KRAMER

USER MANUAL

MODEL:

FC-6
Ethernet Control Gateway

FC-6 Quick Start Guide

This guide helps you install and use your **FC-6** for the first time. For more detailed information, go to **http://www.kramerav.com/manual/FC-6** to download the latest manual or scan the QR code on the left.

Step 1: Check what's in the box

☑ **FC-6** Ethernet Control Gateway ☑ 4 Rubber feet ☑ Bracket kit
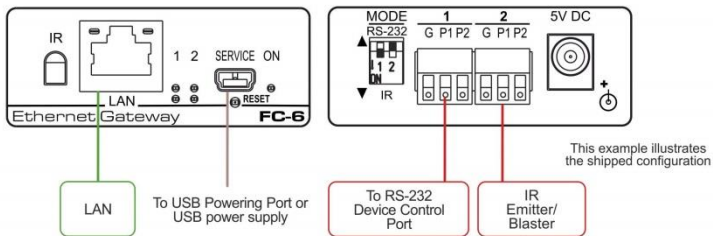
☑ 1 USB A to USB mini cable ☑ 1 Quick start guide

Step 2: Install the FC-6

To mount the **FC-6** in a rack, use an **RK-4PT** rack adapter. Alternatively, attach the rubber feet to the underside of the machine and place it on a table. You can use the TOOL bracket Installation kit (supplied) to mount the **FC-6** on a desktop, wall or similar area. Fasten a bracket on each side of the TOOL using the two M3x8 screws (supplied). Use the flat-head screws (supplied) to fix the TOOL to the mounting surface or enable it to slide in place.

Step 3: Connect inputs and outputs

Always switch OFF the power on each device before connecting it to your **FC-6**.
For best results, we recommend that you always use Kramer high-performance cables to connect AV equipment to the **FC-6**.

This example illustrates the shipped configuration

LAN

To USB Powering Port or USB power supply

To RS-232 Device Control Port

IR Emitter/ Blaster

Step 4: Connect the power

Connect a USB cable from a USB powering port or a USB power supply or an optional 5V power supply to the **FC-6**.

Step 5: Set the DIP-switches

For each port, set the respective DIP-switch up (off) for RS-232 and down (on) for IR.

Default settings are Port 1 = RS-232 (up), Port 2 = IR (down)

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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-6** *Ethernet Control* Gateway that is ideal for use with RS-232/IR interfaces over an Ethernet network.

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-6 to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

2.1 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)

- Do not secure the cables in tight bundles or roll the slack into tight coils

- Avoid interference from neighbouring electrical appliances that may adversely influence signal quality

- Position your **FC-6** 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 *http://www.kramerav.com/support/recycling/*.

3   Overview

The **FC-6** is high-performance, easy-to-use, multi-function bidirectional hardware and software interface system for controlling RS-232 and IR-controllable devices via an Ethernet LAN.

This multi-function Ethernet to serial/IR gateway bridges the gap between Ethernet infrastructures and serial or IR communication devices by offering bidirectional Ethernet to serial and IR conversion. All setup and maintenance of the devices is done from built-in Web pages that are accessible using any common Web browser.

The **FC-6** can receive IP-based commands from IP-connected clients, for each multi-function serial and IR port, and convert them into serial/IR signals on the requested serial/IR port. Responses are sent back to all IP-connected clients.

The **FC-6** features:

- Compact, piggy-back installation with the controlled device (such as behind a TV or display) with the ability to draw power over USB, typically from the device

- Two dual-function ports each with either, one selectable bidirectional RS-232 or two IR outputs

- Up to 40 IP connected clients over customer Ethernet network, remotely controlling devices connected to control gateway RS-232 and IR ports

- Remote IP-based control of up to two RS-232-controlled devices connected to the control gateway

- Remote IP-based control of up to four IR-controlled devices connected to the control gateway

- Easy plug-and-play IP installation with dynamic (DHCP) address resolution and auto device discovery over customer LAN

- Device remote management, via web browser, by multiple IP-clients (PCs or remote controllers) over customer LAN

- Browser-based IR learning tool for IR sensor detected signals

- Windows®-based Virtual Port software for setting up virtual ports on a PC

- USB port for powering the device or upgrading firmware locally

- Remote firmware upgrades via a LAN

- Optional power supply (not included)

- A compact, Kramer PicoTOOLS™ enclosure that can be mounted side by side in a 19-inch rack using a **RK-PT4** rack adapter
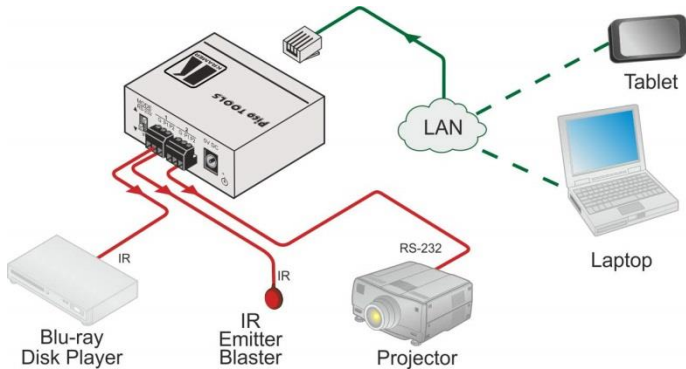
Figure 1: FC-6 Controlled Devices from Remote IP-based Clients

Using control software, such as Kramer K-Touch and K-Config software, you can design advanced room-control and automation systems that can be operated from Windows laptop, iOS or Android touch devices. Control software can perform device discovery over the Ethernet network when the **FC-6** is set to be a DHCP client for dynamic IP address resolution.

You can use the Kramer **LAN Configurator** software to discover devices that are attached to the network, including the **FC-6**.

The **FC-6** includes the Virtual Serial Port Manager (Kramer VSPM) for compatibility with applications based on COM-port communication. Virtual Serial Port Manager:

- Makes the **FC-6** compatible with all Windows®-based applications that require a physical COM port. This includes all versions of **K-Router** and other Kramer control applications. It lets you operate all RS-232 controllable devices via an Ethernet LAN using their existing PC software

- Allows virtual serial ports to operate like physical COM ports, that is, logical COM ports that behave exactly like a standard hardware COM port. In reality, it transparently reroutes the data using the TCP/IP network to the **FC-6** interface via a virtual connection that you can emulate over the Ethernet or Internet

- Allows the creation of any number of serial ports on your PC that do not occupy any physical serial ports

3.1 Defining the FC-6 Ethernet Control Gateway

This section defines the **FC-6**.
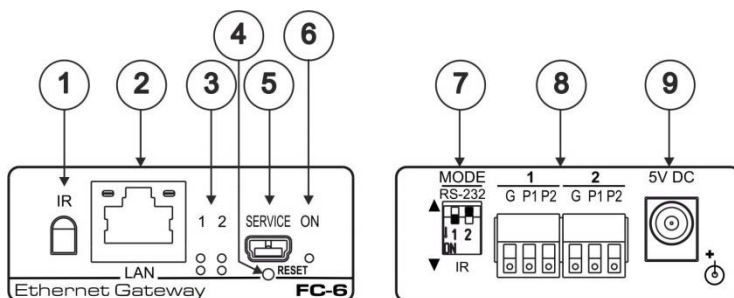
Figure 2: FC-6 Ethernet Control Gateway

#	Feature	Function
1	*IR* Sensor	Sensor for IR learning
2	*LAN* RJ-45 Connector	Connect to a IP client PC or other controller directly or via a LAN (see Section 5.1)
3	Port 1 and 2 white (upper) and blue LEDs	Show the transmission status of port 1 and port 2: When set as RS-232, the white LED indicates Tx and blue LED indicates Rx When set as IR, the white LED indicates IR_{P1} Tx and blue LED IR_{P2} indicates Tx
4	*RESET* Button	Press and hold while cycling the device power to reset to factory default parameters, (see Section 9)
5	*SERVICE* Mini USB Connector	Connects to a PC to supply power to the device or perform a local firmware upgrade
6	*ON* LED	Lights green when the unit is on
7	*MODE* DIP-switches (Port 1 and Port 2)	Switch up for RS-232, switch down for IR (the default setting is port 1 RS-232 (up) and port 2 IR (down))
8	Port 1 and 2 I/O 3-pin Terminal Block	Each terminal block connects one bidirectional RS-232 port or two IR outputs
9	*5V DC* Connector	Connect to the optional 5V DC power supply, center pin positive. Not needed when the device is supplied power by the USB connection

4 Initial Configuration and Use Overview

This chapter provides an overview of the initial configuration and basic operation of the **FC-6** and comprises:

- Configuring the **FC-6** (see <u>Section 4.1</u>)

- Configuring a virtual port on the PC (see <u>Section 4.2</u>)

- Configuring an Ethernet connection on the PC (see <u>Section 4.3</u>)
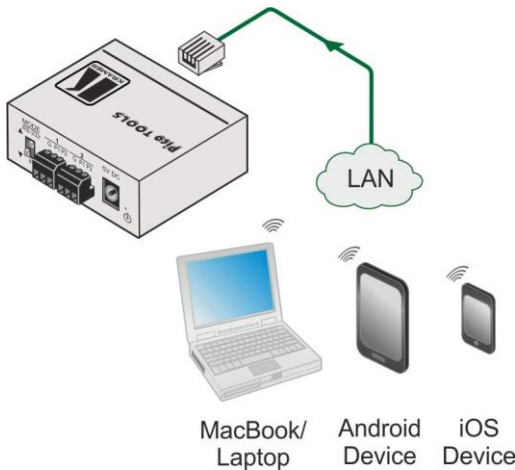
Figure 3: Connecting the FC-6 for Initial Configuration

4.1 Configuring the FC-6 Ethernet Control Gateway

Note: The **FC-6** is shipped from the factory with DHCP enabled (off by default) and a random IP address. To connect the **FC-6** on first installation, you must identify what IP address has been automatically assigned to the **FC-6**. To discover the IP address of
FC-6, use **K-LAN Configurator**, available for download from our website at <u>http://www.kramerav.com</u>.

To browse the FC-6 Web pages on taking the device out of the box:

Use the default host name: **FC-6-xxxx**, where xxxx are the last four digits of the serial number of the device**.**

To configure the FC-6:

1. Connect the Ethernet port on the rear panel of **FC-6** to a PC, either directly or via a LAN, (see Section 5.1).

2. Using a Web browser and the relevant IP address, browse the General Info home page (see Figure 10).

3. Click on **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 on **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 suggest a meaningful host name.
   Note: If you have changed the IP from the default setting, you must reload the General Info home page again using the new IP address.

8. Click on **Serial Ports Settings** to browse to the Serial Port Settings page, (see Figure 14).

9. Associate the required serial ports with their corresponding TCP/UDP settings.

10. For each associated serial port, enter the serial port configuration parameters using the drop-down lists under Serial Configuration.

11. Click **Save Changes**.

12. If required, click on **Security** to browse to the Security page.

13. Click **ON** to activate security.
    The user name and password credentials popup appears.

14. Enter the required user name and password. (The default user name is **Admin** and the password is **Admin**).

4.2 Configuring a Virtual Port on the PC

If the control application cannot work with an Ethernet driver, download the Kramer VSPM from our Web site to set a virtual port for each local port on your **FC-6**.

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

4.3 Setting Up an Ethernet Connection on the PC

If the control application can directly connect to the Ethernet driver, select the host IP and port number according to your **FC-6** configuration, as illustrated in Figure 4.
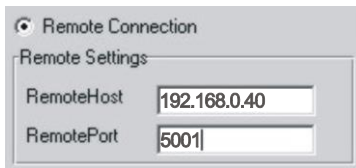
Figure 4: Configuring a Remote Connection

5 Connecting the FC-6

> Always switch off the power to each device before connecting it to your **FC-6**. After connecting your **FC-6**, connect its power and then switch on the power to each device.
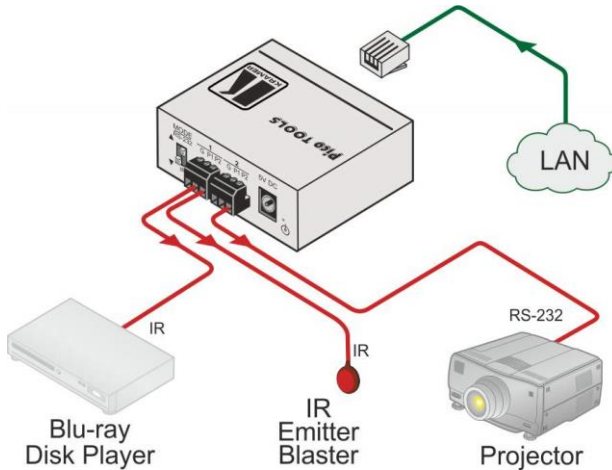
Figure 5: Connecting the FC-6 Ethernet Control Gateway

To connect the FC-6 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 down to select IR. Connect an IR emitter (for example, to control a Blu-ray disk player) to TB1 P1 and connect an emitter/blaster to TB 1 P2.

3. Set DIP-switch 2 up to select RS-232. Connect an RS-232 cable (for example, to the control port of a projector) to the 3-pin, RS-232 terminal block 2.

4. Connect the device to a USB power port or to a USB power adapter or to an optional 5V DC power adapter and connect the power adapter to the mains electricity (not shown in Figure 5).

Note: You can connect up to four IR devices or up to two RS-232 devices if both ports are used for each setting.

5.1 Connecting via Ethernet

You can connect to the **FC-6** via Ethernet using either of the following methods:

- Directly to the PC using a crossover cable (see <u>Section 5.1.1</u>)

- Via a network hub, switch, or router, using a straight-through cable (see <u>Section 5.1.2</u>)

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.

5.1.1 Connecting the Ethernet Port Directly to a PC

You can connect the Ethernet port of the **FC-6** 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-6** with the factory configured default IP address.

After connecting the 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 <u>Figure 6</u>.
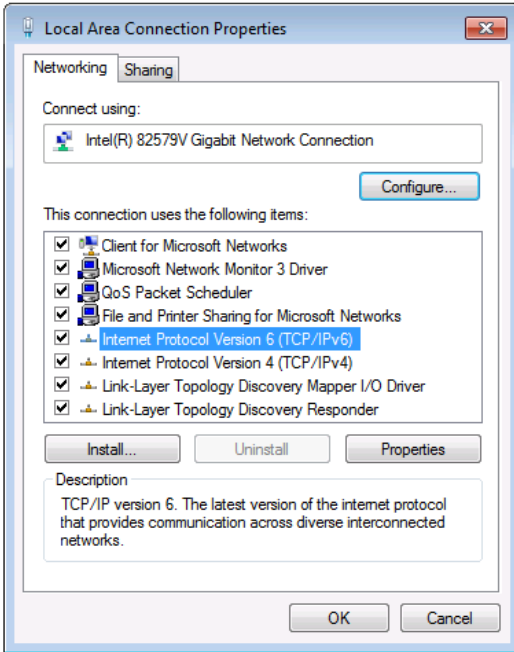
Figure 6: Local Area Connection Properties Window

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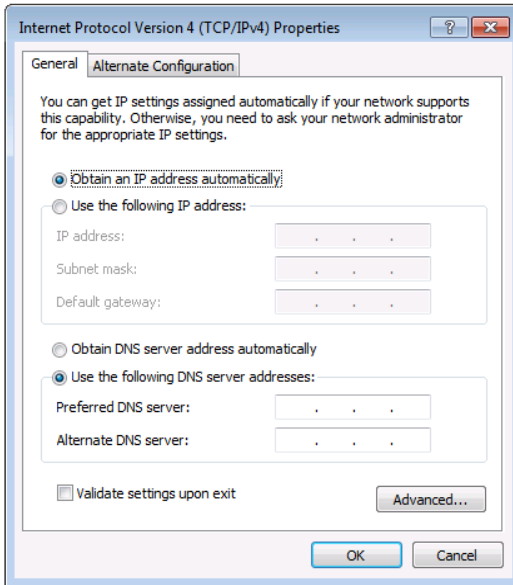
Figure 7: Internet Protocol Version 4 Properties Window
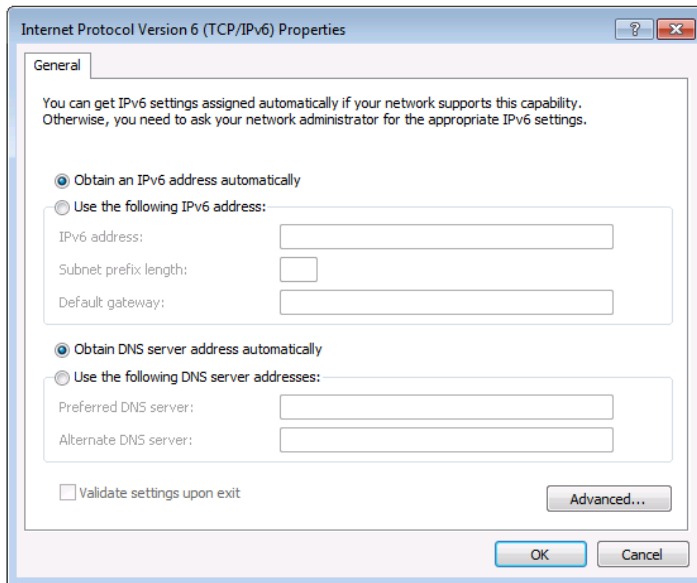
Figure 8: Internet Protocol Version 6 Properties Window

5. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in Figure 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.
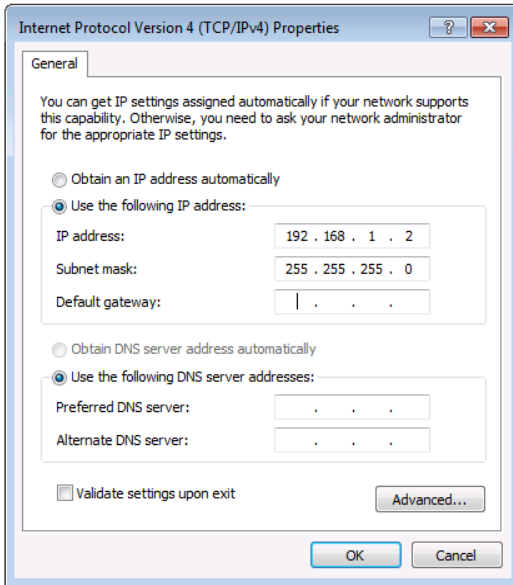
Figure 9: Internet Protocol Properties Window

6. Click **OK**.

7. Click **Close**.

5.1.2   Connecting the Ethernet Port via a Network Hub or Switch

You can connect the Ethernet port of the **FC-6** to the Ethernet port on a network hub or using a straight-through cable with RJ-45 connectors.

5.1.3 Connecting to the FC-6 via RS-232 or IR

To connect to the FC-6 via RS-232:

- Connect the RS-232, 3-pin, terminal block connectors on the rear panel of the **FC-6** using 3-wire cable (pin TX to pin 2, RX to pin 3, and G to pin 5) to the RS-232 9-pin D-sub port on the devices to be controlled

To connect to the FC-6 via IR either:

- Connect an IR blaster to one of the IR Outputs and place it within 4m to 8m (13 to 26ft) and in line-of-sight of the device to be controlled

  —OR—

- Connect an IR emitter cable to one of the IR Outputs and stick the emitter to the IR sensor on the device to be controlled

6 Remote Operation via the Web Pages

The embedded Web pages can be used to remotely operate the **FC-6** using a Web browser and an Ethernet connection.

Before attempting to connect:

- Perform the procedures in Section 4.1 and in Section 5.1

- Ensure that your browser is supported (see Section 8)

To browse the Web pages:

1. Open your Internet browser. Type the IP address of the device (see Section 4.1) in the Address bar of your browser.

A loading page appears followed shortly by the General Info page shown in Figure 10.

6.1 General Info Page

The General Info page displays the following:

- Model Name

- Firmware version

- Device serial number

- Web page version

At the bottom left hand side of all pages there are Load/Save Configuration buttons. These allow you to save the current configuration and load any pre-saved configurations.
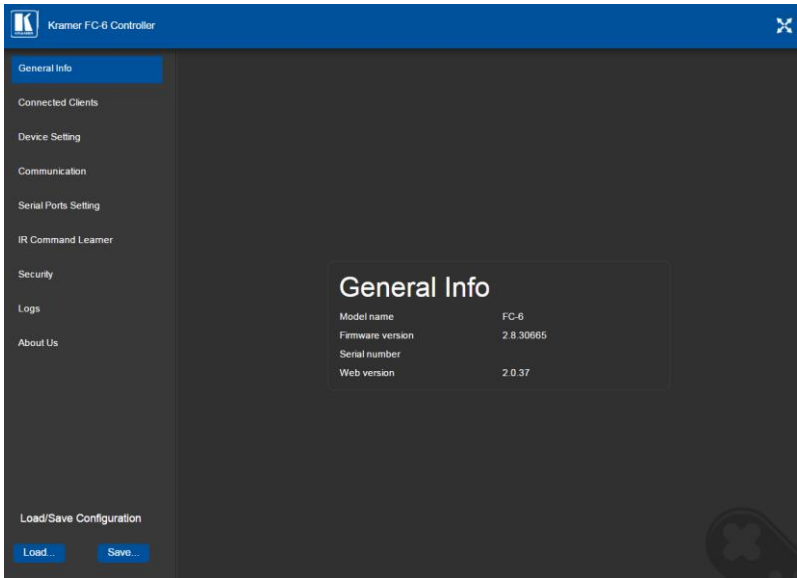
Figure 10: General Info Page

Loading and Saving Configurations

Loading and saving configurations using the buttons at the bottom left-hand side of the screen irrespective of which page is 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 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.

6.2 Connected Clients Page

The Connected Clients page allows you to view the following details of any client devices connected via Ethernet to the **FC-6**:

- IP address
- The port it is connected to
- Method of connection
- Whether or not Send Replies is enabled for the port
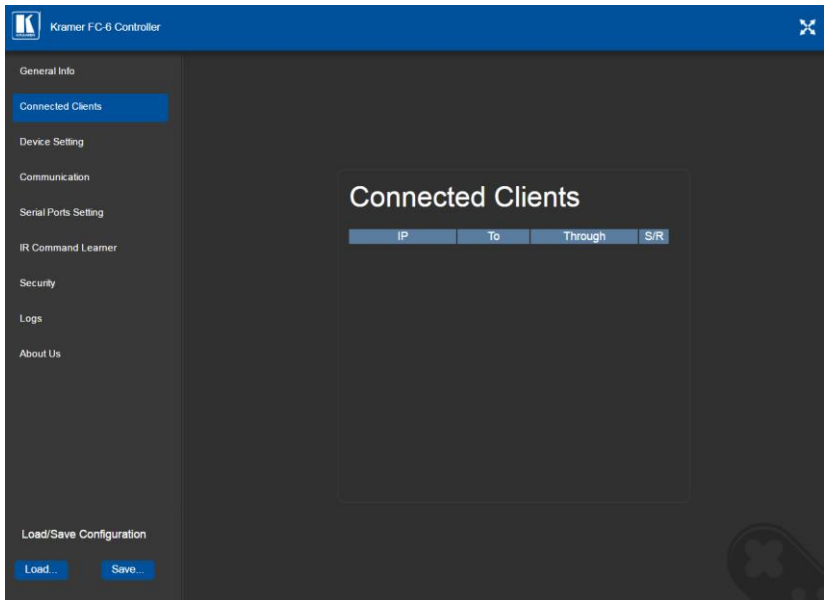
Figure 11: Connected Clients Page

6.3 Device Settings Page

The Device Settings page 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
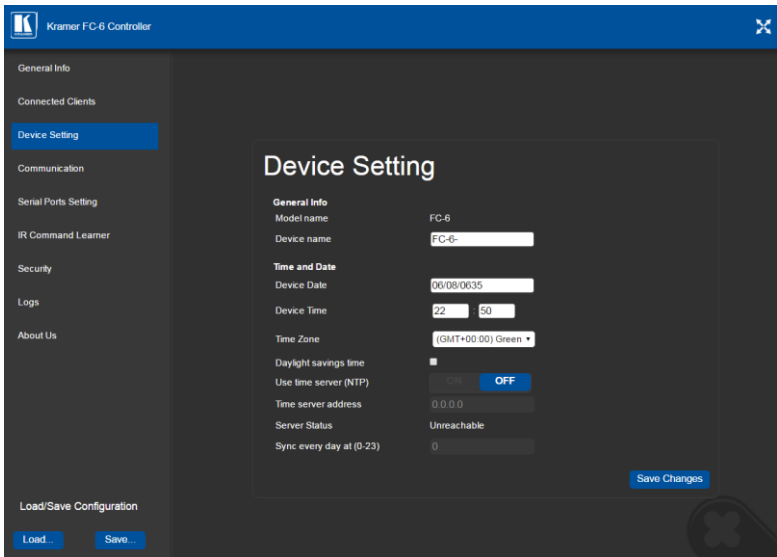
Figure 12: Device Settings Page

The **FC-6** 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 .

2. Click the Use Time Server **ON** button.

3. Enter the IP address of the Time Server.

4. Enter the time of day **FC-6** synchronizes with the Time Server.

5. Click **Save Changes**.

6.4   Communication Page

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.
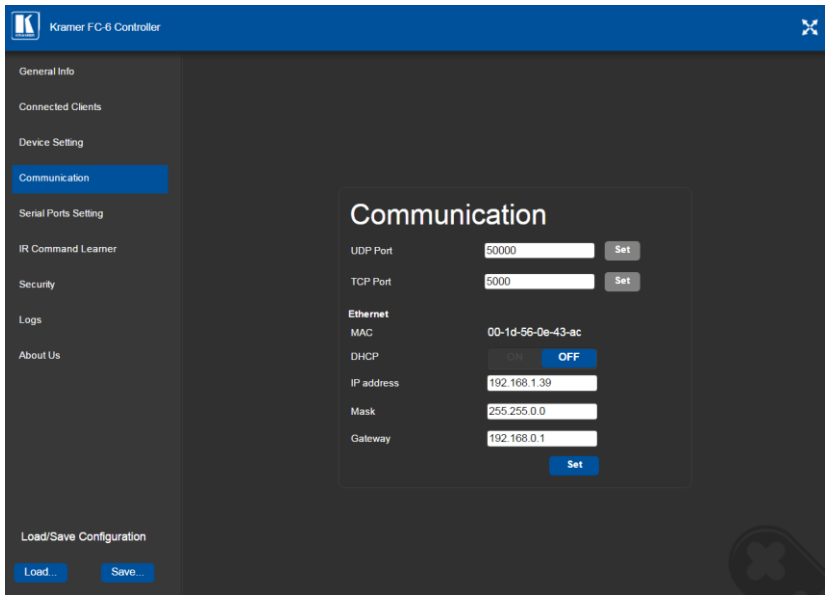
Figure 13: Communication Page

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

6.5 Serial Port Settings Page

The Serial Port Settings page allows you to:

- Set the following Ethernet parameters for each Ethernet port:

    - Select TCP or UDP

    - IP port label

    - TCP keep-alive time

    - TCP keep alive time – 0-3600sec (default 60sec) internal time, after which detected idle connection is disconnected

- Set the following serial parameters for each serial port:

    - Parity

    - Data bits

    - Baud rate

    - Stop bits

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

Figure 14: Serial Port Settings Page

6.6 IR Command Learner Page

The IR Command Learner page allows you to teach the **FC-6** IR commands. These can be saved for later use.

Note: While learning is in progress, the four IR Out LEDS light and the **FC-6** is not available for normal operation.
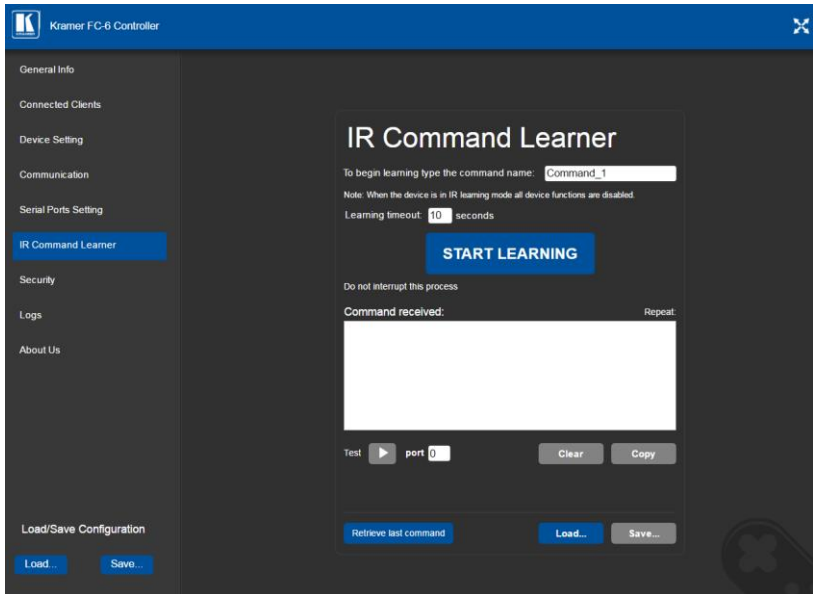
Figure 15: IR Command Learner Page

Feature	Function
Command Name Field	Enter the required name for the command
Learning Timeout	Set the time to elapse before the learning mode is exited if no command is received
Start Learning Button	Press to start the learning process. **Note**: While learning is in progress, the four IR Out LEDS light and the **FC-6** is not available for normal operation.
Command Received Window	Displays the command string received during the process. This command can be copied/pasted to another application
Test Button and Port Selection Spinner	Select the port on which to test the learned command and press the Test button to start the test
Retrieve Last Command Button	Press to retrieve that last command learned
Load/Save Buttons	Press Load to retrieve a previously saved command. Press Save to save the current command

6.7 Security Page

The Security page allows you to turn logon authentication on or off.
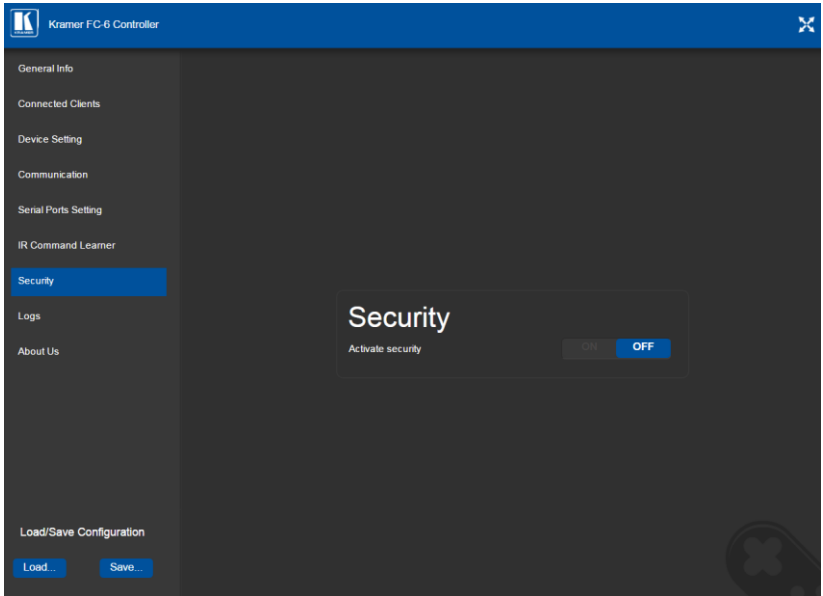
Figure 16: Security Page

When security is on, access to the Web pages 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 page security:

1. On the Security page, click **ON**.
    The confirmation popup is displayed as shown in .
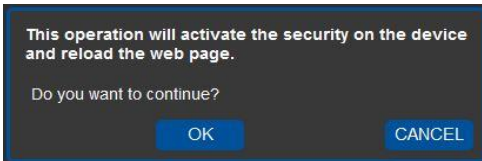
Figure 17: Security Confirmation Popup

2. Click **OK**.
    The Authentication Required popup is displayed as shown in .
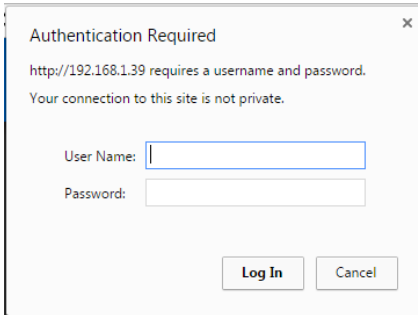
Figure 18: Authentication Required Popup

3. Enter the default username and password.

4. Click **OK**.

5. Wait until the Web pages have reloaded. Click the Security page button. The page show in Figure 19 is displayed.
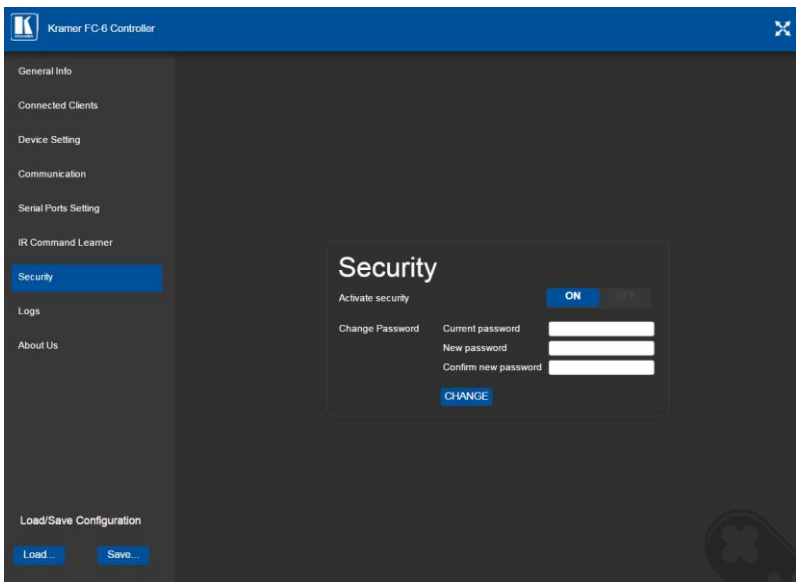
Figure 19: Security Activated Page

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

6.8 Logs Page

The Logs page allows you to:

- View current logs

- Configure the logs

- Filter the logs
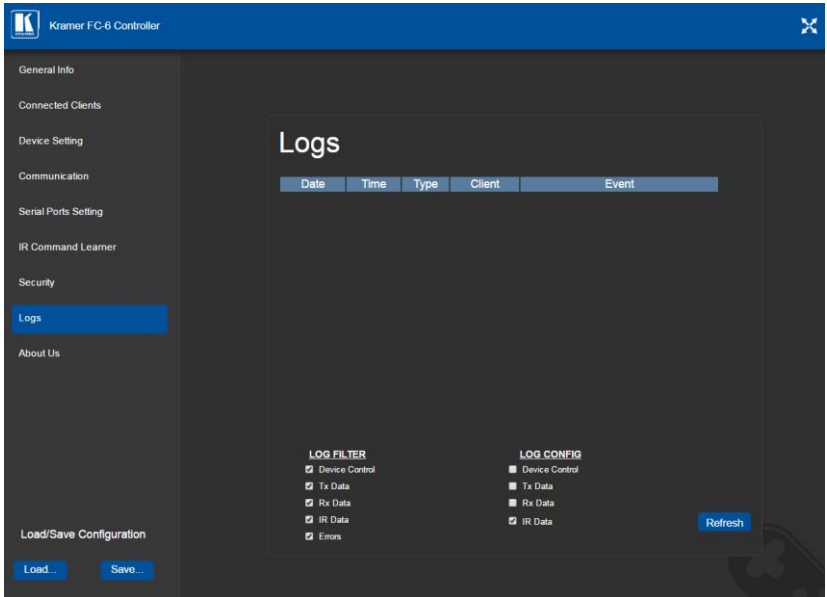
Figure 20: Logs Page

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.

6.9 About Us Page

The About Us page displays the Web page version and the Kramer company details.
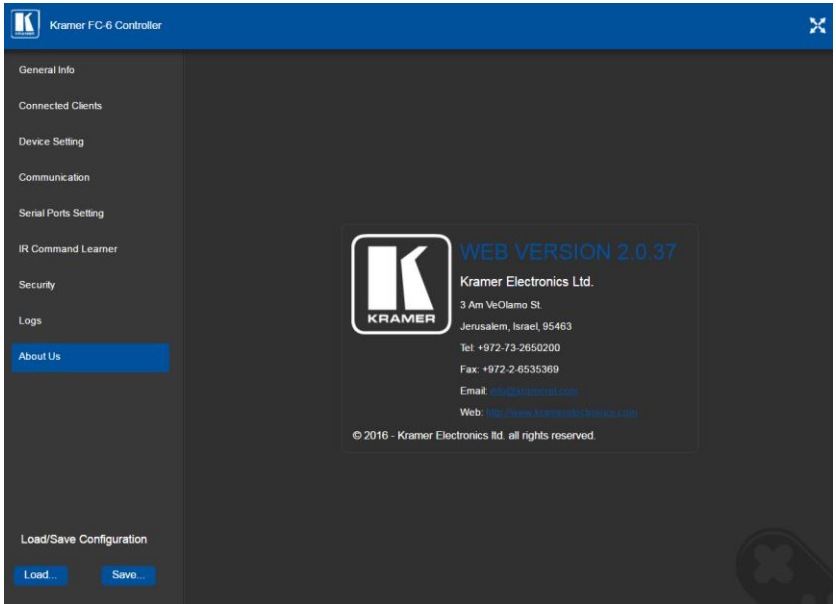
Figure 21: About Us Page

7 Configuring and Maintaining the FC-6

7.1 IR Learning

Note: While learning is in progress, the **FC-6** is not available for normal operation.

At the start and end of learning a message is sent to all attached clients.

To perform IR learning, the IR remote control must be approximately five to seven centimeters (2" and 2.7") from the **FC-6** front panel.

To teach the FC-6 an IR command:

1. Put the **FC-6** in IR Learning mode either by sending the P3000 command, (see Section 10.2) or by using the Web pages, (see Section 6.6).
   The device is no longer in normal operation, and the **FC-6** sends an IR Learning start message to all connected clients.

2. Using the IR remote control, send the required command to the **FC-6**.
   The **FC-6** processes the IR detected signal and generates the signal-associated pronto code to be used by the driver. When using the Web page for IR learning, the **FC-6** also displays the learned command code on screen. (This command can be copied/pasted to other applications, for example, control software when creating a driver.) The **FC-6** then sends the IR Learning stop message to all connected clients to indicate return to normal operation.

3. Optional—Test the command if using the IR Learning Web page.
   Test results are displayed on screen.

4. Save the learned command.

7.2 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.

7.3 Upgrading the Firmware

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

8 Technical Specifications

PORTS:	2 RS-232 bidirectional serial or 4 IR (selectable) on 3-pin terminal blocks 1 LAN on an RJ-45 connector 1 IR sensor for IR learning 1 mini USB connector for programming
SUPPORTED SERIAL PORT BAUD RATES:	1200, 2400, 4800, 9600, 19200, 38400, 57600, 15200bps
RS-232 COMMUNICATION:	Transparent up to 115200bps
IR EMITTER CABLE RANGE:	80m (260ft)
SUPPORTED IR OUTPUT FREQUENCIES:	20kHz to 1.2MHz
SUPPORTED IR INPUT FREQUENCIES:	20kHz to 60kHz
MAXIMUM DATA HANDLING OF DEVICE:	Up to 150kbps (summed on all ports, see Section 8.1)
MAXIMUM SIMULTANEOUS IP-CLIENT CONNECTIONS:	40
SUPPORTED WEB BROWSERS:	Windows 7 and higher: • Internet Explorer (32/64 bit) version 11 • Firefox version 30 • Chrome version 35 MAC: • Chrome version 35 • Firefox version 27 • Safari version 7 Android OS: • Chrome version 35 iOS: • Chrome version 35 • Safari version 7
POWER CONSUMPTION:	5V DC, 300mA
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
COOLING:	Convection
ENCLOSURE TYPE:	Aluminum
RACK MOUNT:	With optional rack adapter
DIMENSIONS:	6.22cm x 2.44cm x 5.18cm (2.45"x 0.96" x "2.04") W, D, H
PRODUCT WEIGHT:	84g (3.0ozs) approx.
SHIPPING DIMENSIONS:	15.7cm x 12cm x 8.7cm (6.2" x 4.7" x 3.4") W, D, H
SHIPPING WEIGHT:	0.43kg (0.94lbs) approx.
VIBRATION:	ISTA 1A in carton (International Safe Transit Association)
SAFETY REGULATORY COMPLIANCE:	CE
ENVIRONMENTAL REGULATORY COMPLIANCE:	Complies with appropriate requirements of RoHs and WEEE

INCLUDED ACCESSORIES:	3ft USB cable
OPTIONS:	5V DC Power adapter, 19" rack adapter RK-4PT, IR Cables—C-A35M/2IRE-10, C-A35M/IRR-3, C-AS35M/AS35F-50, CA35M/IRE-10 Bulk cable for serial control—BC-1T-300M

Specifications are subject to change without notice at http://www.kramerelectronics.com

8.1 Data Handling Performance

The **FC-6** is designed to support mainly AV-relevant RS-232 communication.

These devices must have overall data bandwidth limits high enough in most AV installations to support the required communication bandwidth.

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

The total sustained data bandwidth that each device can handle for all ports simultaneously is 150kbps.

8.2 Example Bandwidth Calculation

The **FC-6** has two serial ports. Each serial port can support up to:

- 150kbps / 2 = 75kbps

If each protocol command is 100 bytes, (that is, 800 bits), you can safely send and receive a minimum of 96 commands per second on each serial port. This is shown using the following calculation:

(150kbps * 1024) / 800 bits / 2 = 96

The same calculation applies to all devices. A similar calculation applies when fewer ports are used at the same time where a higher bandwidth per port can be achieved.

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

9   Default Communication Parameters

RS-232	
Protocol 3000	
Baud Rate:	115200
Data Bits:	8
Stop Bits:	1
Parity:	None

Note: The **FC-6** is shipped from the factory with DHCP enabled (off) 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-6-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
TCP Device Port:	5000
TCP Serial Port 1:	5001
TCP Serial Port 2:	5002
UDP Device Port:	50000

Default Logon Authentication

Web Page Access	
User name:	Admin
Password:	Admin

10 Kramer Protocol 3000

The **FC-6** can be operated using serial commands from a PC, remote controller or touch screen using the Kramer Protocol 3000.

This section describes:

- Kramer Protocol 3000 syntax (see)

- Kramer Protocol 3000 commands (see)

10.1 Kramer Protocol 3000 – Syntax

10.1.1 Host Message Format

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

10.1.1.1 Simple Command

Command string with only one command without addressing:

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

10.1.1.2 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

10.1.2 Device Message Format

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

10.1.2.1 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)

10.1.3 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.

10.1.4 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 $\boxed{\text{CR}}$ press the Enter key. ($\boxed{\text{LF}}$ 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.

10.1.5 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.

10.1.6 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.

10.1.7 Maximum String Length

64 characters

10.2 Kramer Protocol 3000 – Command List

Command	Description
#	Protocol handshaking
BUILD-DATE?	Read device build date
DEL	Deletes a file
DIR	List files
ETH-PORT	Sets protocol port
FACTORY	Restart the machine with the default
FORMAT	Format the file system
FS-FREE?	Print free file space
GET	Get file content
HELP	List of commands
IR-LEARN	Send IR learning command
IR-SND	Send IR command to port
IR-STOP	Stop IR command to port
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
PROT-VER?	Get protocol version
RESET	Reset device
SECUR	Set/get current security state
SN?	Get device serial number
TIME	Set/get the time
TIME-LOC	Set/get local time offset from UTC/GMT
TIME-SRV	Set/get time synchronization from server
UART	Set/get a port serial parameters
VERSION?	Get firmware version number

10.3 Kramer Protocol 3000 – Detailed Commands

This section lists the detailed commands applicable to the **FC-6**.

10.3.1

Functions		Permission	Transparency
Set:	**#**	End User	Public
Get:	**-**	-	-
Description		**Syntax**	
Set:	Protocol handshaking	#CR	
Get:	-	-	
Response			
~nn@SP**OK**CR 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			

10.3.2 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			

10.3.3 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			

10.3.4 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_io* 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			

10.3.5 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 - TCP/UDP *ETHPort* - TCP/UDP port number			
Response Triggers			
K-Config Example			
Set ETH port 1 to UDP. "ETH-PORT UDP,1",0x0D			

10.3.6 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**SPOKCR 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			

10.3.7   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			

10.3.8   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			

10.3.9 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

10.3.10 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

10.3.11 IR-LEARN

Functions		Permission	Transparency
Set:	`IR-LEARN`	End User	Public
Get:	-	-	-
Description		**Syntax**	
Set:	Send IR learning command	`#IR-LEARN`SP`CommandName,Timeout`CR
Get:	-	-	
Response			
~nn@IR-LEARNSP`CommandName,IR_Status`CR LF			
Parameters			
`CommandName` – String: IR command name limited to 15 chars. Controlling device must send the correct name (whitespace or commas forbidden) `Timeout` - Timeout in seconds (1 to 60) `IR_Status` - (see Section 10.4.4)			
Response Triggers			
K-Config Example			
Send the IR learning command volume up with a 3 second timeout. "#IR-LEARN vol_up,3",0x0D			

10.3.12 IR-SND

Functions		Permission	Transparency
Set:	`IR-SND`	End User	Public
Get:	**-**	-	-

Description		Syntax
Set:	Send IR command to port	`#IR-SND`SP`PortNum,Cmdid,CmdName,Repeat,` `TotalPackages,PackageNum,<pronto command…>`CR
Get:	-	-

Response

~nn@**IR-SND**SP*PortNum,Cmdid,CmdName,Status*CR LF

Parameters

Port Num – IR port (1 to 4) transmitting the command. '*' broadcasts to all ports
Cmd_id – serial number of command for flow control and response commands from device
CmdName – command name (length limit 15 chars)
Repeat – number of times the IR command is transmitted (limited to 50; repeats > 50 are truncated to 50), default = 1
Total packages – number of messages the original command was divided into, default = 1
Package_num – chunk serial number (only valid when Chnk_Num >1)
Pronto command – Pronto format command (in HEX format, no leading zeros, no '0x' prefix)
Status – 0=no error (see [Section 10.4.3](#))

Response Triggers

K-Config Example

Send a volume up command to port 3 and repeat five times.
`"#IR-SND 3,04,vol_up,5,1,1,4E 23 C4…",0x0D`

10.3.13 IR-STOP

Functions		Permission	Transparency
Set:	`IR-STOP`	End User	Public
Get:	**-**	-	-
Description		**Syntax**	
Set:	Send IR stop command to port	`#IR-STOP`SP`PortNum,Cmdid,CmdName`CR	
Get:	-	-	
Response			
~nn@**IR-STOP**SP`PortNum,Cmdid,CmdName,Status`CR LF			
Parameters			
Port_Num – IR port (1 to 4) transmitting the command. '*' broadcasts to all ports *Cmd_id* – serial number of command for flow control and response commands from device *CommandName* – a string, the alias of the IR command. The controlling device is responsible for sending the correct name *Status* – 0=no error (see Section 10.4.4)			
Response Triggers			
K-Config Example			
Send a power off command to IR port 2 "#IR-STOP 2,06,power_off",0x0D			

10.3.14 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**SPERRSP004CR 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

10.3.15 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			

10.3.16 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			

10.3.17 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-6-4321: "#NAME 4321",0x0D

10.3.18 NAME-RST

Command Name		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			

10.3.19 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-DHCP**`SP`*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			

10.3.20 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			

10.3.21 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			

10.3.22 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			

10.3.23 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			

10.3.24 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			

10.3.25 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**SP3000:*version*CR LF			
Parameters			
version - XX.XX where X is a decimal digit			
Response Triggers			
Notes			
K-Config Example			
"#PROT-VER?",0x0D			

10.3.26 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			

10.3.27 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			

10.3.28 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

10.3.29 TIME

Command Name		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

10.3.30 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			

10.3.31 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 FC-6 to a time server at a given IP address, activate and sync at 6AM
"#TIME-SRV 1,xxx.xxx.xxx.xxx,06",0x0D

10.3.32 UART

Command Name		Permission	Transparency
Set:	**UART**	Administrator	Public
Get:	**UART?**	End User	Public

Description		Syntax
Set:	Set com port configuration	#**UART**SP*COM_Num,baud_rate,data_bit,parity,* *stop_bit*CR
Get:	Get com port configuration	#**UART?**SP*COM_Num*CR

Response
Set: ~nn@**UART**SP*COM_Num,baud_rate,data_bit,parity,stop_bit*CR LF **Get:** ~nn@**UART**SP*COM_Num,baud_rate,data_bit,parity,stop_bit,serial1_type,485_term*CR LF

Parameters
COM_Num - 1–2 *baud_rate* - 9600 – 115200 *data_bit* - 7–8 *parity* - N (none), O (odd), E (even), M (mark), S (space) *stop_bit* - 1–2 *serial1_type* - 0 (RS-232), 1 (RS-485) *485_term* - 1/0 (optional - this exists exist only when serial1_type = 485)

Response Triggers

Notes
In FC-6 the serial port is selectable to RS-232 or RS-485 (usually serial port 1). If Serial1 is configured when RS-485 is selected, the RS-485 UART port is automatically changed

K-Config Example
Configure RS-232 com port 1 to 9600 baud, 8 data bits, no parity, 1 stop bit "#UART 1,9600,8,N,1,0"0x0D

10.3.33 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				

10.4 Parameters

10.4.1 Parity Types

Number	Value
0	No
1	Odd
2	Even
3	Mark
4	Space

10.4.2 Serial Types

Number	Value
0	232
1	485

10.4.3 IR Transmit Status

Number	Value
0	IR_SENT
1	IR_STOP
2	IR_BUSY
3	IR_WRONG_PARAM
4	IR-NOTHING_TO_STOP

10.4.4 IR Status

Number	Value
0	Sent
1	Stop
2	Done
3	Busy
4	Wrong Parameter
5	Nothing to Stop
6	Start
7	Timeout
8	Error

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

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