KRAMER

USER MANUAL

MODEL:

FC-7P

Ethernet Gateway − GPIO/Relay

P/N: 2900-300615 Rev 1

Scan for full manual

FC-7P Quick Start Guide

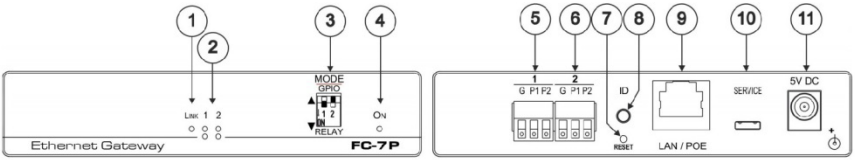
This guide helps you install and use your **FC-7P** for the first time.

Go to **www.kramerav.com/downloads/FC-7P** to download the latest user manual and check if firmware upgrades are available.

Step 1: Check what's in the box

- ☑ **FC-7P** Ethernet Gateway
- ☑ 1 USB-A to USB mini cable
- ☑ 4 Rubber feet
- ☑ 1 Quick start guide
- ☑ 1 Bracket set

Step 2: Get to know your FC-7P

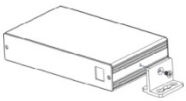


#	Feature	Function
1	LINK LED	Shows the Ethernet link is active
2	Activity LEDs Ports 1 and 2, white (upper) and blue (lower)	Show the transmission status of port 1 and port 2: When set as GPIO, the white LED indicates active IO-P1 and blue LED indicates active IO-P2 When set as RELAY, the white LED indicates active Relay-P1 and blue LED indicates active Relay-P2
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

Step 3: Install the FC-7P

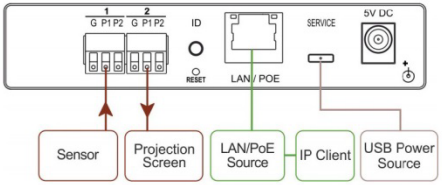
You can mount this Kramer TOOLS™ next to a USB power source behind an AV device, in the ceiling, on a desk top, wall or similar area. Install **FC-7P** using one of the following methods:

- Attach the rubber feet and place the unit on a flat surface.
- Fasten a bracket (included) on each side of the unit and attach it to a flat surface. For more information go to **www.kramerav.com/downloads/FC-7P**
- Mount the unit in a rack using an optional **RK-3T** rack adapter.



Step 4: Connect the inputs and outputs

Always switch OFF the power on each device before connecting it to your **FC-7P**. For best results, we recommend that you always use Kramer high-performance cables to connect controlled equipment to the **FC-7P**.



Step 5: Connect the power

Connect the PoE or USB power source and/or an optional 5V DC power supply to the **FC-7P** and plug it into the mains electricity.

Safety Instructions

Caution: There are no operator serviceable parts inside the unit.
Warning: Use only the Kramer Electronics power supply that is provided with the unit.
Warning: Disconnect the power and unplug the unit from the wall before installing.
See www.KramerAV.com for updated safety information.

Step 6: Configure and operate the FC-7P

Note: The **FC-7P** is shipped from the factory with DHCP enabled and a random IP address. To connect the **FC-7P** on first installation, you must identify what IP address has been 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 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 rear 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.

To browse the FC-7P Web UI (User Interface) using factory default settings:
Use the default host name: **FC-7P-xxxx**, where xxxx are the last four digits of the serial number of the device.

To configure and operate the FC-7P:

1. Using the device Web UI, configure the control gateway:
   - Set DHCP or assign a static IP address
   - Associate IP port(s) with the relevant port(s)
   - Configure the relevant port parameters
2. Configure IP client connection port(s) on a Kramer control or any other control software application.
3. Set the control application to use the control gateway ports for sending and receiving control communication over the IP connections.

FC-7P Function Table

Port IO Function	Terminal Block Connections			IO Port Default	TCP Default Port [P1/P2]	Activity LEDs P1-white P2-blue	Comment
	G	P1	P2				
GPIO	Ground	IO_1	IO_2	Digital In x 2	5000	ON when IO ports are active	GPIO Analog in & 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

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1 Introduction

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

Our 1,000-plus different models now appear in 14 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; GROUP 11: Sierra Video Products; GROUP 12: Digital Signage; GROUP 13: Audio; and GROUP 14: Collaboration.

Congratulations on purchasing your Kramer **FC-7P** *Ethernet Gateway* − GPIO/Relay that is ideal for use in the following 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

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 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).

2.1 Achieving the Best Performance

To achieve the best performance:

- For optimum range and performance, use the recommended Kramer cables available at www.kramerav.com/product/FC-7P
- Do not secure the cables in tight bundles or roll the slack into tight coils
- Avoid interference from neighbouring electrical appliances that may adversely influence signal quality
- Position your **FC-7P** 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 Kramer Electronics power supply that is provided with the unit

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 *www.kramerav.com/support/recycling/*.

3 Overview

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.

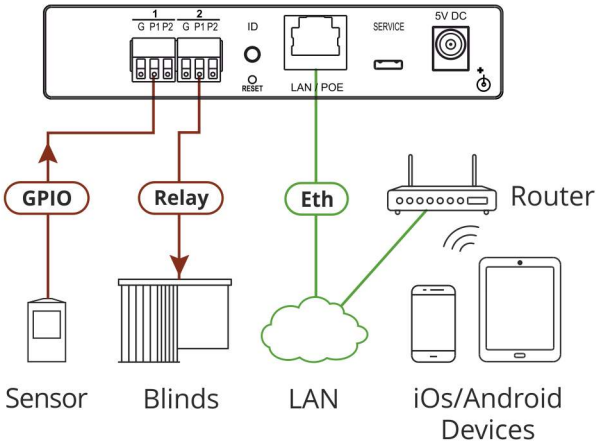

Figure 1: FC-7P Controlling Devices Remotely Using K-Touch 3.0 over a LAN

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**.

4 Defining the FC-7P Ethernet Gateway − GPIO/Relay

This section defines the **FC-7P**.

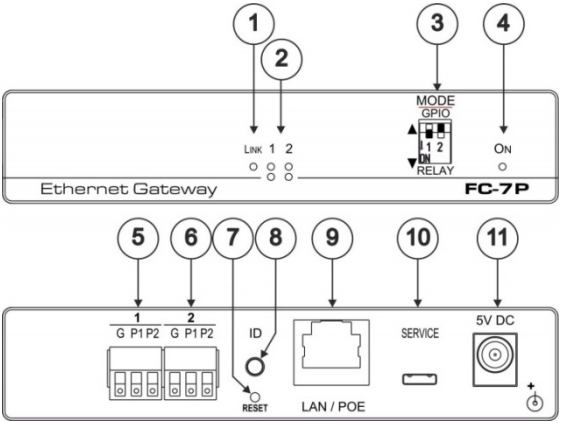

Figure 2: FC-7P Ethernet Gateway − GPIO/Relay

#		
1	LINK LED	Shows the Ethernet link is active
2	Activity LEDs Ports 1 and 2, white (upper) and blue (lower)	Show the transmission status of port 1 and port 2: When set as GPIO, the white LED indicates active IO-P1 and blue LED indicates active IO-P2 When set as RELAY, the white LED indicates active Relay-P1 and blue LED indicates active Relay-P2
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)
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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
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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

5 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 Section 5.1)
- Configuring an Ethernet connection on the PC (see Section 5.2)

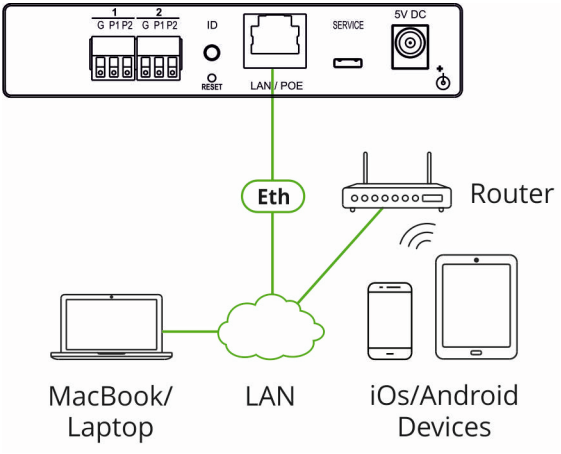


Figure 3: Connecting the FC-7P for Initial Configuration

5.1 Configuring the FC-7P Ethernet Gateway − GPIO/Relay

Note: 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 Section 6.1).
2. Using a Web browser and the relevant IP address or host name (see Section 10), browse the General Info home page (see Figure 11).
3. Click **Device Settings** to browse to the Device Settings page, (see Figure 12).
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 13).
7. Enter the IP address, mask and gateway for static IP addressing and click **Set**. We recommend that you set a meaningful host name.
   Note: 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.
8. Click **GPIO Port Settings** to browse to the GPIO Port Settings page, (see Section 7.4). 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 Section 7.5). Here you can set the relays on or off.

12. If required, click **Security** (see Section 7.6) 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**).

5.2 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.

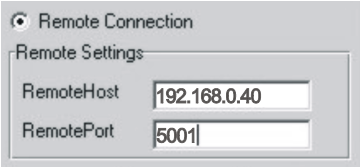


Figure 4: Configuring a Remote Connection

6 Connecting the FC-7P

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.

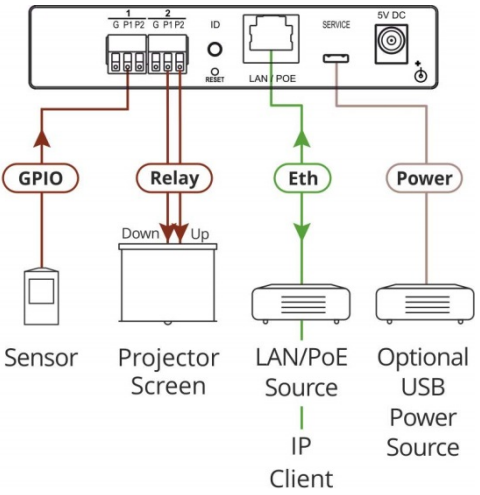


Figure 5: Connecting the FC-7P Ethernet Gateway − GPIO/Relay

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 Figure 6.

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 connections shown in Figure 6.

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

Figure 6: Terminal Block Connections

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).

Note: 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.

6.1 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 Section 6.1.1)
- Via a network hub, switch, or router, using a straight-through cable (see Section 6.1.2)

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.

6.1.1 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 7.

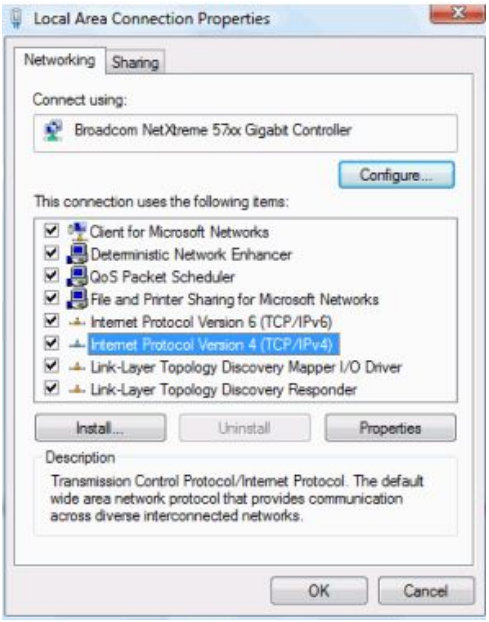


Figure 7: Local Area Connection Properties Window

4. Highlight **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**. The Internet Protocol Properties window relevant to your IT system appears as shown in Figure 8 or Figure 9.

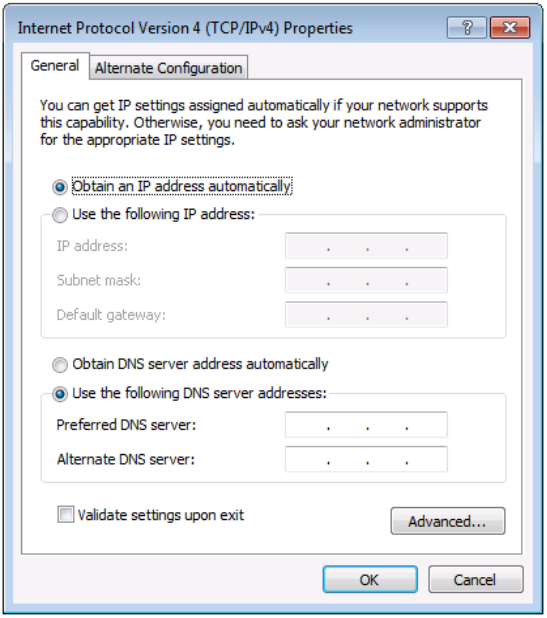


Figure 8: Internet Protocol Version 4 Properties Window

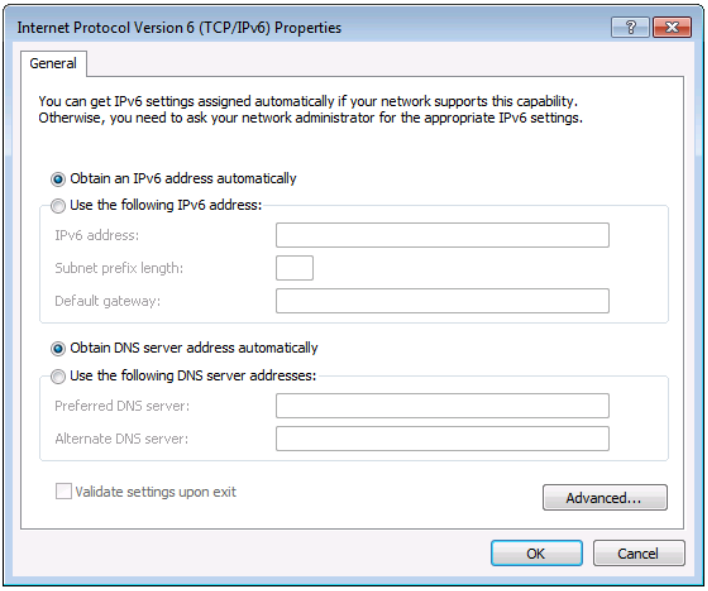


Figure 9: Internet Protocol Version 6 Properties Window

5. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in Figure 10.
   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.

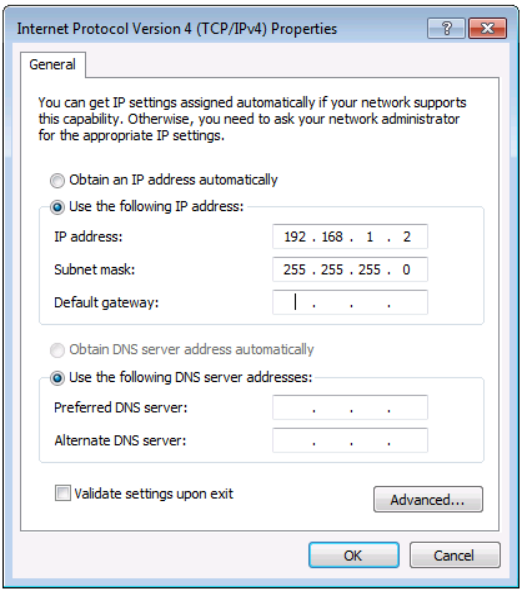


Figure 10: Internet Protocol Properties Window

6. Click **OK**.

7. Click **Close**.

6.1.2 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.

6.1.3 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)

6.1.4 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

7 Remote Operation via the Web UI

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:

- Perform the initial configuration in Section 5.1 and connecting via Ethernet in Section 6.1
- Ensure that your browser is supported (see Section 9)

7.1 Browsing the Web UI

To browse the Web UI:

1. Open your Internet browser. Type the IP address of the device (see Section 5.1) in the Address bar of your browser.

The Loading page appears followed shortly by the General Info page shown in Figure 11.

The General Info page displays the following:

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

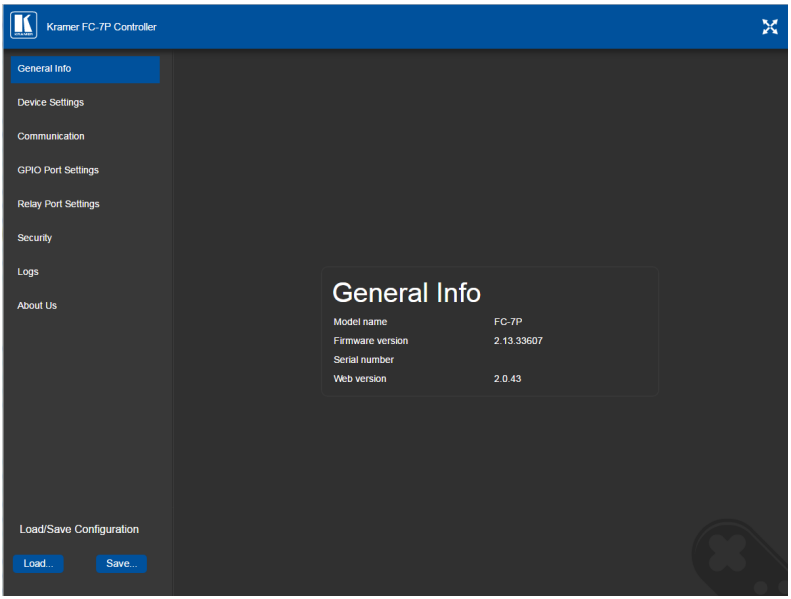


Figure 11: General Info Page

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.

Note: 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 12)	Model Name Time Zone Daylight Savings Time mode Use Time Server mode Time Server Address Sync Every Day time
Communication (Figure 13)	UDP Port TCP Port
GPIO Port Settings (Figure 14)	GPIO Port Trigger Type Pull-up Resistor Threshold VDC Range Min Threshold VDC Range Max Maximum Reported Steps

7.2 Setting Device Name and Time Functions

The Device Settings page (Figure 12) 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

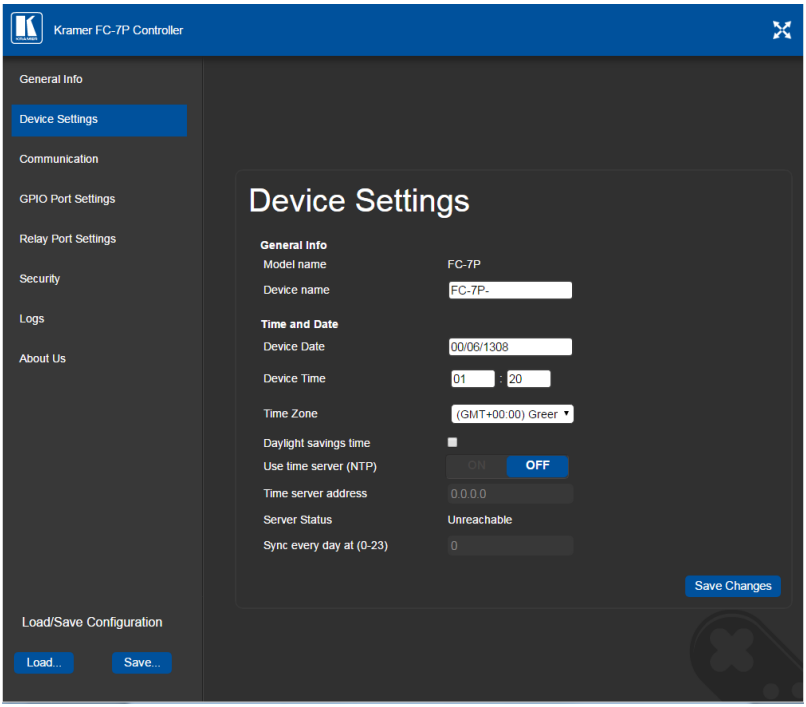


Figure 12: Device Settings Page

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 12.
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**.

7.3 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

Note: The default IP address setting for the device is DHCP.

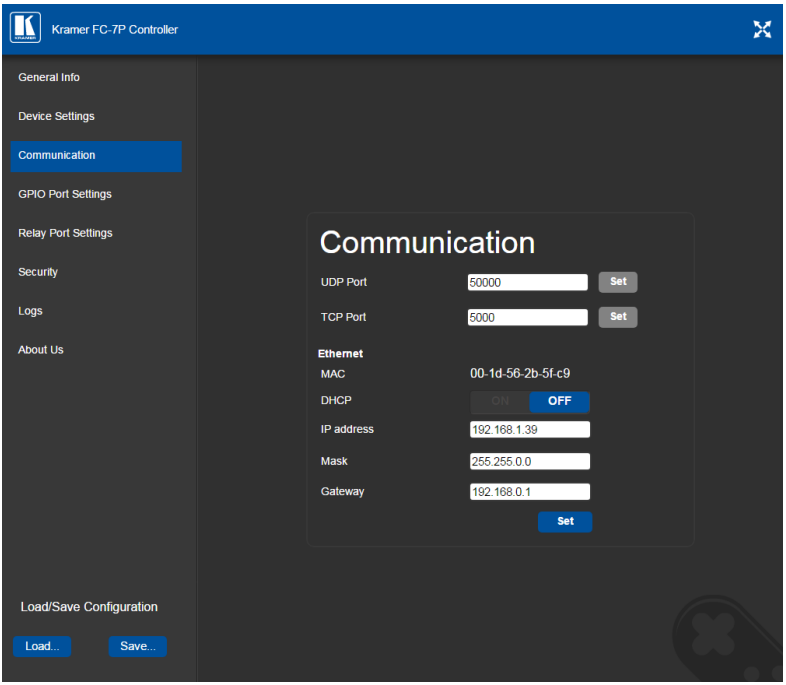


Figure 13: Communication Page

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

7.4 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.

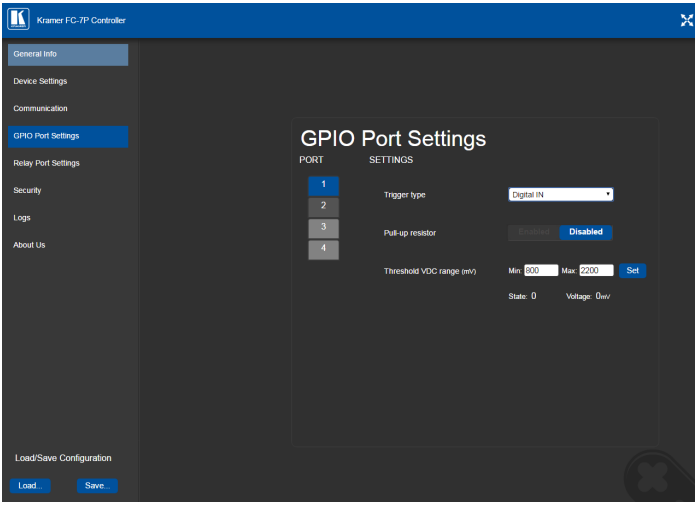


Figure 14: GPIO Port Settings Page

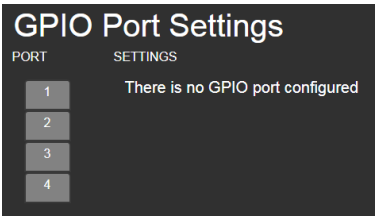
The GPIO Port Setting page allows you to configure the following for each GPIO port:

- 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.

Note: The default parameter settings change depending on which trigger type is selected.

Note: 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:



7.4.1 Setting Digital In Trigger Parameters

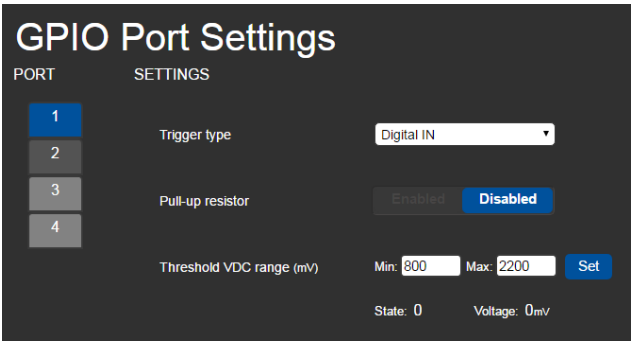


Figure 15: GPIO Port Settings Page Digital IN

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.

7.4.2 Setting Digital Out Trigger Parameters

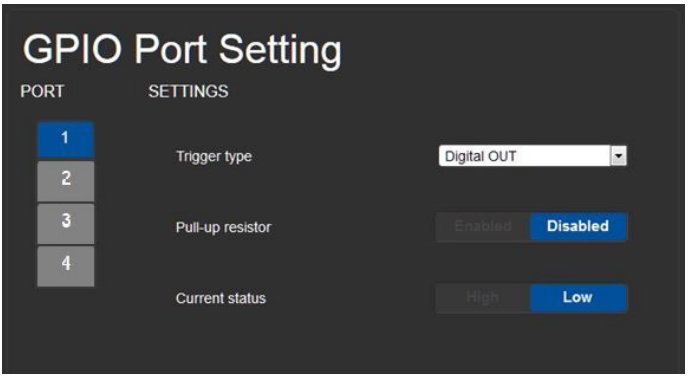


Figure 16: GPIO Port Settings Page Digital OUT

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 17 is displayed.

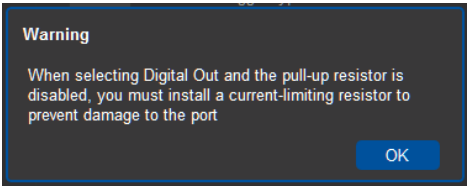


Figure 17: Digital Out Selection Warning Popup

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.
  Note: 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.

7.4.3 Setting Analog In Trigger Parameters

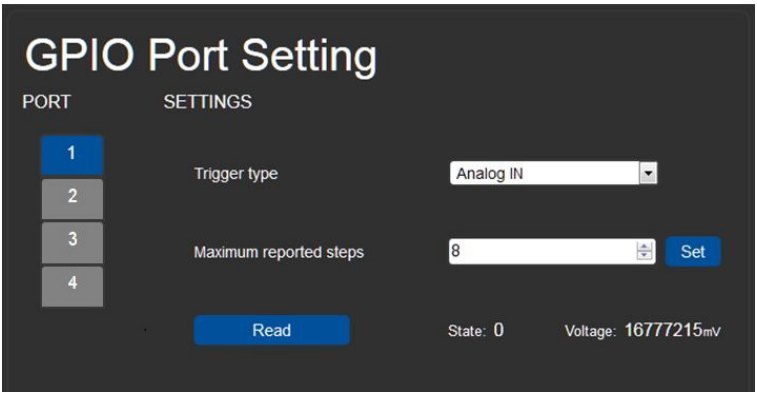


Figure 18: GPIO Port Settings Page Analog IN

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.

7.5 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.

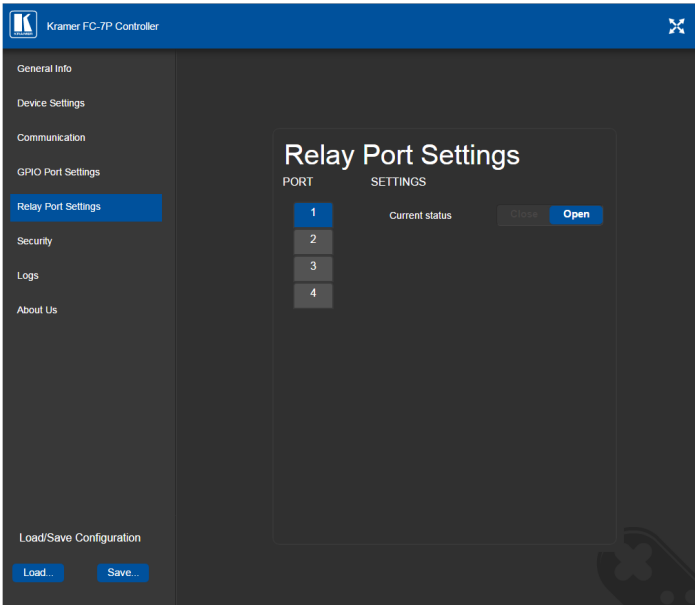


Figure 19: Relay Port Settings Page

The relay ports have the following characteristics:

- Rated at 30V DC and 1A
- Default state of normally open

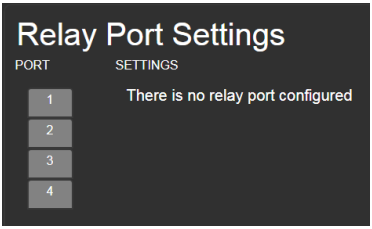
- A non-latching relay function, that is, the contact is left open when unpowered or on power up state. This means that if a relay is closed and power is lost, the relay returns to its default state. To return it to its pre-power loss state, the setting must be changed using either the Web UI or a P3000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

Note: 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:



7.6 Activating Security

The Security page allows you to turn logon authentication on or off.

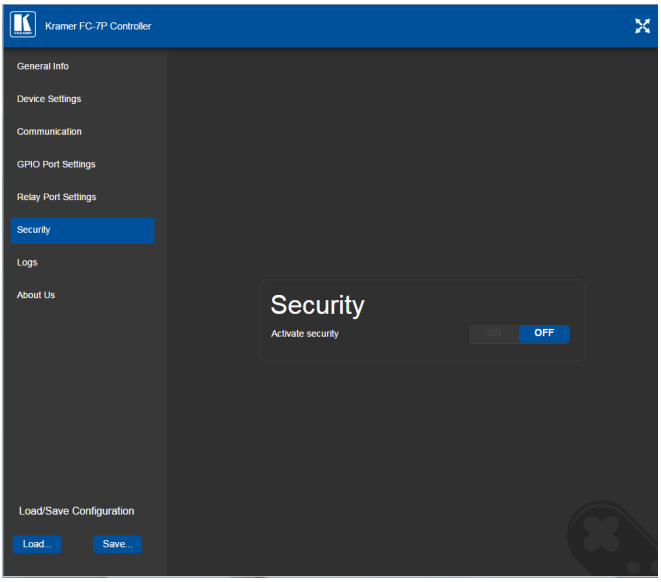


Figure 20: Security Page

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 21.

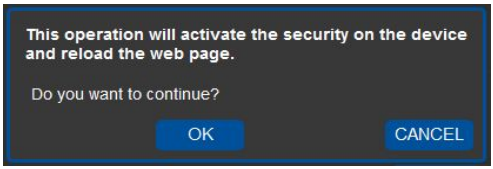


Figure 21: Security Confirmation Popup

2. Click **OK**.
   The Authentication Required popup is displayed as shown in Figure 22.

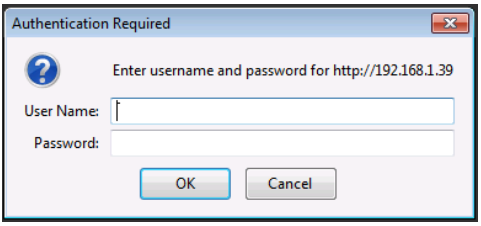


Figure 22: Authentication Required Popup

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 23 is displayed.

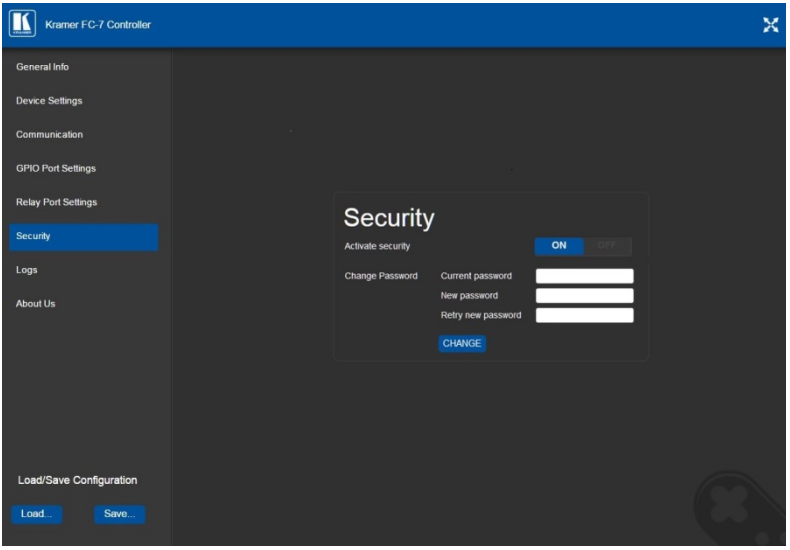


Figure 23: Security Activated Page

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

7.7 Using the Logs Page

The Logs page allows you to:

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

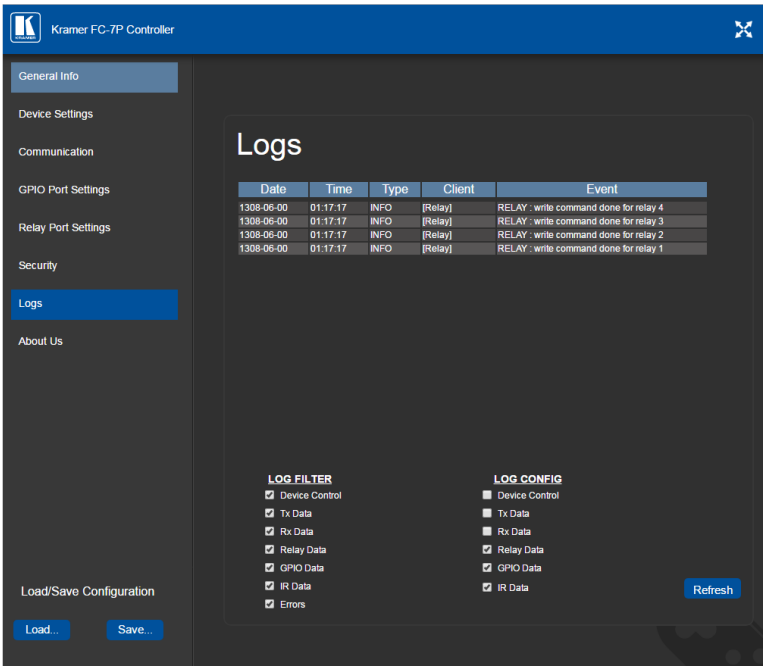


Figure 24: Logs Page

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.

7.8 Kramer Information

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

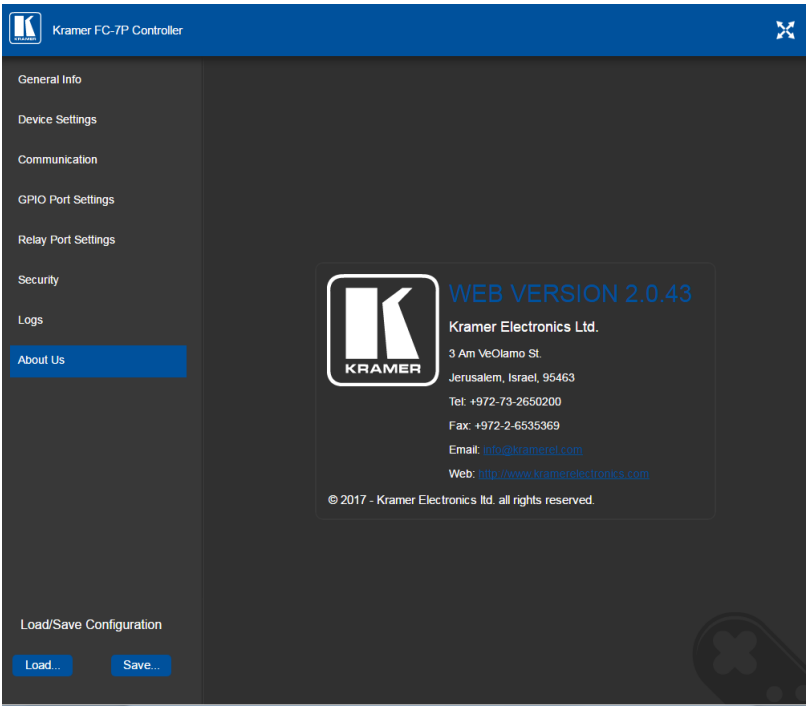


Figure 25: About Us Page

8 Using FC-7P Operations

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

8.1 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.

8.2 Upgrading the Firmware

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

9 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, 250mA
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		

10 Default Parameters

Note: 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

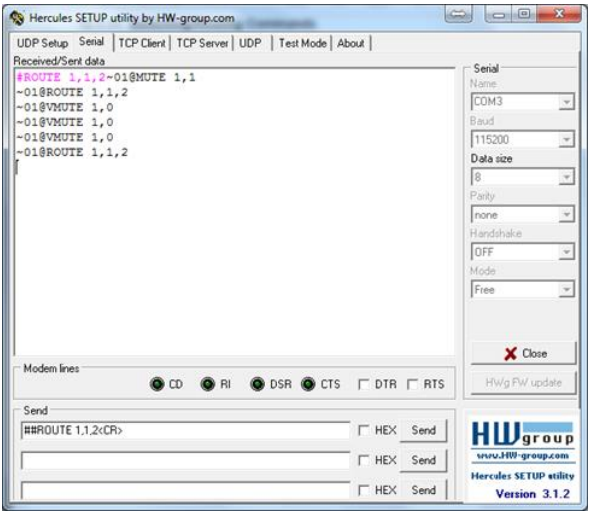
Default Logon Authentication

Web UI Access	
User name:	Admin
Password:	Admin

11 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**. For example, a basic video input switching command that routes a layer 1 video signal to HDMI out 1 from HDMI input 2 (`ROUTE 1,1,2`), is entered as follows:

- Terminal communication software, such as Hercules:



The framing of the command varies according to the terminal communication software.

- K-Touch Builder (Kramer software):

'Device Code (17)' PROPERTIES	
name	Device Code (17)
data	#ROUTE 1,1,2\x0D

- 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.

11.1 Kramer Protocol 3000 – Syntax

11.1.1 Host Message Format

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

11.1.1.1 Simple Command

Command string with only one command without addressing:

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

11.1.1.2 Command String

Formal syntax with commands concatenation and addressing:

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

11.1.2 Device Message Format

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

11.1.2.1 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)

11.1.3 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.

11.1.4 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.

11.1.5 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.

11.1.6 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.

11.1.7 Maximum String Length

64 characters

11.2 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

11.3 Kramer Protocol 3000 – Detailed Commands

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

11.3.1

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			

11.3.2 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

11.3.3 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
```

11.3.4 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
```

11.3.5 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
```

11.3.6 DEL

Functions		Permission	Transparency
Set:	DEL	Administrator	Public
Get:	-	-	-
Description		**Syntax**	
Set:	Delete file	#DELSP*file_name*CR	
Get:			
Response			
~nn@DELSP*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			

11.3.7 DIR

Functions		Permission	Transparency
Set:	DIR	Administrator	Public
Get:	-	-	-
Description		**Syntax**	
Set:	List files in device	#DIRCR	
Get:	-	-	
Response			
Multi-line: ~nn@DIRCR LF *file_name*TAB *file_size*SPbytes,SPID:SP*file_id*CR LF TAB*free_size*SPbytes.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			

11.3.8 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

11.3.9 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

11.3.10 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			

11.3.11 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			

11.3.12 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_FREESP*free_size*CR LF			
Parameters			
free_size – free size in device file system in bytes			
Response Triggers			
K-Config Example			
"#FS-FREE?",0x0D			

11.3.13 GET

Functions		Permission	Transparency
Set:	–	-	-
Get:	GET	Administrator	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get file	#GETSP*file_name*CR	
Response			
Multi-line: ~nn@GETSP*file_name*,*file_size*SPREADYCR LF *contents* ~nn@GETSP*file_name*SPOKCR 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			

11.3.14 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

11.3.15 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

11.3.16 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-STEP SP *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			

11.3.17 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-THR SP *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			

11.3.18 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

11.3.19 HELP

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

Response

1. Multi-line: ~nn@Device available protocol 3000 commands:CR LF*command*,SP *command*...CR LF
2. Multi-line: ~nn@HELPSP*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: HELPSPCOMMAND_NAMECR LF

K-Config Example

"#HELP",0x0D

11.3.20 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

11.3.21 LOGOUT

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

11.3.22 MACH-NUM

Functions		Permission	Transparency
Set:	MACH-NUM	End User	Public
Get:		-	-
Description		**Syntax**	
Set:	Set machine number (device ID)	#MACH-NUMSP*machine_number*CR	
Get:	-	-	
Response			
~nn@MACH-NUMSP*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			

11.3.23 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			

11.3.24 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

11.3.25 NAME-RST

Functions		Permission	Transparency
Set:	NAME-RST	Administrator	Public
Get:	-	-	-
Description		**Syntax**	
Set:	Reset machine (DNS) name to factory default	#NAME-RSTCR	
Get:	-	-	
Response			
~nn@NAME-RSTSPOKCR 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			

11.3.26 NET-DHCP

Functions		Permission	Transparency
Set:	NET-DHCP	Administrator	Public
Get:	NET-DHCP?	End User	Public
Description		**Syntax**	
Set:	Set DHCP mode	#NET-DHCPSP*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			

11.3.27 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-GATE SP *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			

11.3.28 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			

11.3.29 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-MACSP*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			

11.3.30 NET-MASK

Functions		Permission	Transparency
Set:	NET-MASK	Administrator	Public
Get:	NET-MASK?	End User	Public
Description		**Syntax**	
Set:	Set subnet mask	#NET-MASKSP*net_mask*CR	
Get:	Get subnet mask	#NET-MASK?CR	
Response			
~nn@NET-MASKSP*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			

11.3.31 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			

11.3.32 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			

11.3.33 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

11.3.34 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: 1-2
RelayState – relay state 0 (open), 1 (close)

Response Triggers

Notes

K-Config Example

Close relay 2:
"#RELAY-STATE 2,1",0x0D

11.3.35 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-VERSP3000:*version*CR LF			
Parameters			
version – XX.XX where X is a decimal digit			
Response Triggers			
Notes			
K-Config Example			
"#PROT-VER?",0x0D			

11.3.36 RESET

Functions		Permission	Transparency
Set:	RESET	Administrator	Public
Get:	-	-	-
Description		**Syntax**	
Set:	Reset device	#RESETCR	
Get:	-	-	
Response			
~nn@RESETSPOKCR 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			

11.3.37 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			

11.3.38 SN

Functions		Permission	Transparency
Set:	-	-	-
Get:	SN?	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get device serial number	#SN? CR	
Response			
~nn@SN SP *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			

11.3.39 TIME

Functions		Permission	Transparency
Set:	TIME	Administrator	Public
Get:	TIME?	End User	Public

Description		Syntax
Set:	Set device time and date	#TIME SP *day_of_week*,*date*,*time* CR
Get:	Get device time and date	#TIME? CR

Response

~nn@TIME SP *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

11.3.40 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

11.3.41 TIME-SRV

Functions		Permission	Transparency
Set:	TIME-SRV	Administrator	Public
Get:	TIME-SRV?	End User	Public
Description		**Syntax**	
Set:	Set time server	#TIME-SRVSP *mode*,*time_server_IP*,*time_server_Sync_Hour*,CR	
Get:	Get time server	#TIME-SRV?CR	

Response

~nn@TIME-SRVSP*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

11.3.42 VERSION

Functions		Permission	Transparency
Set:	-	-	-
Get:	VERSION?	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get firmware version number	#VERSION?CR	

Response

~nn@VERSIONSP*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

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What is Not Covered

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KRAMER

P/N: 2900-300615 Rev: 1

SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing

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

We welcome your questions, comments, and feedback.

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