KRAMER

USER MANUAL
MODEL:

FC-7P
Ethernet Gateway − GPIO/Relay

Contents

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!

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/FC-7P to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

Achieving 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 **FC-7P** away from moisture, excessive sunlight and dust.

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 GPI\O 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 **FC-7P Ethernet Gateway − GPIO/Relay**. **FC-7P** is a compact GPIO/relay multi-function control gateway with PoE, capable of plug and play deployment over a customer Ethernet LAN for remote GPI/O and relay control of customer devices. Multiple control clients can be IP-connected to the **FC-7P** control gateway for concurrent control of devices such as lights, shades and screens.

The **FC-7P** features:

- Dual–Function I/O Ports − Remote IP–Based control of devices connected to the control gateway dual-function I/O ports, with selectable port configuration to bidirectional GPIO or relay control.

- Multiple IP Connected Clients − Remotely connects over customer Ethernet network, concurrently controls any devices connected to control gateway universal I/O ports.

- Easy & Reliable Installation:

  - Plug–and–Play IP Installation with dynamic (DHCP) address resolution and auto device discovery over existing LAN.

  - Compact, designed for piggy-back installation, such as behind a TV or display, with the ability to draw power from device USB port and Ethernet connectivity.

- Remote Management – Built-in web UI for remote browser-based management and support, by multiple IP-clients over existing LAN. Easy firmware upgrades, either remotely via existing LAN, or locally via device USB port.

- Power Options − USB, Power over Ethernet, optional PSU.

- PoE Support – According to IEEE 802.3af standard

- Size − DigiTOOLS™ − Mount 3 units side-by-side in a 1U rack space with the optional RK-3T rack adapter.
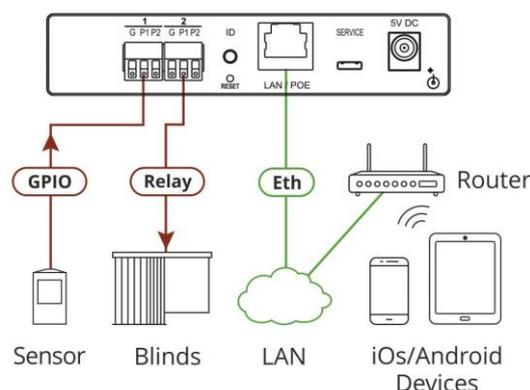

Figure 1: FC-7P Controlling Devices Remotely Using K-Touch 3.0 over a LAN

For example, using Kramer **K-Touch** control software you can design advanced room-control and automation systems that can be operated from iOS or Android touch devices. **K-Touch** can be used to perform device discovery over the network as the **FC-7P** is set to be a DHCP client by default.

You can use the Kramer **LAN Configurator** software to discover devices that are attached to the network, including the **FC-7P**.

Typical Applications

FC-7P is ideal for the following typical applications:

- Remote IP control of GPIO and relay-controllable devices by any control software app
- K-Touch multi-clients IP room control
- LAN-based expansion of K-Config control system

Defining FC-7P Ethernet Gateway − GPIO/Relay

This section defines the **FC-7P**.
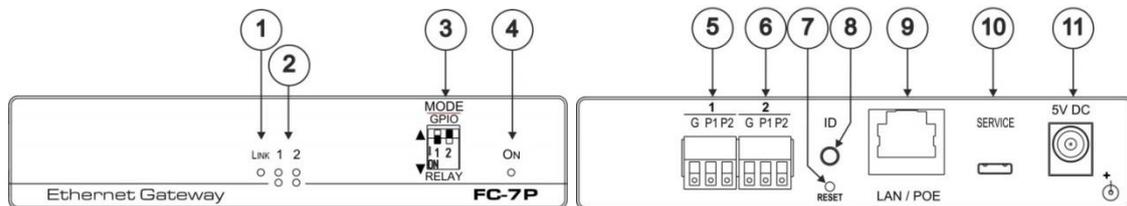
Figure 2: FC-7P Ethernet Gateway − GPIO/Relay

Feature	Function	Feature
1	LINK LED	Shows the Ethernet link is active
2	Activity LEDs Ports 1 and 2, white (upper) and blue (lower)	Indicate the transmission (output) status of port 1 and port 2: When the port is set as GPIO Digital Out, the white LED indicates that IO-P1 is active and the blue LED indicates that IO-P2 is active. When the port is set as RELAY, the white LED indicates that Relay-P1 is active and the blue LED indicates that Relay-P2 is active.
3	MODE DIP-switches (Port 1 and Port 2)	Switch up (off) for GPIO, switch down (on) for relay The default setting is port 1 GPIO (up) and port 2 relay (down)
4	ON LED	Lights green when the unit is on
5	Port 1 I/O 3-pin Terminal Block	Port 1 terminal block port connects to two GPIO ports or two relays
6	Port 2 I/O 3-pin Terminal Block	Port 2 terminal block port connects to two GPIO ports or two relays
7	RESET Button	Press and hold while cycling the device power to reset to factory default parameters
8	ID	Press to broadcast ID message for auto-discovery of the device
9	LAN/POE RJ-45 Connector	Connects to a PoE source (Power over Ethernet) for powering and an IP client or other controller, either directly or via a LAN
10	SERVICE Mini USB Connector	Connects to a USB power source for powering and to a PC for a local firmware upgrade
11	5V DC Connector	For extra power resiliency, connect to the optional 5V DC power supply, center pin positive. Not needed when the device is supplied power by PoE or a USB power source

FC-7P Function Table

Port IO Function	Terminal Block Connections			IO Port Default	TCP Default Port [P1/P2]	Transmission (Output) Activity LEDs P1-white P2-blue	Comment
	G	P1	P2				
GPIO	Ground	IO_1	IO_2	Digital In x 2	5000	ON when GPIO Digital Out ports are active	GPIO Digital out via Web
Relay	Common	NO_1	NO_2	Normally Open x 2	5000	ON when Relay ports are active	

Key:

- P1 / P2 – Port 1 / Port 2

- IO_1 / IO_2 – GPIO Port 1 / GPIO Port 2

- NO_1/NO_2 – Normally open Port 1 / Normally open Port 2

Performing Initial Configuration

This chapter provides an overview of the initial configuration and basic operation of the **FC-7P** and comprises:

- Configuring the **FC-7P** (see Configuring FC-7P Ethernet Gateway – GPIO/Relay on page 6)

- Configuring an Ethernet connection on the PC (see Setting Up an Ethernet Connection on the PC on page 7)
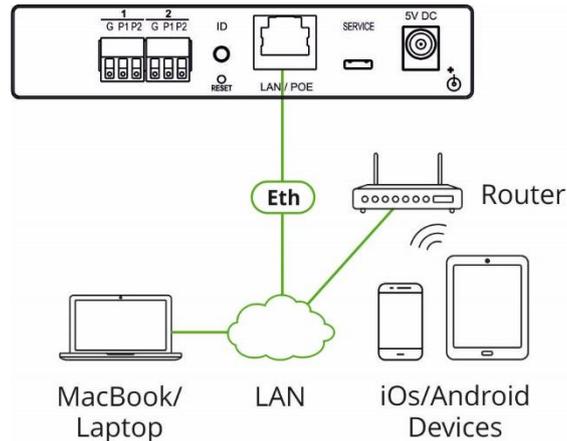
Figure 3: Connecting the FC-7P for Initial Configuration

Configuring FC-7P Ethernet Gateway – GPIO/Relay

The **FC-7P** is shipped from the factory with DHCP enabled (off by default) and a random IP address. To connect the **FC-7P** on first installation, you must identify the IP address that was automatically assigned to the **FC-7P**. To discover the IP address of **FC-7P**, use **K-LAN Configurator,** available for download from our website at www.kramerav.com.

To browse the FC-7P Web UI on taking the device out of the box:

Use the default host name: **FC-7-xxxx**, where xxxx are the last four digits of the serial number of the device**.**

To configure the FC-7P:

1. Connect the Ethernet port on the rear panel of the **FC-7P** to a PC, either directly or via a LAN, (see Connecting via Ethernet on page 10).

2. Using a Web browser and the relevant IP address or host name (see Default Parameters on page 27), browse the General Info home page (see Figure 10).

3. Click **Device Settings** to browse to the Device Settings page, (see Figure 11).

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 **Communication** to browse to the Communication page, (see Figure 12).

ⓘ If you have changed the IP address from the default setting, you must reload the General Info home page again using the new IP address.

7. Enter the IP address, mask and gateway for static IP addressing and click **Set**. We recommend that you set a meaningful host name.

8. Click **GPIO Port Settings** to browse to the GPIO Port Settings page, (see Setting GPIO Port Parameters on page 17). Here you can configure digital in, digital out and analog in port parameters.

9. Set the trigger type, voltage levels and status of each port.

10. Click **Save Changes**.

11. Click **Relay Port Settings** to browse to the Relay Port Settings page, (see Setting Relay Port Status on page 20). Here you can set the relays on or off.

12. If required, click **Security** (see Activating Security on page 21) 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. (The default user name is **Admin** and the password is **Admin**).

Setting Up an Ethernet Connection on the PC

If the control application can directly connect to the Ethernet driver, select the host IP address and port number according to your **FC-7P** configuration, as illustrated in Figure 4.
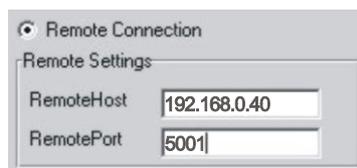
Figure 4: Configuring a Remote Connection

To switch ports on the FC-7P:

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.

Mounting FC-7P

This section provides instructions for rack mounting **FC-7P**. Before installing in a rack, verify that the environment is within the recommended range:

ⓘ
- Operation 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.

ⓘ
- **FC-7P** must be placed upright in the correct horizontal position.

⚠ **Caution:**
- Always mount **FC-7P** in a rack before connecting any cables or power.

⚠ **Warning:**
- Ensure that the environment (e.g., maximum ambient temperature & air flow) is compatible for the device.
- Avoid uneven mechanical loading.
- Appropriate consideration of equipment nameplate ratings should be used for avoiding overloading of the circuits.
- Reliable earthing of rack-mounted equipment should be maintained.
- Maximum mounting height for the device is 2 meters.

To mount the FC-7P on a rack

Mount the unit in a rack using the recommended rack adapter
(see www.kramerav.com/product/FC-7P)

To mount the FC-7P on a table or shelf

- Attach the rubber feet and place the unit on a flat surface.
- Fasten a bracket on each side of the unit and attach it to a flat surface.
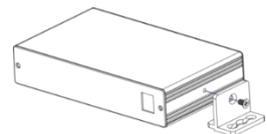
ⓘ
For more information go to www.kramerav.com/downloads/FC-7P

Connecting FC-7P

(i) Always switch off the power to each device before connecting it to your **FC-7P**. After connecting your **FC-7P**, connect its power and then switch on the power to each device.
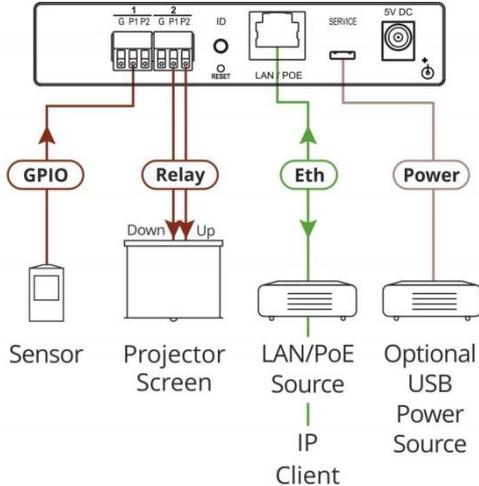

Figure 5: Connecting the FC-7P Ethernet Gateway − GPIO/Relay

To connect the FC-7P as illustrated in the example in Figure 5:

1. Connect the device to a LAN or PC via the RJ-45 Ethernet connector.

2. Set DIP-switch 1 up to select GPIO.

   Connect an input or output device, (for example, a sensor) to terminal block 1, pin P1 (or P2), according to the connections shown in table below.

3. Set DIP-switch 2 down to select relay.

   Connect a relay-controlled device, (for example, a projection screen) to terminal block 2, according to the table below.

Port IO Function	Terminal Block Connections		
	G	P1	P2
GPIO	Ground	IO_1	IO_2
Relay	Common	NO_1	NO_2

4. If the **FC-7P** does not receive power from a PoE provider or a USB power connection, connect the device to the power supply and connect the power adapter to the mains electricity (not shown in Figure 5).

(i) Changing the DIP-switches resets the ports to their default state: GPIO resets to its low logic state and the relay resets to its open state.

Connecting via Ethernet

You can connect to the **FC-7P** via Ethernet using either of the following methods:

- Directly to the PC using a crossover cable (see Connecting the Ethernet Port via a Network Hub or Switch on page 12)

- Via a network hub, switch, or router, using a straight-through cable (see Connecting the Ethernet Port via a Network Hub or Switch on page 12)

ⓘ 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.

Connecting the Ethernet Port Directly to a PC

You can connect the Ethernet port of the **FC-7P** 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 **FC-7P** with the factory configured default IP address.

After connecting 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.
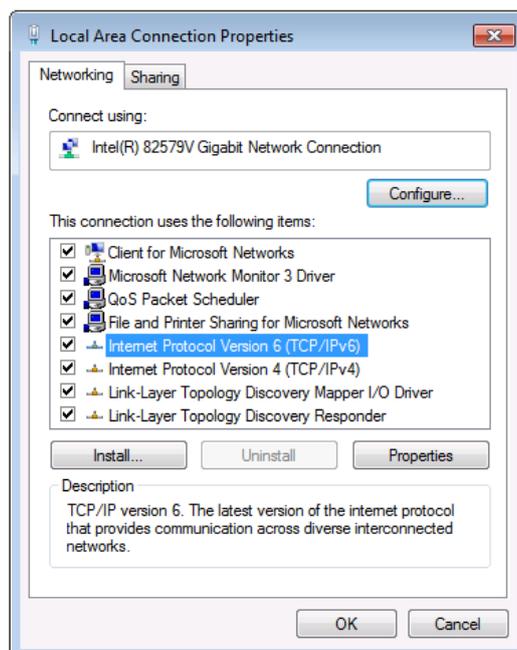
Figure 6: Local Area Connection Properties Window

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.
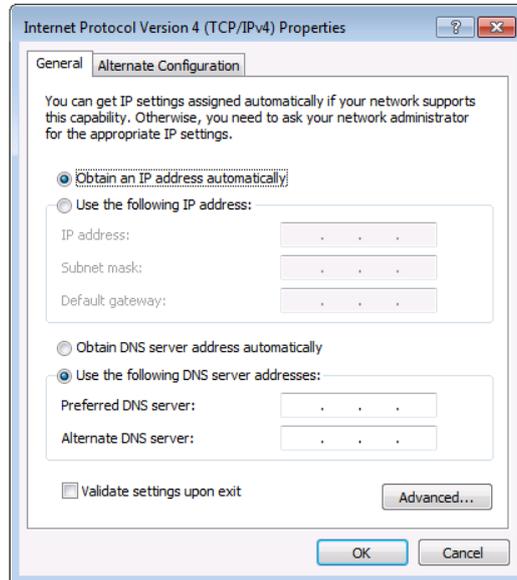
Figure 7: Internet Protocol Version 4 Properties Window
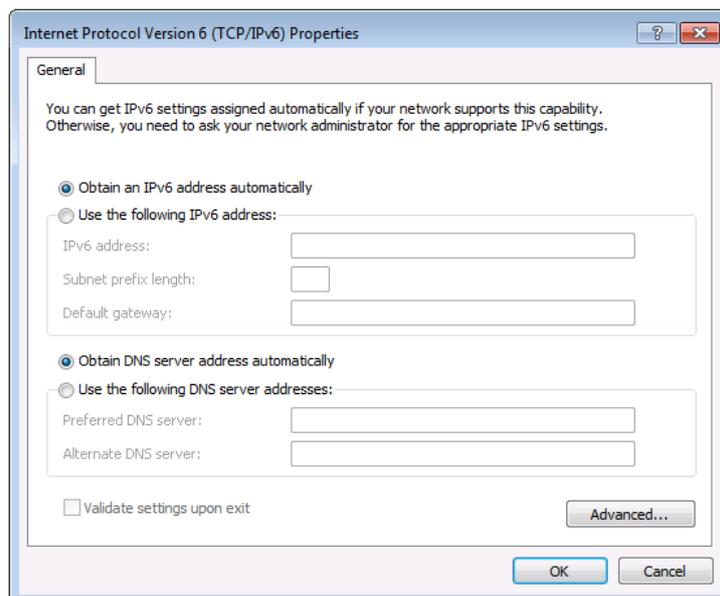
Figure 8: Internet Protocol Version 6 Properties Window

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.
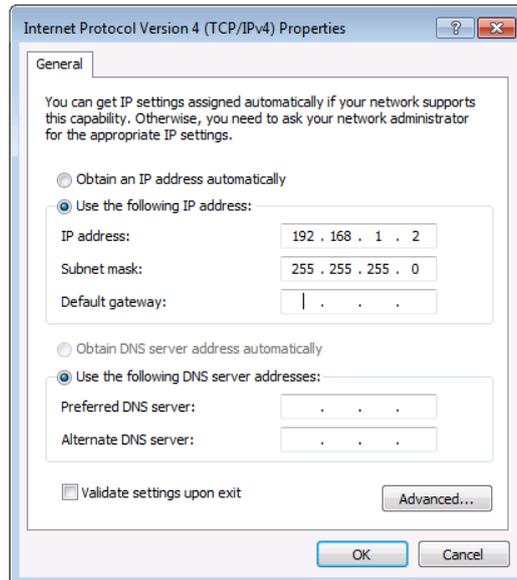
Figure 9: Internet Protocol Properties Window

7. Click **OK**.

8. Click **Close**.

Connecting the Ethernet Port via a Network Hub or Switch

You can connect the Ethernet port of the **FC-7P** to the Ethernet port on a network hub or switch using a straight-through cable with RJ-45 connectors.

# Connecting the GPIO Ports on the FC-7P to a Device

To connect the GPIO port on the FC-7P to a device:

- Connect the G pin on the GPIO port to the ground connection on the device

- Connect the S pin on the GPIO port to the signal/positive connection on the device

- Set the DIP-switch for the port UP (Off)

Connecting the Relays on the FC-7P to a Device

To connect the relay port on the FC-7P to a device:

- Connect the C pin on the relay port to the ground connection on the device

- Connect the NO pin on the relay port to the signal/positive connection on the device

- Set the DIP-switch for the port DOWN (On) for Relay

Using Embedded Web Pages

The embedded Web UI can be used to remotely operate the **FC-7P** using a Web browser and an Ethernet connection.

Before attempting to connect:

1. Perform the initial configuration in Configuring FC-7P Ethernet Gateway − GPIO/Relay on page 6 and connecting via Ethernet in Connecting via Ethernet on page 10

2. Ensure that your browser is supported (see Technical Specifications on page 26)

Browsing FC-7P Web Pages

To browse the Web UI:

1. Open your Internet browser. Type the IP address of the device (see Configuring FC-7P Ethernet Gateway − GPIO/Relay on page 6) in the Address bar of your browser.

```
http://192.168.1.39
```

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 UI version
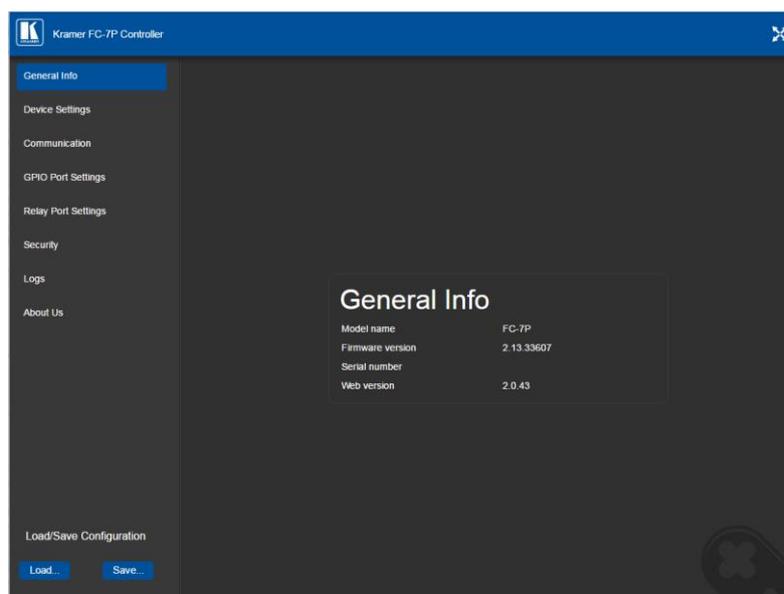
Figure 10: General Info Page

Loading and Saving Configurations

Loading and saving configurations is used for duplicating multiple device definitions for easy system configuration. The configurations are loaded and saved to a local PC. Load and save is performed using the buttons at the bottom left-hand side of the screen for all pages displayed.

To load a configuration:

1. Click **Load**.

   The Explorer window opens.

2. Browse to the required file.

3. Select the required file and click **Open**.

   The device is configured according to the saved preset.

To save the current configuration:

1. Configure the device as required.

2. Click **Save**.

   The Save File window opens.

3. Browse to the required location to which to save the file.

4. Enter the required name for the saved preset.

5. Click **OK**.

   The current configuration is saved.

When using Chrome, the file is automatically saved in the Downloads folder.

The following parameters are saved to the configuration file:

UI Page	Parameter
Device Settings (Figure 11)	Model Name Time Zone Daylight Savings Time mode Use Time Server mode Time Server Address Sync Every Day time
Communication (Figure 12)	UDP Port TCP Port
GPIO Port Settings (Figure 13)	GPIO Port Trigger Type Pull-up Resistor Threshold VDC Range Min Threshold VDC Range Max Maximum Reported Steps

Setting Device Name and Time Functions

The Device Settings page ([Figure 11](#)) allows you to view the model name and time server status. You can also modify the following fields:

- Device name

- Device time, date, and time zone

- Use a timeserver to set the time and date automatically using a (if the device is connected to the Internet), including the Time Zone and daylight savings time

Figure 11: Device Settings Page

The **FC-7P** 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 11](#).

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-7P** should synchronize with the Time Server.

5. Click **Save Changes**.

Setting Communication Parameters

The communication page allows you to:

- Turn DHCP for the device on and off

- Edit the IP settings for static IP addressing

The default IP address setting for the device is DHCP.
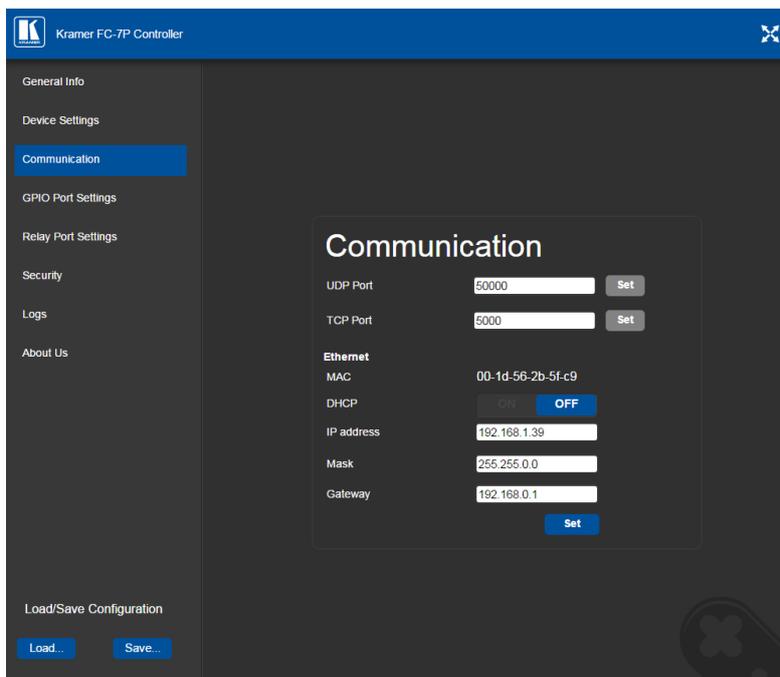
Figure 12: Communication Page

After modifying any of the IP settings, click **Set** to save the changes.

Setting GPIO Port Parameters

GPIO ports are used to connect and control hardware devices to the **FC-7P** such as sensors, switches and LED indicators that input and output digital signals and input analog signals.
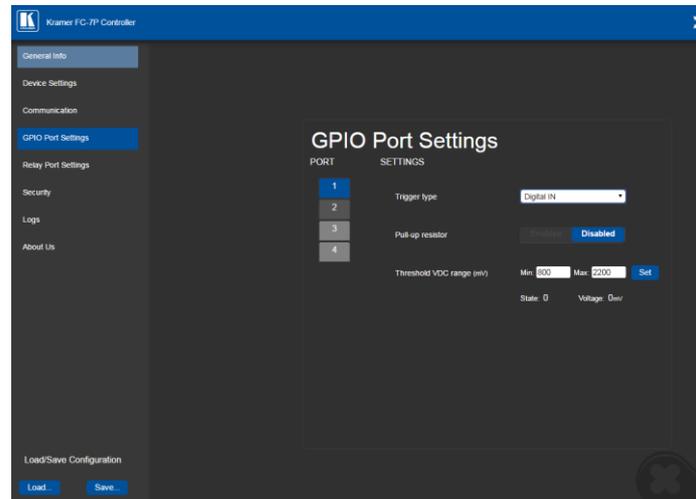
Figure 13: GPIO Port Settings Page

The GPIO Port Setting page allows you to configure the following for each GPIO port:

- Trigger type—digital input, digital output, or analog input

- Enable and disable the pull-up resistor for the digital input and output

- Set the threshold trigger voltage range for the digital input

- Set the current status for the digital output signal to high or low

- Set the maximum number of reported steps for the analog input

- Read—Press to read the state of the port (displayed according to the page)

- State—Displays the digital state of the port, either 1 (high) or 0 (low) (displayed according to the page)

GPIO sub-ports are displayed according to their DIP-switch settings.

(i) The default parameter settings change depending on which trigger type is selected.

(i) When DIP-switches 1 and 2 are set down to Relay, GPIO ports 1 through 4 are grayed out and the following GPIO port settings screen appears:
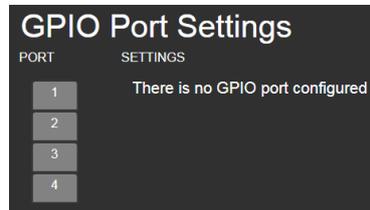
Setting Digital In Trigger Parameters
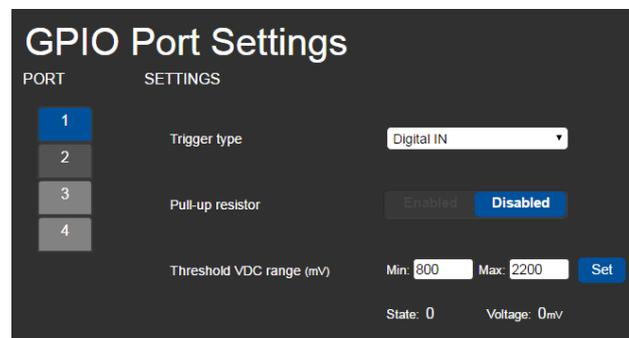
Figure 14: GPIO Port Settings Page Digital IN

Set the trigger type to Digital In (default). With this selection, the digital input trigger mode reads the digital input of an external sensor device that is connected to the GPIO port. It detects high (upon passing Max. threshold from Low state, default 2.2V) or low (upon passing Min threshold from High state, default 0.8V) port states according to the user defined voltage threshold levels:

- Pull-up resistor enabled (default)

  Detects an open circuit as High, or a short to ground as Low. This is suitable for example, for a pushbutton switch (connecting one terminal of the switch to ground, and the other to the input) or for an alarm closing a circuit that activates a series of actions.

  When the pull-up is enabled, the port state is high and to be triggered it must be pulled low by the externally connected sensor.

- Pull-up resistor disabled

  Suitable, for example, for a high-temperature alarm that exceeds the maximum voltage threshold.

  When disabled, the port state is low and to be triggered it must be pulled high by the externally connected sensor.

Setting Digital Out Trigger Parameters
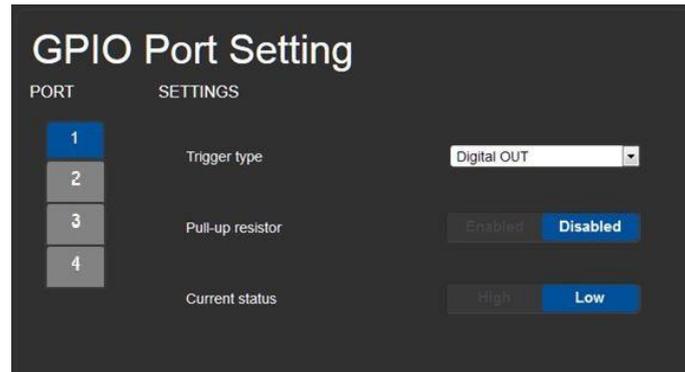
Figure 15: GPIO Port Settings Page Digital OUT

Set the trigger type to Digital Out. With this selection, the external device, (for example, an electric blind) is controlled by the **FC-7P**.

When selecting the Digital Out trigger type, the warning popup shown in Figure 16 is displayed.
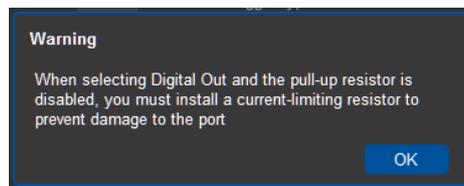
Figure 16: Digital Out Selection Warning Popup

The digital output mode function is defined by the pull-up resistor setup:

- Pullup resistor enabled:

  The port is used for controlling external devices such as room or light switches. The external source device determines the voltage output; the maximum voltage is 30V DC and the maximum current is 100mA.

ⓘ   Take care that the current in this configuration does not exceed 100mA!

When enabled, the port state is high by default. For the state to be low, you must click Low from the Current Status.

- Pullup resistor disabled (default):

  The port can be used for controlling devices that accept a TTL signal such as for powering LEDs. The voltage output is TTL positive logic: open: ~ 3.5V; closed: ~ 0.3V.

When disabled, the port state is low by default and to set it high, you must click High from the Current Status.

Setting Analog In Trigger Parameters
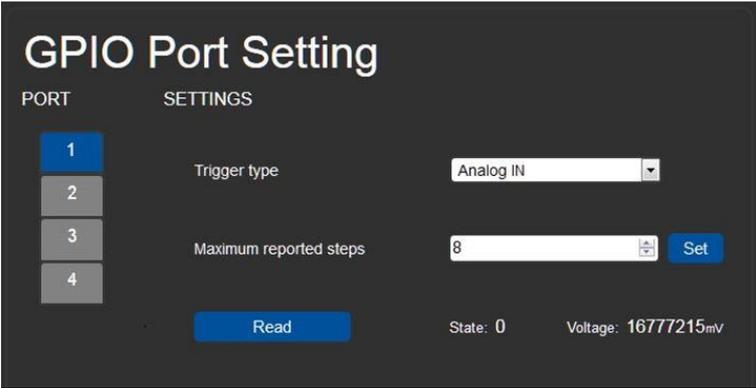
Figure 17: GPIO Port Settings Page Analog IN

Set the trigger type to Analog In. With this selection, the port is triggered by an analog external device, such as, a volume control device. The trigger is activated once when the detected voltage is within 0 to 30V DC voltage range.

You can select the number of steps the analog input signal will be divided into, starting with step 1 and with a maximum of 100 (default 8). The voltage of each step is dependent on the number of steps selected:

Individual step voltage = 30V / number of steps

When selecting the Analog In trigger type, the Pullup resistor and Threshold settings are disabled.

Setting Relay Port Status

The Relay Port Settings page allows you to turn the relays on and off to control relay-driven devices such as shades, projection screens and lighting systems.
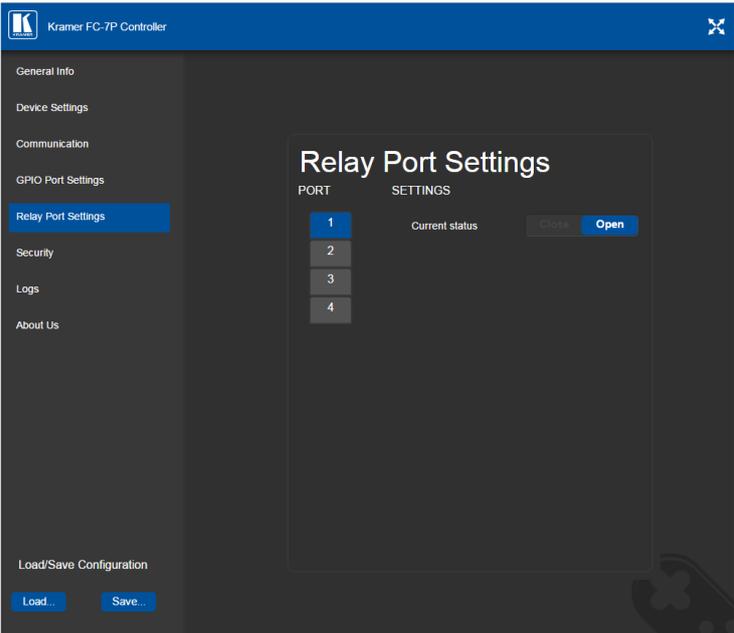
Figure 18: Relay Port Settings Page

The relay ports have the following characteristics:

- Rated at 30V DC and 1A

- Default state of normally open

- A non-latching relay function, that is, the contact is left open when unpowered or on power up state. This means that if a relay is closed and power is lost, the relay returns to its default state. To return it to its pre-power loss state, the setting must be changed using either the Web UI or a P3000 command

To close a relay, (for example, relay 2):

1. On the Relay Setting page, click Port button 2 to select the second relay.

   The current relay status is shown to the right of the button.

2. Click Close.

   The relay closes, the button changes color, and the Relay 2 LED on the front panel lights green.

When DIP-switches 1 and 2 are set up to GPIO, Relay ports 1 through 4 are grayed out and the following Relay port settings screen appears:
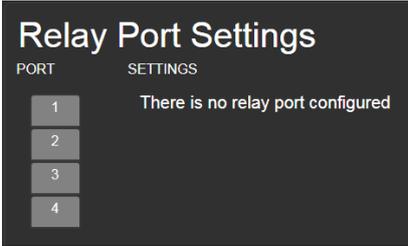
Activating Security

The Security page allows you to turn logon authentication on or off.
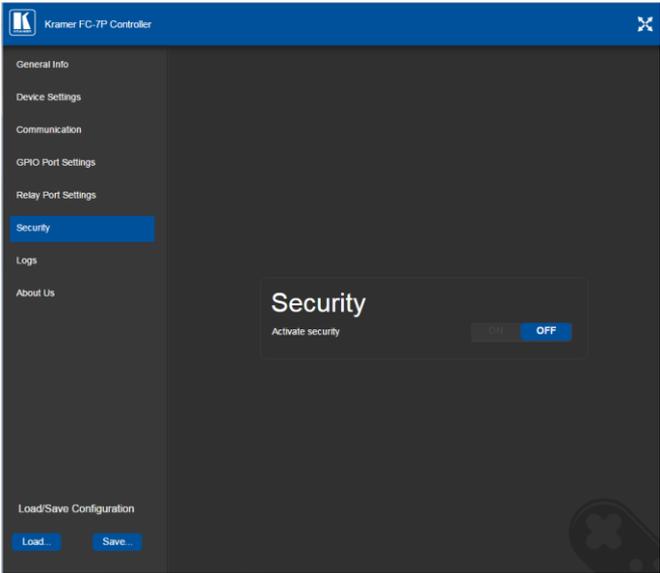
Figure 19: Security Page

When security is on, access to the Web UI is granted only on submission of a valid user and password. The default user ID is **Admin** and the password is **Admin**.

To activate Web UI security:

1. On the Security page, click ON.

   The confirmation popup is displayed as shown in Figure 20.
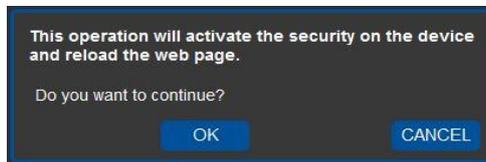
Figure 20: Security Confirmation Popup

2. Click **OK**.

   The Authentication Required popup is displayed as shown in Figure 21.
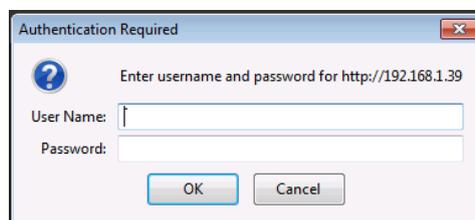
Figure 21: Authentication Required Popup

3. Enter the default username and password.

4. Click **OK**.

5. Wait until the Web UI has reloaded. Click the Security page button.

   The page show in Figure 22 is displayed.
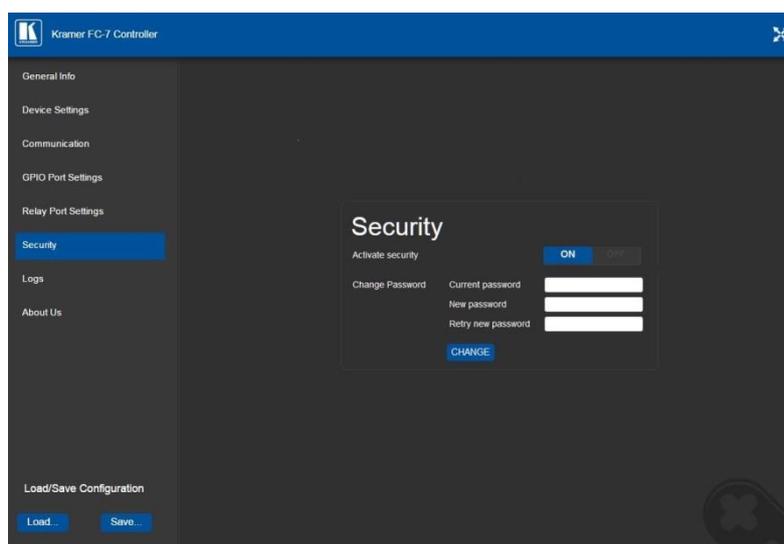
Figure 22: Security Activated Page

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

Using the Logs Page

The Logs page allows you to:

- View current logs

- Configure the logs

- Filter the logs
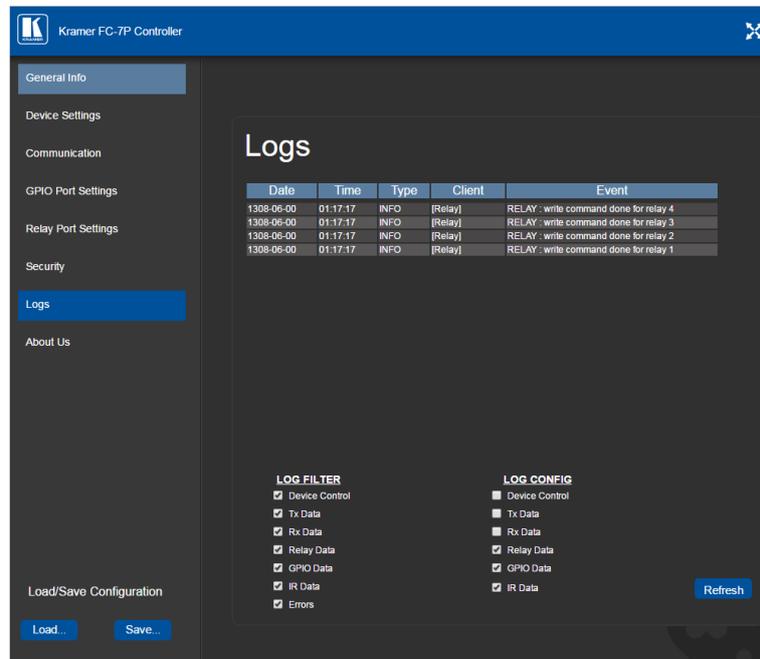
Figure 23: Logs Page

The display may not update automatically. Click Refresh to update the display.

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

Kramer Information

The About Us page displays the Web UI version and the Kramer company details.
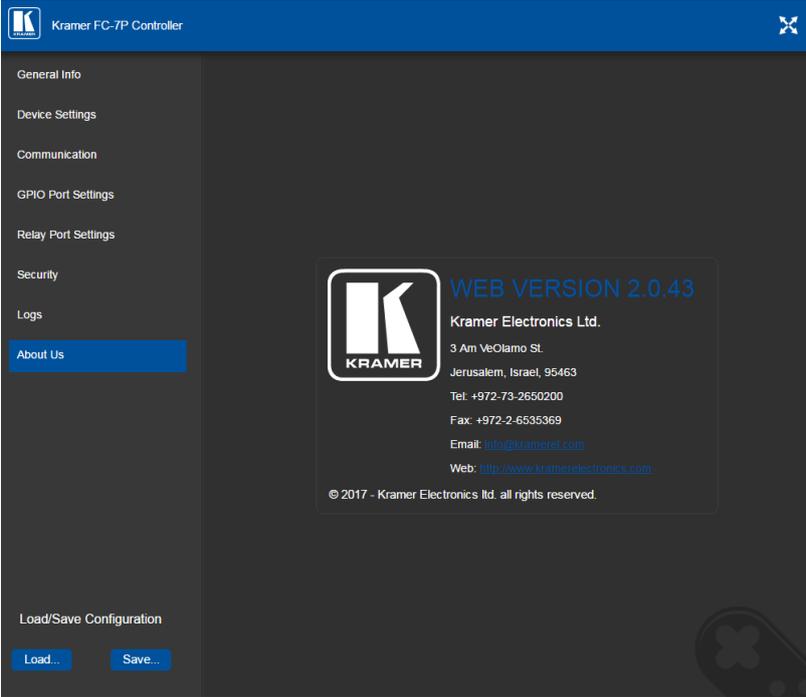
Figure 24: About Us Page

Using FC-7P Operations

This section explains how to reset the device and upgrade device firmware.

Resetting to 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.

Upgrading Firmware

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

Technical Specifications

Ports	4 GPIO	On 2-pin terminal blocks
	2 relays	On 3-pin terminal blocks
	1 LAN	On an RJ-45 connector
	1 mini USB connector	For programming
Power	Power consumption	5V DC, 350mA
Cooling	Convection ventilation	
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	Vibration	ISTA 1A in carton (International Safe Transit Association)
	Safety	CE
	Environmental	RoHs, WEEE
General	Enclosure type	Aluminum
	Net dimensions	6.22cm x 5.18cm x 2.44cm (2.45" x 2.0" x 1.0") W, D, H.
	Net weight	0.18kg (0.4lbs) approx.
	Shipping dimensions	15.7cm x 12cm x 8.7cm (6.2" x 4.7" x 3.4") W, D, H.
	Shipping weight	0.82kg (1.76lbs) approx.
Accessories	Included	3ft USB cable, bracket set
	Optional	PS-504 5V DC power adapter, RK-3T 19" rack adapter, Cables – see www.kramerav.com/product/FC-7P
Specifications are subject to change without notice at www.kramerav.com		

Default Parameters

ⓘ The **FC-7P** is dispatched from the factory with DHCP enabled and a random IP address. After performing a factory reset, the DHCP and the IP address are set to the values shown below.

Ethernet	
DHCP:	Off
IP Address:	192.168.1.39
Host Name:	FC-7-xxxx where xxxx are the last four digits of the serial number of the device
Subnet Mask:	255.255.0.0
Gateway:	192.168.0.1
Maximum Simultaneous Connections:	40
TCP Port 1:	5001
TCP Port 2:	5002
UDP Port:	50000

Default Logon Authentication

Web UI Access	
User name:	Admin
Password:	Admin

Kramer Protocol 3000

The **FC-7P** can be operated using the Kramer Protocol 3000 serial commands. The command framing varies according to how you interface with the **FC-7P**.

- Terminal communication software, such as Hercules:
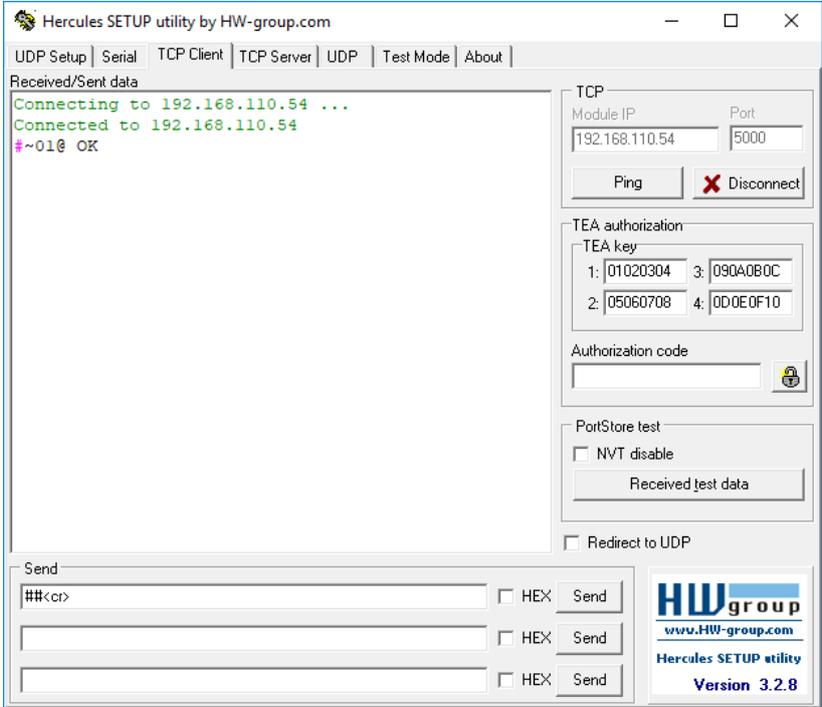
The framing of the command varies according to the terminal communication software.

- K-Touch Builder (Kramer software):
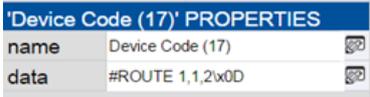
- K-Config (Kramer configuration software):
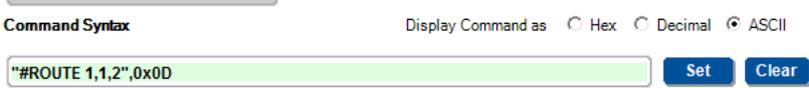
ⓘ All the examples provided in this section are based on using the K-Config software.

You can enter commands directly using terminal communication software (e.g., Hercules) by connecting a PC to the serial or Ethernet port on the **FC-7P**. To enter CR press the Enter key (LF is also sent but is ignored by the command parser).

Commands sent from various non-Kramer controllers (e.g., Crestron) may require special coding for some characters (such as, /X##). For more information, refer to your controller's documentation.

Kramer Protocol 3000 – Syntax

Host Message Format

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

Simple Command

Command string with only one command without addressing:

Start	Body	Delimiter
#	**Command** SP *Parameter_1,Parameter_2,…*	CR

Command String

Formal syntax with commands concatenation and addressing:

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

Device Message Format

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

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)

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.

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

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

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.

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.

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.

Maximum String Length

64 characters

Kramer Protocol 3000 – Command List

Command	Description
#	Protocol handshaking
BUILD-DATE	Read device build date
COM-ROUTE	Set/get tunneling port routing
COM-ROUTE-ADD	Add communication route tunnel connection
COM-ROUTE-REMOVE	Remove communication route tunnel connection
DEL	Deletes a file
DIR	List files
ETH-PORT	Sets protocol port
ETH-TUNNEL	Get parameters for open tunnels
FACTORY	Restart the machine with the default
FORMAT	Format the file system
FS-FREE	Print free file space
GET	Get file content
GPIO-CFG	Set/get HW GPIO configuration
GPIO-STATE	Set/get HW GPIO state
GPIO-STEP	Set/get HW GPIO step
GPIO-THR	Set/get HW GPIO threshold voltage
GPIO-VOLT	Get HW GPIO voltage level
HELP	List of commands
LOGIN	Set/get protocol permission
LOGOUT	Demotes the terminal security level to minimum
MACH-NUM	Set device ID
MODEL	Read device model
NAME	Set/get device (DNS) name
NAME-RST	Reset device name to default
NET-DHCP	Set/get DHCP mode
NET-GATE	Set/get gateway IP
NET-IP	Set/get device IP address
NET-MAC	Get the MAC address
NET-MASK	Set/get the device subnet mask
PASS	Set/get the password for login level
PORT-LOCK	Set/get the port lock state
PORT-TYPE	Set/get the port type
PROT-VER	Get protocol version
RELAY-STATE	Set/get relay state
RESET	Reset device
SECUR	Set/get current security state
SN	Get device serial number

Command	Description
TIME	Set/get the time
TIME-LOC	Set/get local time offset from UTC/GMT
TIME-SRV	Set/get time synchronization from server
VERSION	Get firmware version number

Kramer Protocol 3000 – Detailed Commands

This section lists the detailed commands applicable to the **FC-7P**.

#

Functions		Permission	Transparency
Set:	#	End User	Public
Get:	**-**	-	-
Description		**Syntax**	
Set:	Protocol handshaking	#CR	
Get:	-	-	
Response			
~nn@SPOKCR LF			
Parameters			
Response Triggers			
Notes			
Validates the Protocol 3000 connection and gets the machine number Step-in master products use this command to identify the availability of a device			
K-Config Example			
"#",0x0D			

BUILD-DATE

Functions		Permission	Transparency
Set:	-	-	-
Get:	`BUILD-DATE?`	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get device build date	`#BUILD-DATE?`[CR]	
Response			
`~`[nn]`@BUILD-DATE`[SP]*date*[SP]*time*[CR 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			
K-Config Example			
`"#BUILD-DATE?",0x0D`			

COM-ROUTE

Functions		Permission	Transparency
Set:	–	–	–
Get:	`COM-ROUTE?`	End User	Internal
Description		**Syntax**	
Set:	Set tunneling port routing	`#COM-ROUTE`[SP] *COM_Num,portType,ETHPort,ETH_rep_en,TCP_keep_alive_timing*[CR]	
Get:	Get tunneling port routing	`#COM-ROUTE?`[SP]*COM_Num*[CR]	
Response			
`~`[nn]`@COM-ROUTE`[SP]*COM_Num,portType,ETHPort,ETH_rep_en,TCP_keep_alive_timing*[CR LF]			
Parameters			
COM_Num – machine dependent *portType* – `1` (UDP), `2` (TCP) *ETHPort* – TCP/UDP port number *ETH_rep_en* – `1` (COM port sends replies to new clients), `0` (COM port does not send replies to new clients) *TCP_keep_alive_timing* – `0-3600` seconds – every x seconds the device sends an empty string to TCP client (`"/0"`)			
Response Triggers			
Notes			
This command sets tunneling port routing. Every com port can send or receive data from the ETH port. All com ports can be configured to the same ETH port.			
K-Config Example			
Set COM1 as RS-232, port 1, Eth port 1, send replies, keep alive 30 seconds `"#COM-ROUTE 1,1,1,1,30",0x0D`			

COM-ROUTE-ADD

Functions		Permission	Transparency
Set:	COM-ROUTE-ADD	Administrator	Internal
Get:	-	-	-
Description		**Syntax**	
Set:	Add a communication route tunnel connection	#COM-ROUTE-ADD␣SP␣ *ComNum,PortType,EthPort,EthRepEn,Timeout*␣CR	
Get:	-	-	

Response

~␣nn␣@COM-ROUTE-ADD␣SP␣*ComNum,PortType,EthPort,EthRepEn,Timeout*␣CR LF

Parameters

COMNum – machine dependent

portType – 1 (UDP), 2 (TCP)

ETHPort – TCP/UDP port number

ETHRepEn – 1 (COM port sends replies to new clients), 0 (COM port does not send replies to new clients)

Timeout – Keep alive timeout in seconds (1 to 3600)

Response Triggers

Notes

K-Config Example

Add COM1 port as TCP, port 1, Eth port 1, send replies, keep alive 30 seconds
"#COM-ROUTE-ADD 1,1,1,1,30",0x0D

COM-ROUTE-REMOVE

Functions		Permission	Transparency
Set:	COM-ROUTE-REMOVE	Administrator	Internal
Get:	-	-	-
Description		**Syntax**	
Set:	Remove a communication route tunnel connection	#COM-ROUTE-REMOVE␣SP␣*ComNum*␣CR	
Get:	-	-	

Response

~␣nn␣@COM-ROUTE-REMOVE␣SP␣*ComNum*␣CR LF

Parameters

ComNum – machine dependent

Response Triggers

Notes

K-Config Example

Remove comm port 1.
"#COM-ROUTE-REMOVE 1",0x0D

DEL

Functions		Permission	Transparency
Set:	`DEL`	Administrator	Public
Get:	**-**	-	-
Description		**Syntax**	
Set:	Delete file	`#DEL`SP`file_name`CR	
Get:			
Response			
~nn@`DEL`SP`file_name`CR			
Parameters			
`file_name` – name of file to delete (file names are case-sensitive)			
Response Triggers			
K-Config Example			
Delete a file named "test". `"DEL test",0x0D`			

DIR

Functions		Permission	Transparency
Set:	`DIR`	Administrator	Public
Get:	**-**	-	-
Description		**Syntax**	
Set:	List files in device	`#DIR`CR	
Get:	-	-	
Response			
Multi-line: ~nn@`DIR`CR LF `file_name`TAB `file_size`SP`bytes,`SP`ID:`SP`file_id`CR LF TAB`free_size`SP`bytes.`CR LF			
Parameters			
`file_name` – name of file `file_size` – file size in bytes. A file can take more space on device memory `file_id` – internal ID for file in file system `free_size` – free space in bytes in device file system			
Response Triggers			
K-Config Example			
`"DIR",0x0D`			

ETH-PORT

Functions		Permission	Transparency
Set:	ETH-PORT	Administrator	Public
Get:	ETH-PORT?	End User	Public
Description		**Syntax**	
Set:	Set Ethernet port protocol	#ETH-PORT`SP`*portType*,*ETHPort*`CR`	
Get:	Get Ethernet port protocol	#ETH-PORT?`SP`*portType*`CR`	
Response			
~`nn`@ETH-PORT`SP`*portType*,*ETHPort*`CR LF`			
Parameters			
portType – 1 (UDP), 2 (TCP) *ETHPort* – TCP/UDP port number			
Response Triggers			
K-Config Example			
Set ETH port 1 to UDP. "ETH-PORT 2,1",0x0D			

ETH-TUNNEL

Functions		Permission	Transparency
Set:	-	-	-
Get:	ETH-TUNNEL?	Administrator	Internal
Description		**Syntax**	
Set:			
Get:	Get parameters for an open tunnel	#ETH-TUNNEL?`SP`*TunnelId*`CR`	
Response			
~`nn`@ETH-TUNNEL`SP` *TunnelId,ComNum,PortType,EthPort,EthIp,RemotPort,EthRepEn,Wired*`CR LF`			
Parameters			
TunnelId – tunnel ID number: 1-64 (depends on number of tunnel connections), * (all tunnel connections) *ComNum* – UART number *portType* – 1 (UDP), 2 (TCP) *ETHPort* – TCP/UDP port number *EthIp* – client IP address *RemotPort* – remote port number *EthRepEn* – 1 (COM port sends replies to new clients), 0 (COM port does not send replies to new clients) *Wired* – 1 (wired connection), 0 (not wired connection)			
Response Triggers			
Notes			
The response displays each tunnel in a separate line.			
K-Config Example			
"ETH-TUNNEL? 1",0x0D			

FACTORY

Functions		Permission	Transparency
Set:	FACTORY	End User	Public
Get:	-	-	-
Description		**Syntax**	
Set:	Reset device to factory default configuration	#FACTORY CR	
Get:	-	-	
Response			
~nn@FACTORY SP OK CR LF			
Parameters			
Response Triggers			
Notes			
This command deletes all user data from the device. The deletion can take some time. Your device may require powering off and powering on for the changes to take effect.			
K-Config Example			
"#FACTORY",0x0D			

FORMAT

Functions		Permission	Transparency
Set:	FORMAT	Administrator	Public
Get:	–	-	-
Description		**Syntax**	
Set:	Format file system	#FORMAT CR	
Get:	-	-	
Response			
~nn@FORMAT SP OK CR LF			
Parameters			
Response Triggers			
Notes			
Response could take several seconds until formatting completes			
K-Config Example			
"#FORMAT",0x0D			

FS-FREE

Functions		Permission	Transparency
Set:	–	-	-
Get:	FS-FREE?	Administrator	Public

Description		Syntax	
Set:	-	-	
Get:	Get file system free space	#FS-FREE?`CR`	

Response

~`nn`@FS_FREE`SP`*free_size*`CR LF`

Parameters

free_size – free size in device file system in bytes

Response Triggers

K-Config Example

"#FS-FREE?",0x0D

GET

Functions		Permission	Transparency
Set:	–	-	-
Get:	GET	Administrator	Public

Description		Syntax	
Set:	-	-	
Get:	Get file	#GET`SP`*file_name*`CR`	

Response

Multi-line:
~`nn`@GET`SP`*file_name*,*file_size*`SP`READY`CR LF`
 contents
~`nn`@GET`SP`*file_name*`SP`OK`CR LF`

Parameters

file_name – name of file to get contents
contents – byte stream of file contents
file_size – size of file (device sends it in response to give user a chance to get ready)

Response Triggers

K-Config Example

Get a file named "test".
"#GET test",0x0D

GPIO-CFG

Functions		Permission	Transparency
Set:	GPIO-CFG	End User	Public
Get:	GPIO-CFG?	End User	Public

Description		Syntax
Set:	Set HW GPIO configuration	#GPIO-CFG‹SP› *HwGpioNumber,HwGpioType,HwGpioDir,Pullup*‹CR›
Get:	Get HW GPIO configuration	#GPIO-CFG‹SP›Hw*GpioNumber*‹CR›

Response

~‹nn›@GPIO-CFG‹SP›*HwGpioNum,HwGpioType,HwGpioDir*‹CR LF›

Parameters

HwGpioNum – hardware GPIO number: 1-n
HwGpioType – hardware GPIO type: 0 (analog), 1 (digital)
HwGpioDir – hardware GPIO direction: 0 (input), 1 (output)
Pullup – enable/disable pull-up: 0 (disable), 1 (enable)

Response Triggers

Notes

K-Config Example

Configure GPIO 2 to analog input with pullup disabled:
"#GPIO-CFG 2,0,0,0",0x0D

GPIO-STATE

Functions		Permission	Transparency
Set:	GPIO-STATE	End User	Public
Get:	GPIO-STATE?	End User	Public

Description		Syntax
Set:	Set HW GPIO state	#GPIO-STATE‹SP›*HwGpioNumber,HwGpioState*‹CR›
Get:	Get HW GPIO state	#GPIO-STATE‹SP›*HwGpioNumber*‹CR›

Response

~‹nn›@GPIO-STATE‹SP›*HwGpioNum,HwGpioState*‹CR LF›

Parameters

HwGpioNumber – hardware GPIO number: 1-n
HwGpioState – hardware GPIO state (see note below)

Response Triggers

Notes

GPIO-STATE? can only be sent in digital out mode and the answer is 0 (low), 1 (high). In all other modes an error message is sent
The device uses this command to notify the user of any change regarding the step and voltage in:
In digital mode the answer is 0 (low), 1 (high)
In analog mode the answer is 0 to 100

K-Config Example

Configure GPIO 2 to low state:
"#GPIO-STATE 2,0",0x0D

GPIO-STEP

Functions		Permission	Transparency
Set:	`GPIO-STEP`	End User	Public
Get:	`GPIO-STEP?`	End User	Public
Description		**Syntax**	
Set:	Set HW GPIO step	`#GPIO-STEP`SP`HwGpioNumber,Step`CR	
Get:	Get HW GPIO step	`#GPIO-STEP`SP`HwGpioNumber`CR	

Response

~nn@GPIO-STEPSP*HwGpioNumber,NumOfStep,CurrentStep*CR LF

Parameters

HwGpioNumber – HW GPIO number: `1-n`
NumOfStep – the configuration step (see note below)
CurrentStep – the actual step depending on the measured voltage

Response Triggers

Notes

In digital mode the response is `2`
In analog mode the response is `1` to `100`
In other modes an error is returned

K-Config Example

Set GPIO 2 step 1 to 50:
"`#GPIO-STEP 2,1,50`",0x0D

GPIO-THR

Functions		Permission	Transparency
Set:	`GPIO-THR`	End User	Public
Get:	`GPIO-THR?`	End User	Public
Description		**Syntax**	
Set:	Set HW GPIO voltage levels	`#GPIO-THR`SP`HwGpioNumber,LowLevel,HighLevel`CR	
Get:	Get HW GPIO voltage levels	`#GPIO-THR?`SP`HwGpioNumber`CR	

Response

~nn@GPIO-THRSP*HwGpioNumber,LowLevel,HighLevel*CR LF

Parameters

HwGpioNumber – hardware GPIO number: `1-n`
LowLevel – voltage `500` to `28000` millivolts
HighLevel – voltage `2000` to `30000` millivolts

Response Triggers

Notes

K-Config Example

Set GPIO 1 voltage levels between 600mV to 15000mV:
"`#GPIO-THR 1,600,15000`",0x0D

GPIO-VOLT

Functions		Permission	Transparency
Set:	-	-	-
Get:	`GPIO-VOLT?`	End User	Public
Description		**Syntax**	
Set:			
Get:	Get voltage levels of HW GPIO	`#GPIO-VOLT?`SP *HwGpioNumber* CR	

Response

~nn@**GPIO-VOLT**SP *HwGpioNumber,Voltage* CR LF

Parameters

HwGpioNumber – hardware GPIO number: `1-n`
Voltage – voltage `0` to `30000` millivolts

Response Triggers

Notes

This command is not available in digital out mode

K-Config Example

`"#GPIO-VOLT? 1",0x0D`

HELP

Functions		Permission	Transparency
Set:	**-**	-	-
Get:	`HELP`	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get command list or help for specific command	1. `#HELP`CR 2. `#HELP`SP*COMMAND_NAME*CR	

Response

1. Multi-line: ~nn@Device available protocol 3000 commands:CR LF*command,*SP
*command...*CR LF
2. Multi-line: ~nn@HELP SP*command:*CR LF*description*CR LFUSAGE:*usage*CR LF

Parameters

COMMAND_NAME – name of a specific command

Response Triggers

Notes

To get help for a specific command use: HELP SPCOMMAND_NAME CR LF

K-Config Example

`"#HELP",0x0D`

LOGIN

Functions		Permission	Transparency
Set:	LOGIN	Not Secure	Public
Get:	LOGIN?	Not Secure	Public
Description		**Syntax**	
Set:	Set protocol permission	#LOGIN`SP`*login_level,password*`CR`
Get:	Get current protocol permission level	#LOGIN?`CR`
Response			
Set: ~`nn`@LOGIN`SP`*login_level,password*`SP`OK`CR LF` or ~`nn`@LOGIN`SP`ERR`SP`004`CR LF` (if bad password entered) Get: ~`nn`@LOGIN`SP`*login_level*`CR LF`			
Parameters			
login_level – level of permissions required: User, Admin *password* – predefined password (by PASS command). Default password is an empty string			
Response Triggers			
Notes			
When the permission system is enabled, LOGIN enables running commands with the User or Administrator permission level When set, login must be performed upon each connection The permission system works only if security is enabled with the SECUR command. It is not mandatory to enable the permission system in order to use the device			
K-Config Example			
Set the protocol permission level to Admin (when the password defined in the PASS command is 33333): "#LOGIN Admin,33333",0x0D			

LOGOUT

Functions		Permission	Transparency
Set:	LOGOUT	Not Secure	Public
Get:	**-**	-	-
Description		**Syntax**	
Set:	Cancel current permission level	#LOGOUT`CR`
Get:	-	-
Response			
~`nn`@LOGOUT`SP`OK`CR LF`			
Parameters			
Response Triggers			
Notes			
Logs out from User or Administrator permission levels			
K-Config Example			
"#LOGOUT",0x0D			

MACH-NUM

Functions		Permission	Transparency
Set:	MACH-NUM	End User	Public
Get:		-	-
Description		**Syntax**	
Set:	Set machine number (device ID)	#MACH-NUM`SP`*machine_number*`CR`	
Get:	-	-	
Response			
~`nn`@MACH-NUM`SP`*machine_number*`CR LF`			
Parameters			
machine_number – New machine number			
Response Triggers			
Notes			
The new machine number is only set after restarting the device.			
K-Config Example			
"#MACH-NUM 4",0x0D			

MODEL

Functions		Permission	Transparency
Set:	**-**	-	-
Get:	MODEL?	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get device model	#MODEL?`CR`	
Response			
~`nn`@MODEL`SP`*model_name*`CR LF`			
Parameters			
model_name – String of up to 19 printable ASCII chars			
Response Triggers			
Notes			
This command identifies equipment connected to Step-in master products and notifies of identity changes to the connected equipment. The Matrix saves this data in memory to answer REMOTE-INFO requests			
K-Config Example			
"#MODEL?",0x0D			

NAME

Functions		Permission	Transparency
Set:	NAME	Administrator	Public
Get:	NAME?	End User	Public
Description		**Syntax**	
Set:	Set machine (DNS) name	#NAME SP machine_name CR	
Get:	Get machine (DNS) name	#NAME? CR	
Response			
Set: ~nn@NAME SP machine_name CR LF Get: ~nn@NAME? SP machine_name CR LF			
Parameters			
machine_name - string of up to 15 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)			
K-Config Example			
Set machine name to FC-7P-4321: "#NAME FC-7P-4321",0x0D			

NAME-RST

Functions		Permission	Transparency
Set:	NAME-RST	Administrator	Public
Get:	-	-	-
Description		**Syntax**	
Set:	Reset machine (DNS) name to factory default	#NAME-RST CR	
Get:	-	-	
Response			
~nn@NAME-RST SP OK CR LF			
Parameters			
Response Triggers			
Notes			
Factory default of machine (DNS) name is "KRAMER_" + 4 last digits of device serial number			
K-Config Example			
"#NAME-RST",0x0D			

NET-DHCP

Functions		Permission	Transparency
Set:	`NET-DHCP`	Administrator	Public
Get:	`NET-DHCP?`	End User	Public
Description		**Syntax**	
Set:	Set DHCP mode	`#NET-DHCP`SP`mode`CR	
Get:	Get DHCP mode	`#NET-DHCP?`CR	
Response			
~`nn`@NET-DHCPSP`mode`CR LF			
Parameters			
`mode` – 0 (do not use DHCP. Use the IP address set by the factory or the `NET-IP` command), 1 (try to use DHCP. If unavailable, use the IP address set by the factory or the `NET-IP` command)			
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 `NAME` command. You can also get an assigned IP by direct connection to USB or RS-232 protocol port if available			
Consult your network administrator for correct settings			
K-Config Example			
Enable DHCP mode, if available:			
"`#NET-DHCP 1`",0x0D			

NET-GATE

Functions		Permission	Transparency
Set:	`NET-GATE`	Administrator	Public
Get:	`NET-GATE?`	End User	Public
Description		**Syntax**	
Set:	Set gateway IP	`#NET-GATE`SP`ip_address`CR	
Get:	Get gateway IP	`#NET-GATE?`CR	
Response			
~`nn`@NET-GATESP`ip_address`CR LF			
Parameters			
`ip_address` – gateway IP address, in the following format: `xxx.xxx.xxx.xxx`			
Response Triggers			
Notes			
A network gateway connects the device via another network, possibly over the Internet. Be careful of security problems. Consult your network administrator for correct settings.			
K-Config Example			
Set the gateway IP address to 192.168.0.1:			
"`#NET-GATE 192.168.000.001`",0x0D			

NET-IP

Functions		Permission	Transparency
Set:	`NET-IP`	Administrator	Public
Get:	`NET-IP?`	End User	Public
Description		**Syntax**	
Set:	Set IP address	`#NET-IP`SP`ip_address`CR	
Get:	Get IP address	`#NET-IP?`CR	
Response			
~nn`@NET-IP`SP`ip_address`CR LF			
Parameters			
`ip_address` – IP address, in the following format: `xxx.xxx.xxx.xxx`			
Response Triggers			
Notes			
Consult your network administrator for correct settings			
K-Config Example			
Set the IP address to 192.168.1.39: "#NET-IP 192.168.001.039",0x0D			

NET-MAC

Functions		Permission	Transparency
Set:	**-**	-	-
Get:	`NET-MAC?`	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get MAC address	**#NET-MAC?**CR	
Response			
~nn`@NET-MAC`SP`mac_address`CR LF			
Parameters			
`mac_address` – unique MAC address. Format: `XX-XX-XX-XX-XX-XX` where `X` is hex digit			
Response Triggers			
Notes			
K-Config Example			
"#NET-MAC?",0x0D			

NET-MASK

Functions		Permission	Transparency
Set:	NET-MASK	Administrator	Public
Get:	NET-MASK?	End User	Public
Description		**Syntax**	
Set:	Set subnet mask	#NET-MASK SP net_mask CR	
Get:	Get subnet mask	#NET-MASK? CR	
Response			
~nn@NET-MASK SP net_mask CR LF			
Parameters			
net_mask – format: xxx.xxx.xxx.xxx			
Response Triggers			
The subnet mask limits the Ethernet connection within the local network Consult your network administrator for correct settings			
Notes			
K-Config Example			
Set the subnet mask to 255.255.0.0: "#NET-MASK 255.255.000.000",0x0D			

PASS

Functions		Permission	Transparency
Set:	PASS	Administrator	Public
Get:	PASS?	Administrator	Public
Description		**Syntax**	
Set:	Set password for login level	#PASS SP login_level,password CR	
Get:	Get password for login level	#PASS? SP login_level CR	
Response			
~nn@PASS SP login_level,password CR LF			
Parameters			
login_level – level of login to set: User, Admin password – password for the login_level. Up to 15 printable ASCII chars.			
Response Triggers			
Notes			
The default password is an empty string			
K-Config Example			
Set the password for the Admin protocol permission level to 33333: "#PASS Admin,33333",0x0D			

PORT-LOCK

Functions		Permission	Transparency
Set:	PORT-LOCK	End User	Public
Get:	PORT-LOCK?	End User	Public
Description		**Syntax**	
Set:	Set the port lock	#PORT-LOCK[SP]*PortNumber,LockState*[CR]
Get:	Get the port lock state	#PORT-LOCK?[SP]*PortNumber*[CR]

Response
~[nn]@PORT-LOCK[SP]*PortNumber,LockState*[CR LF]

Parameters
PortNumber – port number: 1-n *LockState* – 1 (lock), 0 (unlock)

Response Triggers

Notes

K-Config Example
Lock port 3: "#PORT-LOCK 3, 1",0x0D

PORT-TYPE

Functions		Permission	Transparency
Set:	PORT-TYPE	End User	Public
Get:	PORT-TYPE?	End User	Public
Description		**Syntax**	
Set:	Change the port type	#PORT-TYPE[SP]*PortNumber,PortType,PortName*[CR]
Get:	Get the port type	#PORT-TYPE?[SP]*PortNumber*[CR]

Response
~[nn]@PORT-TYPE[SP]*PortNumber,PortType,PortName*[CR LF]

Parameters
PortNumber – Port number: 1-n *PortType* – 3 (Relay), 4 (IR), 5 (GPIO) *PortName* – A string describing the port type

Response Triggers

Notes

K-Config Example
Change port 3 to relay and name it blinds: "#PORT-TYPE 3,3,blinds",0x0D

RELAY-STATE

Functions		Permission	Transparency
Set:	RELAY-STATE	End User	Public
Get:	RELAY-STATE?	End User	Public
Description		**Syntax**	
Set:	Set relay state	#RELAY-STATE␣SP␣*RelayNumber,RelayState*␣CR␣	
Get:	Get relay state	#RELAY-STATE?␣SP␣*RelayNumber*␣CR␣	
Response			
~ nn @RELAY-STATE␣SP␣*RelayNumber,RelayState*␣CR LF␣			
Parameters			
RelayNumber – relay number: 1-4 *RelayState* – relay state 0 (open), 1 (close)			
Response Triggers			
Notes			
K-Config Example			
Close relay 2: "#RELAY-STATE 2,1",0x0D			

PROT-VER

Functions		Permission	Transparency
Set:	-	-	-
Get:	PROT-VER?	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get device protocol version	#PROT-VER?␣CR␣	
Response			
~ nn @PROT-VER␣SP␣3000:*version*␣CR LF␣			
Parameters			
version – XX.XX where X is a decimal digit			
Response Triggers			
Notes			
K-Config Example			
"#PROT-VER?",0x0D			

RESET

Functions		Permission	Transparency
Set:	RESET	Administrator	Public
Get:	**-**	-	-
Description		**Syntax**	
Set:	Reset device	#RESET CR	
Get:	-	-	
Response			
~nn@RESET SP OK CR LF			
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.			
K-Config Example			
"#RESET",0x0D			

SECUR

Functions		Permission	Transparency
Set:	SECUR	Administrator	Public
Get:	SECUR?	Not Secure	Public
Description		**Syntax**	
Set:	Start/stop security	#SECUR SP security_mode CR	
Get:	Get current security state	#SECUR? CR	
Response			
~nn@SECUR SP security_mode CR LF			
Parameters			
security_mode – 1 (On / enable security), 0 (Off / disable security)			
Response Triggers			
Notes			
The permission system works only if security is enabled with the SECUR command			
K-Config Example			
Enable the permission system: "#SECUR 0",0x0D			

SN

Functions		Permission	Transparency
Set:	-	-	-
Get:	SN?	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get device serial number	#SN?CR	
Response			
~nn@SNSP*serial_number*CR LF			
Parameters			
serial_number – 11 decimal digits, factory assigned			
Response Triggers			
Notes			
This device has a 14 digit serial number, only the last 11 digits are displayed			
K-Config Example			
"#SN?",0x0D			

TIME

Functions		Permission	Transparency
Set:	TIME	Administrator	Public
Get:	TIME?	End User	Public
Description		**Syntax**	
Set:	Set device time and date	#TIMESP*day_of_week,date,time*CR	
Get:	Get device time and date	#TIME?CR	
Response			
~nn@TIMESP*day_of_week,date,time*CR LF			
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			
K-Config Example			
Set the time to 09:45, Tuesday, 01-July-2015: "#TIME TUE,01-07-2015,09:45:00",0x0D			

TIME-LOC

Functions		Permission	Transparency
Set:	`TIME-LOC`	End User	Public
Get:	`TIME-LOC?`	End User	Public
Description		**Syntax**	
Set:	Set local time offset from UTC/GMT	`#TIME-LOC`SP`UTC_off,DayLight`CR	
Get:	Get local time offset from UTC/GMT	`#TIME-LOC?`CR	
Response			
`~`nn`@TIME-LOC`SP`UTC_off,DayLight`CR LF			
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			
K-Config Example			
Set the time offset to GMT +2, standard time: `"#TIME-LOC 2,0",0x0D`			

TIME-SRV

Functions		Permission	Transparency
Set:	`TIME-SRV`	Administrator	Public
Get:	`TIME-SRV?`	End User	Public
Description		**Syntax**	
Set:	Set time server	`#TIME-SRV`SP`mode,time_server_IP,time_server_Sync_Hour,`CR	
Get:	Get time server	`#TIME-SRV?`CR	
Response			
`~`nn`@TIME-SRV`SP`mode, time_server_IP, time_server_Sync_Hour,server_status`CR LF			
Parameters			
`mode` – `0` (OFF), `1` (ON) `time_server_IP` – time server IP address `time_server_Sync_Hour` – hour in day for time server sync `server_status` – *ON/OFF*			
Response Triggers			
Notes			
This command is needed for setting UDP timeout for the current client list			
K-Config Example			
Connect the device to a time server at a given IP address, activate and sync at 6AM: `"#TIME-SRV 1,xxx.xxx.xxx.xxx,06",0x0D`			

VERSION

Functions		Permission	Transparency
Set:	-	-	-
Get:	VERSION?	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get firmware version number	#VERSION?CR	
Response			
~nn@VERSION SP firmware_version CR LF			
Parameters			
firmware_version – XX.XX.XXXX where the digit groups are: major.minor.build version			
Response Triggers			
Notes			
K-Config Example			
"#VERSION?",0x0D			

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.

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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. Kramer fiber optic cables, adapter-size fiber optic extenders, pluggable optical modules, active cables, cable retractors, ring mounted adapters, portable power chargers, Kramer speakers, and Kramer touch panels are covered by a standard one (1) year warranty. Kramer 7-inch touch panels purchased on or after April 1st, 2020 are covered by a standard two (2) year warranty.
3. 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 lifetime 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.

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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. If a direct or similar replacement product is supplied, the original product's end warranty date remains unchanged and is transferred to the replacement 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.

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.

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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.

KRAMER

C E ♻ **22 PAP**

⚠ **SAFETY WARNING**
Disconnect the unit from the power supply before opening and servicing

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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.

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