Turn DHCP on and off
- Edit the IP settings for static IP

The screenshot shows the web interface of the Kramer FC-132ETH Controller. The top navigation bar is blue with the Kramer logo and the text "Kramer FC-132ETH Controller". On the left, a dark sidebar contains a menu with the following items: "General Info", "Connected Clients", "Routing Map", "Device Settings", "Communication" (highlighted in blue), "Serial Ports Settings", "Security", "Logs", and "About Us". The main content area has a dark background and is titled "Communication" in large white text. Below the title, there are two sections: "R232" and "Ethernet". The "R232" section has a "Baud rate" dropdown menu set to "115200". The "Ethernet" section has a "DHCP" toggle switch set to "OFF" (with "ON" in grey and "OFF" in blue). Below this are three input fields for "IP address" (192.168.1.39), "Mask" (255.255.0.0), and "Gateway" (192.168.0.1), each with a "Set" button to its right. At the bottom, the "MAC" address is displayed as "08-12-34-dd-aa-cc".

Figure 14: Communication Page

## 9.6 Serial Port Settings Page

The Serial Port Settings page allows you to set the parameters that will be used when the port is switched to an Ethernet port and also allows you to:

- Set the following Ethernet parameters for each of the 33 serial ports. These parameters must be used to address the serial port form and Ethernet host:
  - Select TCP or UDP
  - IP port label
  - TCP keep alive time: 0-3600sec (default 60sec) time interval, after-which detected idle connection is disconnected
- Set the following serial parameters for each serial port. These parameters must be used when data arrives at the port from an Ethernet connection using the above-mentioned Ethernet settings:
  - Parity
  - Data bits
  - Baud rates
  - Stop bits

**Note:** When switched to one of the local 1-8 serial inputs, these settings are not used).

- Select whether or not to send replies on the port to the new client

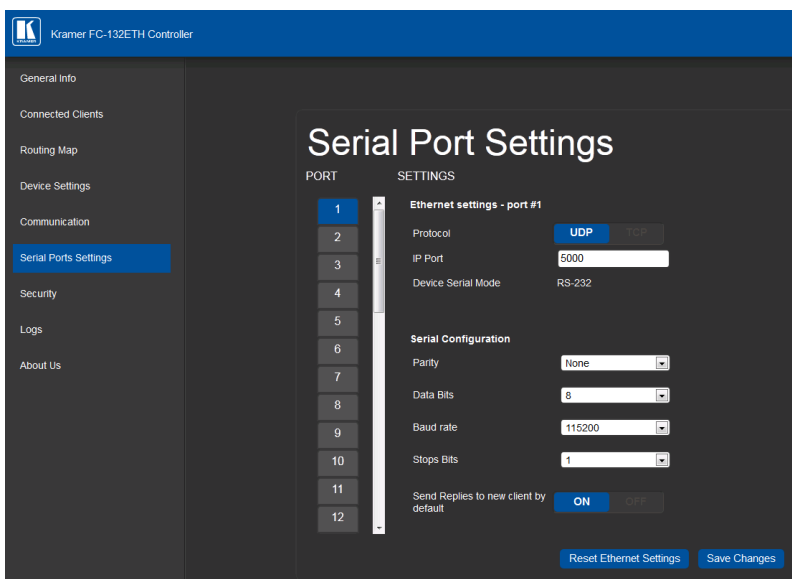


Figure 15: Serial Port Settings Page

## 9.7 Security Page

The Security page allows you to turn the security for the device on or off.

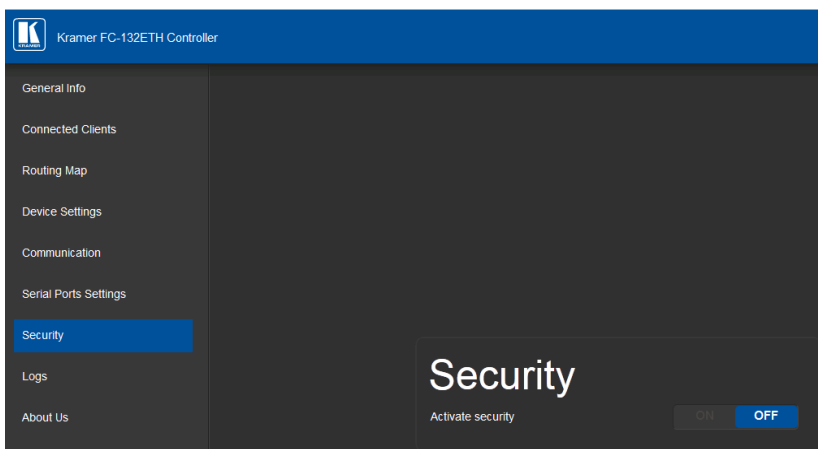


Figure 16: Security Page



When security is on, access to the Web pages is only granted on submission of a valid user and password. The default credentials are “admin” and no password.

**To activate Web page security:**

1. On the Security page, click ON.

The confirmation popup is displayed as shown in [Figure 17](#).

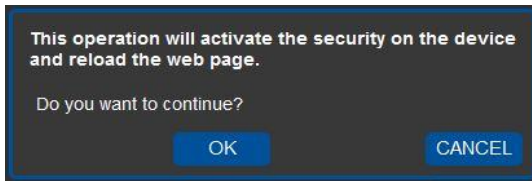


Figure 17: Security Confirmation Popup

2. Click OK.

The Authentication Required popup is displayed as shown in [Figure 18](#).

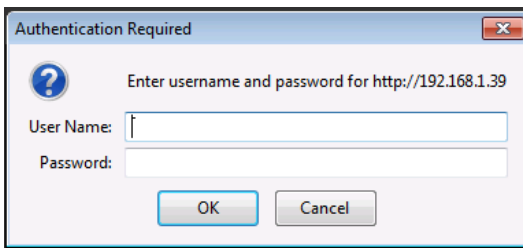


Figure 18: Authentication Required Popup

3. Enter the default User Name and Password.
4. Click OK.
5. Wait until the Web pages have reloaded and click to browse to the Security page.

The page show in [Figure 19](#) is displayed.

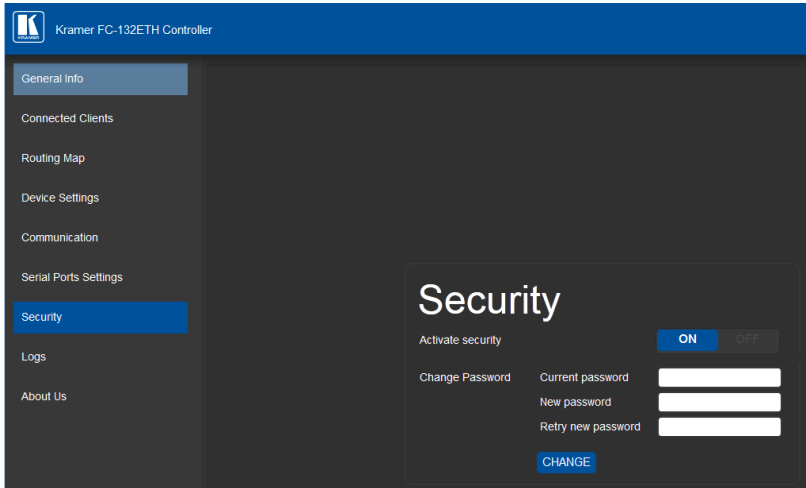


Figure 19: Security Activated Page

6. If required, turn security off by clicking OFF or change the password and click Change.

# 9.8 Logs Page

The Logs page allows you to:

- View current logs
- Configure the logs
- Filter the logs

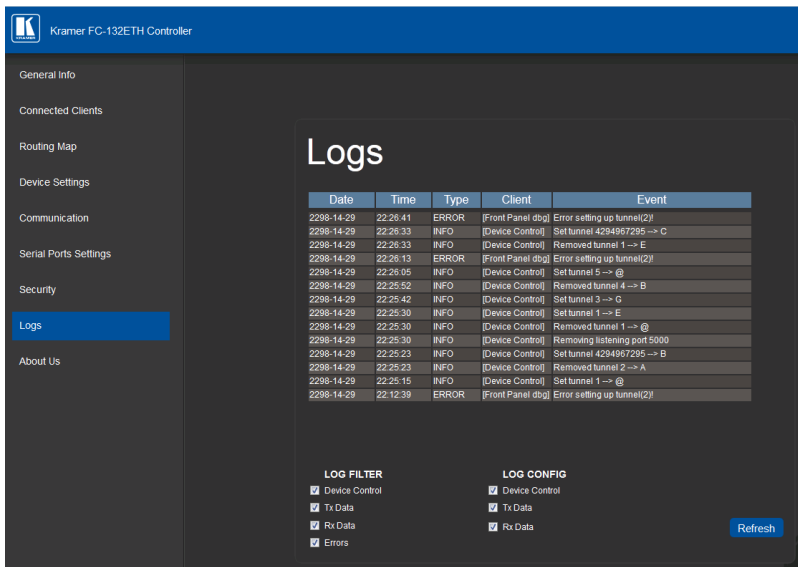


Figure 20: Logs Page

The display is not updated automatically. Click Refresh to update the display.

Use the Log Config check-boxes to select which events are recorded. Use the Log Filter check-boxes to select which events to display from the log.

## 9.9 About Us Page

The About Us page displays the Web page version and the Kramer company details.

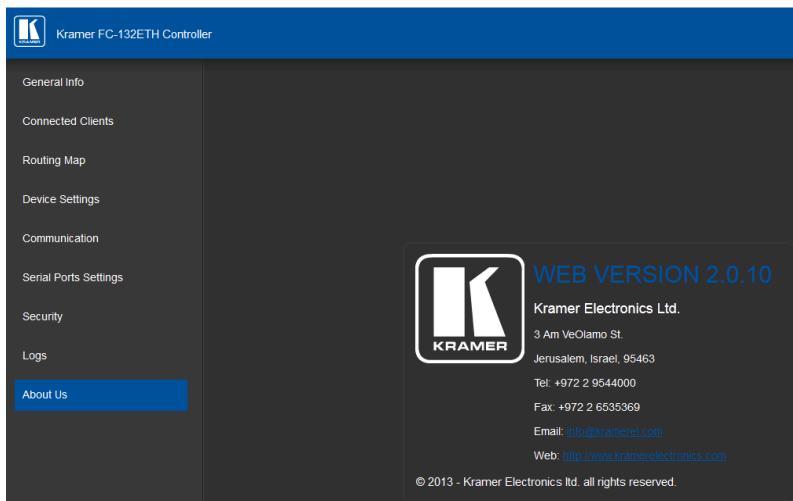


Figure 21: About Us Page

---

## 10 Configuring and Maintaining the FC-132ETH

This section describes:

- Terminating the RS-485 bus (see [Section 10.1](#))
- Selecting the RS-232/RS-485 Port (see [Section 10.2](#))
- Activating and deactivating DHCP (see [Section 10.3](#))
- Resetting to the factory default settings (see [Section 10.4](#))
- Upgrading the firmware (see [Section 10.5](#))

### 10.1 Terminating the RS-485 Bus

The devices at both ends of the RS-485 chain must be terminated; all other devices in the chain must be left unterminated.

**To terminate the RS-485 bus:**

- Slide the RS-485 Term switch down

### 10.2 Selecting the RS-232 or RS-485 Port

The 3-pin Serial terminal block can be used as either an RS-232 or as an RS-485 port.

**To set the Serial port as an RS-232 port:**

- Release the RS-232/RS-485 button on the rear panel.  
The Serial RS-232 LED lights and selection is shown on the display

**To set the Serial port as an RS-485 port:**

- Depress the RS-232/RS-485 button on the rear panel.  
The Serial RS-485 LED lights and the selection is shown on the display

### 10.3 Activating and Deactivating DHCP

The IP address of the **FC-132ETH** can be set either statically or dynamically where it is issued by a DHCP server.

#### **To activate and deactivate DHCP:**

1. Press the DHCP button on the front panel.  
DHCP is activated, the DHCP LED lights green and the selection is shown on the display.
2. Press the DHCP button again.  
DHCP is deactivated, the DHCP LED no longer lights and the selection is shown on the display.

## **10.4 Resetting to the Factory Default Settings**

To reset the device to its factory default settings:

1. Turn off the power to the device.
2. Press and hold the Reset button on the front panel.
3. Turn on the power to the device while holding down the Reset button for a few seconds.
4. Release the button.  
The device is reset to the factory default settings.

## **10.5 Upgrading the Firmware**

For instructions on upgrading the firmware see the "*Kramer K-Upload User Manual*".

# 11 Technical Specifications

PORTS:	"Ports" 8 RS-232 Serial Data connections on 3-pin terminal blocks 1 Ethernet on an RJ-45 connector 1 RS-232 Control port on a 3-pin terminal block "Data" 32 RS-323 Serial Ports on 3-pin terminal blocks 1 RS-232/RS-485 Dual-use port on a 3-pin terminal block
RS-232 COMMUNICATION:	Transparent up to 115200bps
SUPPORTED WEB BROWSERS:	Microsoft IE V9.0 and higher Google Chrome Firefox V3.0 and higher
OVERALL DEVICE BAUDRATE SUPPORT:	310kbps
POWER CONSUMPTION:	100–240V AC, 50/60Hz, 17VA
CONTROLS:	Front panel buttons, RS-232, RS-485, Ethernet
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" x 7.24" x 1U (W, D, H)
WEIGHT:	1.48kg (3.26lbs) approx.
ACCESSORIES:	Power cord, rack "ears"
Specifications are subject to change without notice at <a href="http://www.kramerelectronics.com">http://www.kramerelectronics.com</a>	

## 11.1 Data Handling Performance

The **FC-132ETH** is designed to support mainly AV-relevant RS-232 communication.

The device has an overall data bandwidth limit which should be high enough in most AV installations to support the required communication bandwidth.

In extremely demanding cases, we recommend that you take into account the bandwidth limitation.

The total sustained data bandwidth that the device can handle for all ports simultaneously is 310kbps

## 11.2 Example Bandwidth Calculation

The **FC-132ETH** has 33 serial ports. When used at the same time, each serial port can support up to:

- $310\text{kbps} / 33 = 9.3\text{kbps}$

If each of your protocol commands is 100 bytes, (that is, 800bits), you can safely send and/or receive a minimum of 12 of these commands per second on each serial port ( $(310\text{kbps} * 1024) / 800\text{bits} / 33 = 12$ ). A similar calculation applies when fewer ports are used at the same time; in this case higher bandwidth per port can be achieved.

In critical applications requiring a lossless data transfer, we recommend that communication on all the other ports is stopped when making a long file transfer (for example, when performing a firmware upgrade via one of the serial ports).



# 12     Default Communication Parameters

RS-232	
Protocol 3000 (Default)	
Baud Rate:	115,200
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	ASCII
Example (Output 1 to Input 1):	#AV 1>1<CR>

Ethernet	
IP Address:	192.168.1.39
TCP Port #:	5000
UDP Port #:	50000

# 13 Protocol 3000

The **FC-132ETH** can be operated using serial commands from a PC, remote controller or touch screen using the Kramer Protocol 3000. This section describes:

- Kramer Protocol 3000 syntax (see [Section 13.1](#))
- Kramer Protocol 3000 commands (see [Section 13.2](#))
- Kramer Protocol 3000 detailed commands (see [Section 13.3](#))

## 13.1 Kramer Protocol 3000 Syntax

### 13.1.1 Host Message Format

Start	Address (optional)	Body	Delimiter
#	<i>Destination_id@</i>	<b>Message</b>	<b>CR</b>

#### 13.1.1.1 Simple Command

Command string with only one command without addressing:

Start	Body	Delimiter
#	<b>Command</b> <b>SP</b> <i>Parameter_1,Parameter_2,...</i>	<b>CR</b>

#### 13.1.1.2 Command String

Formal syntax with commands concatenation and addressing:

Start	Address	Body	Delimiter
#	<i>Destination_id@</i>	<b>Command_1</b> <i>Parameter1_1,Parameter1_2,... </i> <b>Command_2</b> <i>Parameter2_1,Parameter2_2,... </i> <b>Command_3</b> <i>Parameter3_1,Parameter3_2,... ...</i>	<b>CR</b>

### 13.1.2 Device Message Format

Start	Address (optional)	Body	delimiter
~	<i>Sender_id@</i>	<b>Message</b>	<b>CR LF</b>

#### 13.1.2.1 Device Long Response

Echoing command:

Start	Address (optional)	Body	Delimiter
-------	--------------------	------	-----------

~	Sender_id@	Command	SP	[Param1 ,Param2 ...]	result	CR	LF
---	------------	---------	----	----------------------	--------	----	----

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

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

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

### 13.1.3 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 device response

#### Device address (Optional, for K-NET)

K-NET Device ID followed by '@'

#### Query sign

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

#### Message closing character

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

**CRLF** – For device 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.

## 13.1.4 Entering Commands

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

## 13.1.5 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.

## 13.1.6 Chaining Commands

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.

## 13.1.7 Maximum String Length

64 characters

## 13.2 Kramer Protocol 3000 Commands

Command	Description
#	Protocol handshaking
BUILD-DATE?	Get device build date
HELP	Get command list or help for specific command
LOGIN?	Set/get protocol permission
LOGOUT	Cancel current permission level
MACH-NUM	Set the machine number
MODEL?	Get device model
NAME	Set/get machine (DNS) name
NAME-RST	Reset machine (DNS) name to factory default
NET-DHCP	Set/get DHCP mode
NET-GATE	Set/get gateway IP address
NET-IP	Set/get device IP address
NET-MAC?	Get the MAC address
NET-MASK	Set/get the subnet mask
PASS	Set/get password for login level
PROT-VER?	Get device protocol version
RESET	Reset device
ROUTE	Set/get layer routing
SECUR	Set/get security state
SN?	Get device serial number
TIME	Set/get the time and date
TIME-LOC	Set/get local time offset from UTC/GMT
TIME-SRV	Set/get time synchronization from server
VERSION?	Get device firmware version

### 13.3 Kramer Protocol 3000 – Detailed Commands

This section lists the detailed commands applicable to the **FC-132ETH**.

Command - #		Command Type - System-mandatory	
Command Name		Permission	Transparency
Set:	#	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Protocol handshaking	# <div>CR</div>	
Get:	-	-	
Response			
~ <div>nn</div> @ <div>SP</div> <div>OK</div> <div>CR LF</div>			
Parameters			
Response triggers			
Notes			
Use to validate the Protocol 3000 connection and get the machine number			

Command - BUILD-DATE?		Command Type - System-mandatory	
Command Name		Permission	Transparency
Set:	-	-	-
Get:	BUILD-DATE?	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get device build date	#BUILD-DATE <code>CR</code>	
Response			
~ <code>nn</code> @BUILD-DATE <code>SP</code> date <code>SP</code> time <code>CR</code> LF			
Parameters			
date - Format: YYYY/MM/DD where YYYY = Year, MM = Month, DD = Day			
time - Format: hh:mm:ss where hh = hours, mm = minutes, ss = seconds			
Response triggers			
Notes			

Command - <b>HELP</b>		Command Type - System-mandatory	
Command Name		Permission	Transparency
Set:	-	-	-
Get:	<b>HELP</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get command list or help for specific command	2 options: 1. <b>#HELP</b> <input type="text"/> 2. <b>#HELP</b> <input type="text"/> command_name <input type="text"/>	
Response			
1. Multi-line: ~nn@Device available protocol 3000 commands : <input type="text"/> command <input type="text"/> command... <input type="text"/> <b>To get help for command use: HELP (COMMAND_NAME)</b> <input type="text"/>			
2. Multi-line: ~nn@HELP <input type="text"/> command : <input type="text"/> description <input type="text"/> <b>USAGE</b> : usage <input type="text"/>			
Parameters			
Response triggers			
Notes			

Command - LOGIN		Command Type - Authentication	
Command Name		Permission	Transparency
Set:	LOGIN	Not Secure	Public
Get:	LOGIN?	Not Secure	Public
Description		Syntax	
Set:	Set protocol permission	#LOGIN <sub>SP</sub> login_level,password <sub>CR</sub>	
Get:	Get protocol permission level	#LOGIN? <sub>CR</sub>	
Response			
Set: ~nn@LOGIN <sub>SP</sub> login_level,password <sub>SP</sub> OK <sub>CR LF</sub> or ~nn@LOGIN <sub>SP</sub> ERR <sub>SP</sub> 004 <sub>CR LF</sub> (if bad password entered) Get: ~nn@LOGIN <sub>SP</sub> login_level <sub>CR LF</sub>			
Parameters			
login_level - level of permissions required (End User or Admin) password - predefined password (by PASS command). Default password is an empty string			
Response triggers			
Notes			
For devices that support security, LOGIN allows to the user to run commands with an End User or Administrator permission level In each device, some connections can be logged in to different levels and some do not work with security at all Connection may logout after timeout The permission system works only if security is enabled with the “SECUR” command			



Command - LOGOUT		Command Type - Authentication	
Command Name		Permission	Transparency
Set:	LOGOUT	Not Secure	Public
Get:	-	-	-
Description		Syntax	
Set:	Cancel current permission level	#LOGOUT[CR]	
Get:	-	-	
Response			
~[hn]@LOGOUT[SP]OK[CR LF]			
Parameters			
Response triggers			
Notes			
Logs out from End User or Administrator permission levels to Not Secure			

Command - MACH-NUM		Command Type - System	
Command Name		Permission	Transparency
Set:	MACH-NUM	End User	Public
Get:	-	-	-
Description		Syntax	
Set:	Set machine number	#MACH-NUM <sub>SP</sub> machine_number <sub>CR</sub>	
Get:	-	-	
Response			
~nn@MACH-NUM <sub>SP</sub> machine_#OK <sub>CR LF</sub>			
Parameters			
machine_number - New machine number to device			
Response triggers			
Notes			
Some devices do not set the new machine number until the device is restarted Some devices can change the machine number only from DIP-switches			

Command - MODEL?		Command Type - System-mandatory	
Command Name		Permission	Transparency
Set:	-	-	-
Get:	MODEL?	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get device model	#MODEL? <input type="text"/>	
Response			
~ <input type="text"/> n <input type="text"/> @MODEL <input type="text"/> model_name <input type="text"/>			
Parameters			
model_name - String of up to 19 printable ASCII chars			
Response triggers			
Notes			

Command - <b>NAME</b>		Command Type - System (Ethernet)	
Command Name		Permission	Transparency
Set:	<b>NAME</b>	Administrator	Public
Get:	<b>NAME?</b>	End User	Public
Description		Syntax	
Set:	Set machine (DNS) name	# <b>NAME</b> <input type="text"/> machine_name <input type="text"/>	
Get:	Get machine (DNS) name	# <b>NAME?</b> <input type="text"/>	
Response			
Set: ~nn@ <b>NAME</b> <input type="text"/> machine_name <input type="text"/> OK <input type="text"/>			
Get: ~nn@ <b>NAME?</b> <input type="text"/> machine_name <input type="text"/>			
Parameters			
machine_name - String of up to 14 alpha-numeric chars (can include hyphen, not at the beginning or end)			
Response triggers			
Notes			
The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on)			

Command - <b>NAME-RST</b>		Command Type - System (Ethernet)	
Command Name		Permission	Transparency
Set:	<b>NAME-RST</b>	Administrator	Public
Get:	-	-	-
Description		Syntax	
Set:	Reset machine (DNS) name to factory default	# <b>NAME-RST</b> <input type="text"/>	
Get:	-	-	
Response			
<input type="text"/> ~ <input type="text"/> @ <b>NAME-RST</b> <input type="text"/> <input type="text"/> OK <input type="text"/>			
Parameters			
Response triggers			
Notes			
Factory default of machine (DNS) name is "KRAMER_" + 4 last digits of device serial number			

Command - <b>NET-DHCP</b>		Command Type - Communication	
Command Name		Permission	Transparency
Set:	<b>NET-DHCP</b>	Administrator	Public
Get:	<b>NET-DHCP?</b>	End User	Public
Description		Syntax	
Set:	Set DHCP mode	# <b>NET-DHCP</b> <input type="text"/> mode <input type="text"/>	
Get:	Get DHCP mode	# <b>NET-DHCP?</b> <input type="text"/>	
Response			
Set: ~nn@ <b>NET-DHCP</b> <input type="text"/> mode <input type="text"/> <b>OK</b> <input type="text"/>			
Get: ~nn@ <b>NET-DHCP</b> <input type="text"/> mode <input type="text"/> <input type="text"/>			
Parameters			
mode - 0 - Do not use DHCP. Use the IP set by the factory or using the IP set command 1 - Try to use DHCP. If unavailable, use IP as above			
Response triggers			
Notes			
Connecting Ethernet to devices with DHCP may take more time in some networks To connect with a randomly assigned IP by DHCP, specify the device DNS name (if available) using the command "NAME". You can also get an assigned IP by direct connection to USB or RS-232 protocol port if available For proper settings consult your network administrator			

Command - NET-GATE		Command Type - Communication	
Command Name		Permission	Transparency
Set:	NET-GATE	Administrator	Public
Get:	NET-GATE?	End User	Public
Description		Syntax	
Set:	Set gateway IP address	#NET-GATE <sub>[SP]</sub> ip_address <sub>[CR]</sub>	
Get:	Get gateway IP address	#NET-GATE? <sub>[CR]</sub>	
Response			
Set: ~nn@ NET-GATE <sub>[SP]</sub> ip_address <sub>[SP]</sub> OK <sub>[CR LF]</sub>			
Get: ~nn@ NET-GATE <sub>[SP]</sub> ip_address <sub>[CR LF]</sub>			
Parameters			
ip_address - format: xxx.xxx.xxx.xxx			
Response triggers			
Notes			
A network gateway connects the device via another network and maybe over the Internet. Be careful of security problems. For proper settings consult your network administrator			

Command - NET-IP		Command Type - Communication	
Command Name		Permission	Transparency
Set:	NET-IP	Administrator	Public
Get:	NET-IP?	End User	Public
Description		Syntax	
Set:	Set device IP address	#NET-IP <sub>[SP]</sub> ip_address <sub>[CR]</sub>	
Get:	Get device IP address	#NET-IP? <sub>[CR]</sub>	
Response			
Set: ~nn@ NET-IP <sub>[SP]</sub> ip_address <sub>[SP]</sub> OK <sub>[CR LF]</sub>			
Get: ~nn@ NET-IP <sub>[SP]</sub> ip_address <sub>[CR LF]</sub>			
Parameters			
ip_address - format: xxx.xxx.xxx.xxx			
Response triggers			
Notes			
For proper settings consult your network administrator			

Command - NET-MAC?		Command Type - Communication	
Command Name		Permission	Transparency
Set:	-	-	-
Get:	NET-MAC?	End User	Public
Description		Syntax	
Set:			
Get:	Get MAC address	#NET-MAC? <input type="text"/>	
Response			
~nn@NET-MAC <sup>SP</sup> mac_address <sup>CR LF</sup>			
Parameters			
mac_address - Unique MAC address. Format: XX-XX-XX-XX-XX-XX where X is hex digit			
Response triggers			
Notes			

Command - <b>NET-MASK</b>		Command Type - Communication	
Command Name		Permission	Transparency
Set:	<b>NET-MASK</b>	Administrator	Public
Get:	<b>NET-MASK?</b>	End User	Public
Description		Syntax	
Set:	Set device subnet mask	# <b>NET-MASK</b> <input type="text"/> net_mask <input type="text"/>	
Get:	Get device subnet mask	# <b>NET-MASK?</b> <input type="text"/>	
Response			
Set: ~nn@ <b>NET-MASK</b> <input type="text"/> net_mask <input type="text"/> OK <input type="text"/>			
Get: ~nn@ <b>NET-MASK</b> <input type="text"/> net_mask <input type="text"/>			
Parameters			
net_mask - format: xxx.xxx.xxx.xxx			
Response triggers			
The subnet mask limits the Ethernet connection within the local network For proper settings consult your network administrator			
Notes			

Command - PASS		Command Type - Authentication	
Command Name		Permission	Transparency
Set:	PASS	Administrator	Public
Get:	PASS?	Administrator	Public
Description		Syntax	
Set:	Set password for login level	#PASS <sub>SP</sub> login_level, password <sub>CR</sub>	
Get:	Get password for login level	#PASS? <sub>SP</sub> login_level <sub>CR</sub>	
Response			
~nn@PASS <sub>SP</sub> login_level, password <sub>SP</sub> OK <sub>CR LF</sub>			
Parameters			
login_level - level of login to set (End User or Administrator).			
password - password for the login_level. Up to 15 printable ASCII chars			
Response triggers			
Notes			
The default password is an empty string			

Command - <b>PROT-VER?</b>		Command Type - System-mandatory	
Command Name		Permission	Transparency
Set:	-	-	-
Get:	<b>PROT-VER?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get protocol version	# <b>PROT-VER?</b> <span>CR</span>	
Response			
~nn@ <b>PROT-VER</b> <span>SP</span> 3000:version <span>CR LF</span>			
Parameters			
Version - XX.XX where X is a decimal digit			
Response triggers			
Notes			

Command - RESET		Command Type - System-mandatory	
Command Name		Permission	Transparency
Set:	RESET	Administrator	Public
Get:	-	-	-
Description		Syntax	
Set:	Reset device	#RESET <sup>CR</sup>	
Get:	-	-	
Response			
~nn@RESET <sup>SP</sup> OK <sup>CR LF</sup>			
Parameters			
Response triggers			
Notes			
To avoid locking the port due to a USB bug in Windows, disconnect USB connections immediately after running this command. If the port was locked, disconnect and reconnect the cable to reopen the port.			

Command - ROUTE		Command Type - Routing	
Command Name		Permission	Transparency
Set:	ROUTE	End User	Public
Get:	ROUTE?	End User	Public
Description		Syntax	
Set:	Set layer routing	#ROUTE <sup>[SP]</sup> layer, dest, src <sup>[CR]</sup>	
Get:	Get layer routing	#ROUTE? <sup>[SP]</sup> layer, dest <sup>[CR]</sup>	
Response			
~nn@ ROUTE <sup>[SP]</sup> layer, dest, src <sup>[CR LF]</sup>			
Parameters			
layer - only layer 3 (data) is available			
dest - limits are 1-33			
src - valid values are 0-8 where 0 is Ethernet and 1-8 are A-H accordingly			
Response triggers			
Notes			
This command replaces all other routing commands.			

Command - <b>SECUR</b>		Command Type - Authentication	
Command Name		Permission	Transparency
Set:	<b>SECUR</b>	Administrator	Public
Get:	<b>SECUR?</b>	Not Secure	Public
Description		Syntax	
Set:	Start/stop security	# <b>SECUR</b> <sub>SP</sub> security_mode <sub>CR</sub>	
Get:	Get current security state	# <b>SECUR?</b> <sub>CR</sub>	
Response			
Set: ~ <sub>nn</sub> @ <b>SECUR</b> <sub>SP</sub> security_mode <sub>SP</sub> <b>OK</b> <sub>CR LF</sub>			
Get: ~ <sub>nn</sub> @ <b>SECUR</b> <sub>SP</sub> security_mode <sub>CR LF</sub>			
Parameters			
security_mode – 1/ON - enables security, 0/OFF - disables security			
Response triggers			
Notes			
The permission system works only if security is enabled with the “SECUR” command			

Command - <b>SN?</b>		Command Type - System-mandatory	
Command Name		Permission	Transparency
Set:	-	-	-
Get:	<b>SN?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get serial number	# <b>SN?</b> <span>CR</span>	
Response			
~ <span>hn</span> @ <b>SN</b> <span>SP</span> serial_number <span>CR LF</span>			
Parameters			
serial_number - 11 decimal digits, factory assigned			
Response triggers			
Notes			
For new products with 14 digit serial numbers, use only the last 11 digits			



Command - <b>TIME</b>		Command Type - System	
Command Name		Permission	Transparency
Set:	<b>TIME</b>	Administrator	Public
Get:	<b>TIME?</b>	End User	Public
Description		Syntax	
Set:	Set device time and date	# <b>TIME</b> <sub>SP</sub> day_of_week,date,time <sub>CR</sub>	
Get:	Get device time and date	# <b>TIME?</b> <sub>CR</sub>	
Response			
~nn@ <b>TIME</b> <sub>SP</sub> day_of_week, date, time <sub>SP</sub> <b>OK</b> <sub>CR LF</sub>			
Parameters			
day_of_week - one of {SUN,MON,TUE,WED,THU,FRI,SAT}			
date - Format: DD-MM-YYYY.			
time - Format: hh:mm:ss			
Response triggers			
Notes			
The year must be 4 digits			
The device does not validate the day of week from the date			
Time format - 24 hours			
Date format - Day, Month, Year			

Command - <b>TIME-LOC</b>		Command Type - System	
Command Name		Permission	Transparency
Set:	<b>TIME-LOC</b>	End User	Public
Get:	<b>TIME-LOC?</b>	End User	Public
Description		Syntax	
Set:	Set local time offset from UTC/GMT	# <b>TIME-LOC</b> <sub>SP</sub> UTC_off,DayLight <sub>CR</sub>	
Get:	Get local time offset from UTC/GMT	# <b>TIME-LOC?</b> <sub>CR</sub>	
Response			
~nn@ <b>TIME-LOC</b> <sub>SP</sub> UTC_off,DayLight <sub>CR LF</sub>			
Parameters			
UTC_off - Offset of device time from UTC/GMT (without daylight time correction)			
DayLight - 0 - no daylight saving time, 1 - daylight saving time			
Response triggers			
Notes			
If the time server is configured, device time calculates by adding UTC_off to UTC time (that it got from the time server) + 1 hour if daylight savings time is in effect			
TIME command sets the device time without considering these settings			

Command - TIME-SRV		Command Type - System	
Command Name		Permission	Transparency
Set:	TIME-SRV	End User	Public
Get:	TIME-SRV?	End User	Public
Description		Syntax	
Set:	Set time synchronization from server	#TIME-SRV <sub>SP</sub> mode, srv_ip, sync_hour <sub>CR</sub>	
Get:	Get time synchronization settings	#TIME-SRV? <sub>CR</sub>	
Response			
For Set: ~nn@TIME-SRV <sub>SP</sub> mode,srv_ip,sync_hour <sub>CR LF</sub>			
For Get: ~nn@TIME-SRV <sub>SP</sub> mode,srv_ip,server_status,sync_hour <sub>CR LF</sub>			
Parameters			
Mode - 0 - disabled, 1 - enabled			
srv_ip - time server IP address			
sync_hour - hour in day for time sync			
server_status - ON/OFF			
Response triggers			
Notes			
Device must have a valid gateway (NTGT command) and DNS server (NTDNS command)			

Command - <b>VERSION?</b>		Command Type - System-mandatory	
Command Name		Permission	Transparency
Set:	-	-	-
Get:	<b>VERSION?</b>	End User	Public
Description		Syntax	
Set:	-	-	
Get:	Get firmware version number	# <b>VERSION?</b> <span>CR</span>	
Response			
~nn@ <b>VERSION</b> <span>SP</span> firmware_version <span>CR LF</span>			
Parameters			
firmware_version - XX.XX.XXXX where the digit groups are: major.minor.build version			
Response triggers			
Notes			

# 13.4 Parameters

## 13.4.1 Layer Enumeration

Number	Value
1	Video
2	Audio
3	Data

## LIMITED WARRANTY

The warranty obligations of 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 Does this Coverage Last

Seven years as of this printing; please check our Web site for the most current and accurate warranty information.

### 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, please visit our web site at [www.kramerelectronics.com](http://www.kramerelectronics.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. You may also be directed to an authorized reseller or a person authorized by Kramer Electronics to repair the product.

If it is decided that this product should be returned directly to Kramer Electronics, this product should be properly packed, preferably in the original carton, for shipping. Cartons not bearing a return authorization number will be refused.

### Limitation on Liability

THE MAXIMUM LIABILITY OF KRAMER ELECTRONICS UNDER THIS LIMITED WARRANTY SHALL NOT EXCEED THE ACTUAL PURCHASE PRICE PAID FOR THE PRODUCT. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY. Some countries, districts or states do not allow the exclusion or limitation of relief, special, incidental, consequential or indirect damages, or the limitation of liability to specified amounts, so the above limitations or exclusions may not apply to you.

### Exclusive Remedy

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS LIMITED WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF KRAMER ELECTRONICS CANNOT LAWFULLY DISCLAIM OR EXCLUDE IMPLIED WARRANTIES UNDER APPLICABLE LAW, THEN ALL IMPLIED WARRANTIES COVERING THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY TO THIS PRODUCT AS PROVIDED UNDER APPLICABLE LAW.

IF ANY PRODUCT TO WHICH THIS LIMITED WARRANTY APPLIES IS A "CONSUMER PRODUCT" UNDER THE MAGNUSON-MOSS WARRANTY ACT (15 U.S.C.A. §2301, ET SEQ.) OR OTHER APPLICABLE LAW, THE FOREGOING DISCLAIMER OF IMPLIED WARRANTIES SHALL NOT APPLY TO YOU, AND ALL IMPLIED WARRANTIES ON THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR THE PARTICULAR PURPOSE, SHALL APPLY AS PROVIDED UNDER APPLICABLE LAW.

### Other Conditions

This limited warranty gives you specific legal rights, and you may have other rights which vary from country to country or state to state.

This limited warranty is void if (i) the label bearing the serial number of this product has been removed or defaced, (ii) the product is not distributed by Kramer Electronics or (iii) this product is not purchased from an authorized Kramer Electronics reseller. If you are unsure whether a reseller is an authorized Kramer Electronics reseller, please visit our Web site at [www.kramerelectronics.com](http://www.kramerelectronics.com) or contact a Kramer Electronics office from the list at the end of this document.

Your rights under this limited warranty are not diminished if you do not complete and return the product registration form or complete and submit the online product registration form. Kramer Electronics thanks you for purchasing a Kramer Electronics product. We hope it will give you years of satisfaction.



For the latest information on our products and a list of Kramer distributors, visit our Web site where updates to this user manual may be found.

**We welcome your questions, comments, and feedback.**

Web site: [www.kramerelectronics.com](http://www.kramerelectronics.com)

E-mail: [info@kramerel.com](mailto:info@kramerel.com)



#### SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing



P/N: 2900-300229



Rev: 3