KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

FC-26

Ethernet Controller

P/N: 2900-300463 Rev 1

FC-26 Ethernet Controller Quick Start Guide

This guide helps you install and use your product for the first time. For more detailed information, go to http://bit.ly/k-prod-downloads to download the latest manual or scan the QR code on the left.

Step 1: Check what's in the box

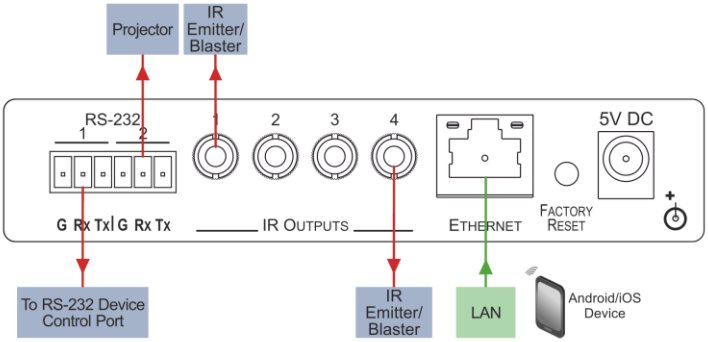
- ☑ **FC-26** Ethernet Controller
- ☑ 1 Power adapter (5V DC)
- ☑ 1 Quick Start Guide
- ☑ 4 Rubber feet

Step 2: Install the FC-26

Mount the device in a rack (using the optional rack adapter **RK-3T** available for purchase) or attach the rubber feet and place the device on a shelf.

Step 3: Connect the inputs and outputs

Always switch off the power to all devices before connecting them to your **FC-26.**



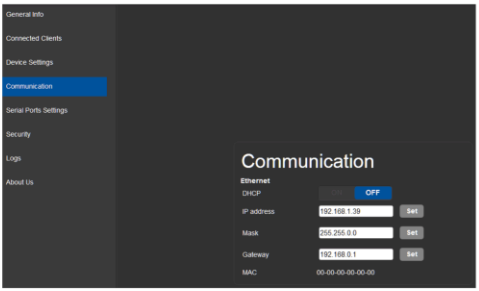
Always use Kramer high-performance cables for connecting equipment to the **FC-26.**

Step 4: Connect the power

If the device does not receive power via PoE, connect the power adapter to the **FC-26** and plug the power adapter it into the mains electricity.

Step 5: Configure and Operate the FC-26

1. Using the embedded Web pages, configure the Ethernet controller:
   - Set DHCP or assign a static IP address
   - Associate IP port(s) with serial port(s)
   - Configure the serial port parameters
2. Configure virtual port(s) on the K-Touch control device/PC.
3. Configure Ethernet connection(s) on the K-Touch control device/PC.
4. Switch port(s) on the Ethernet Controller.



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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 13 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-26** *Ethernet Controller* that is ideal for use with Ethernet/RS-232 interfaces.

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
- Use Kramer high performance high resolution cables

Go to http://www.kramerelectronics.com/support/product_downloads.asp to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

2.1 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)Do not secure the cables in tight bundles or roll the slack into tight coils
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer **FC-26**, and 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 input power wall adapter 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.kramerelectronics.com/support/recycling/*.

3 Overview

The **FC-26** is high-performance, easy-to-use, bidirectional hardware and software interface system for controlling RS-232 and IR-controllable devices via an Ethernet LAN.

These Ethernet to serial controllers bridge the gap between Ethernet infrastructures and serial 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 which are accessible using any common Web browser.

The **FC-26** can receive **K-Touch** 3.1 Ethernet-based per IR port or per serial port commands and converts them into IR/serial signals on the requested IR/serial port. Responses are sent back to all Ethernet connected panels.

In particular, the **FC-26**:

- Offers network connectivity that lets you connect a Kramer (or other) device via its RS-232 port to an Ethernet LAN
- Works in conjunction with **K-Touch 3** for remote control of devices over an Ethernet LAN via IR or serial connections, (see Figure 1)
- Allows you to control up to two RS-232 devices via Ethernet from a PC, tablet, smartphone, and so on
- Allows you to control a device from multiple Ethernet points (PCs or remote controllers), via a LAN or the Internet
- Provides IR ports for device control via IR blasters/emitters
- Includes Windows®-based Virtual Port software for setting up virtual ports on a PC
- Supports static or dynamic (DHCP) IP addressing
- Can act as a PoE receiver
- Has a USB port for upgrading the firmware
- Supports remote firmware upgrades via a LAN

- Is housed in a compact, Kramer TOOLS™ enclosure which can be mounted side by side in a 19-inch rack using suitable rack adapters

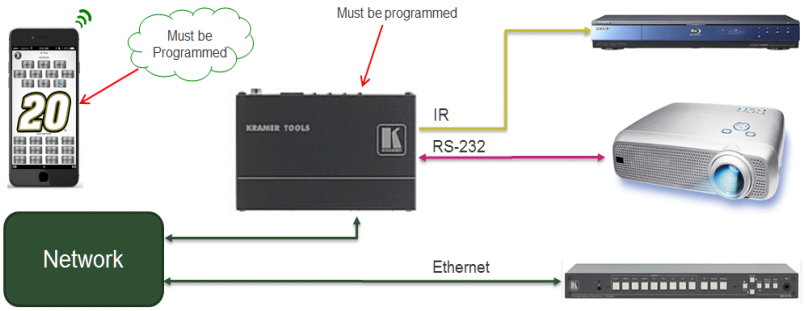

Figure 1: FC-26 Controlling Devices Remotely Using K-Touch 3.0 over a LAN

Using **K-Touch 3.0** you can design advanced room-control and automation systems that can be operated from iOS or Android touch devices. **K-Touch 3.0** can be used to perform device discovery over the network as the **FC-26** 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-26**.

The **FC-26** includes the Virtual Serial Port Manager (Kramer VSPM) for compatibility with applications based on COM-port communication. Virtual Serial Port Manager:

- Makes the **FC-26** compatible with all Windows®-based applications which 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-26** interface via a virtual connection which you can emulate over the Ethernet or Internet
- Allows the creation of any number of serial ports on your PC which do not occupy any physical serial ports

3.1 About the Power over Ethernet Feature

Power over Ethernet passes electrical power along with data on Ethernet cabling. This allows a single cable to provide both data connection and electrical power to compatible devices.

4 Defining the FC-26 Ethernet Controller

Figure 2 defines the front panel of the **FC-26.**

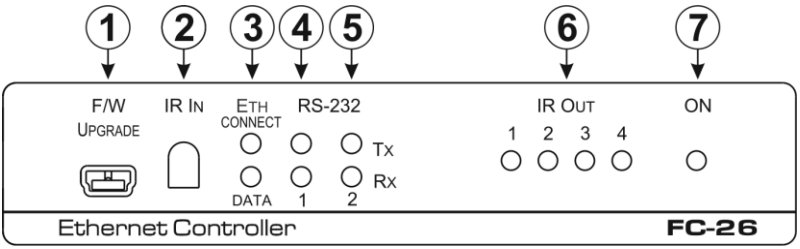

Figure 2: FC-26 Ethernet Controller Front Panel

#	Feature		Function
1	*F/W UPGRADE* Mini USB Connector		Connect to a PC to perform a firmware upgrade
2	*IR IN* Sensor		Sensor for IR learning
3	*ETH* LEDs	*CONNECT*	Lights orange when the Ethernet port is connected
		DATA	Flashes green when data is transferred over the Ethernet link
4	*RS-232* LEDs	*TX 1*	Lights green when data Is transmitted on serial port 1
		RX 1	Lights red when data is received on serial port 1
5		*TX 2*	Lights green when data Is transmitted on serial port 2
		RX 2	Lights red when data is received on serial port 2
6	*IR OUT 1 ~ 4* LEDs		The associated LED lights green when the relevant IR port transmits data
7	*ON* LED		Lights green when the unit is on

Figure 3 defines the rear panel of the **FC-26.**

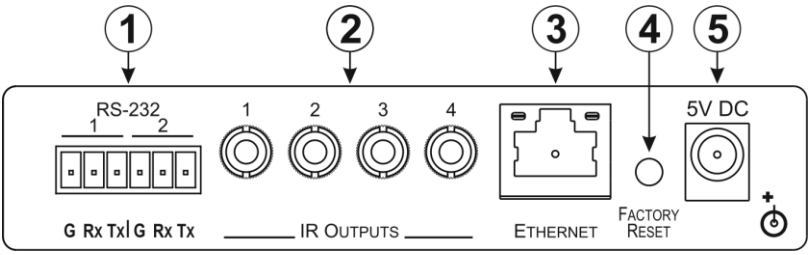

Figure 3: FC-26 Ethernet Controller Rear Panel

#	Feature		Function
1	*RS-232* 6-pin Terminal Block	*1*	Connect to the first RS-232 controlled device
		2	Connect to the second RS-232 controlled device
2	*IR OUTPUTS 1 ~ 4* 3.5mm Mini Jacks		Connect to IR blasters/emitters using cables up to 80 m (260ft) long
3	*ETHERNET* RJ-45 Connector		Connect to a PC or other controller directly or via a LAN (see Section 6.1)
4	*FACTORY RESET* Button		Press and hold while power-cycling the device to reset to factory default parameters, (see Section 10)
5	*5V DC* Connector		Connect to the 5V DC power supply, center pin positive. Not needed when the device is supplied power by a PoE provider

5 Initial Configuration and Use Overview

This chapter provides an overview of the initial configuration and basic operation of the **FC-26** and comprises:

- Configuring the **FC-26** (see Section 5.1)
- Configuring a virtual port on the PC (see Section 5.2)
- Configuring an Ethernet connection on the PC (see Section 5.3)

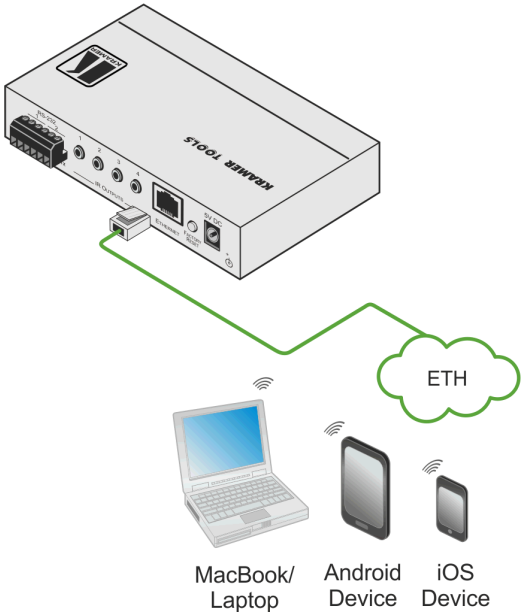

Figure 4: Connecting the FC-26 for Initial Configuration

5.1 Configuring the FC-26 Ethernet Controller

To configure the FC-26:

1. Connect the Ethernet port on the rear panel of the **FC-26** to a PC, either directly or via a LAN, (see Section 6.1).

2. Use **K-Touch** 3.1 to discover the IP address of the **FC-26**.
   You can also use **K-LAN Configurator** to discover the IP address of the **FC-26**.

3. Using a Web browser and the IP address discovered in step 2,browse to the General Info home page (see Figure 11).

4. Click on Device Settings to browse to the Device Settings page, (see Figure 13).

5. Enter the time and date manually, or enter the Time server address for automatic time and date synchronization.

6. Click Save Changes.

7. Click on Communication to browse to the Communication page, (see Figure 14).

8. Enter the IP address, mask and gateway for static IP addressing and Click Set.
   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.

9. Click on Serial Ports Settings to browse to the Serial Port Settings page, (see Figure 15).

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

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

12. Click Save Changes.

13. If required, click on Security to browse to the Security page.

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

15. Enter the required user name and password.

5.2 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-26**.

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

5.3 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-26** configuration, as illustrated in Figure 5.

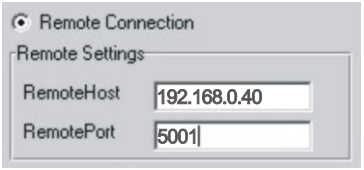

Figure 5: Configuring a Remote Connection

6 Connecting the FC-26

Always switch off the power to each device before connecting it to your **FC-26**. After connecting your **FC-26**, connect its power and then switch on the power to each device.

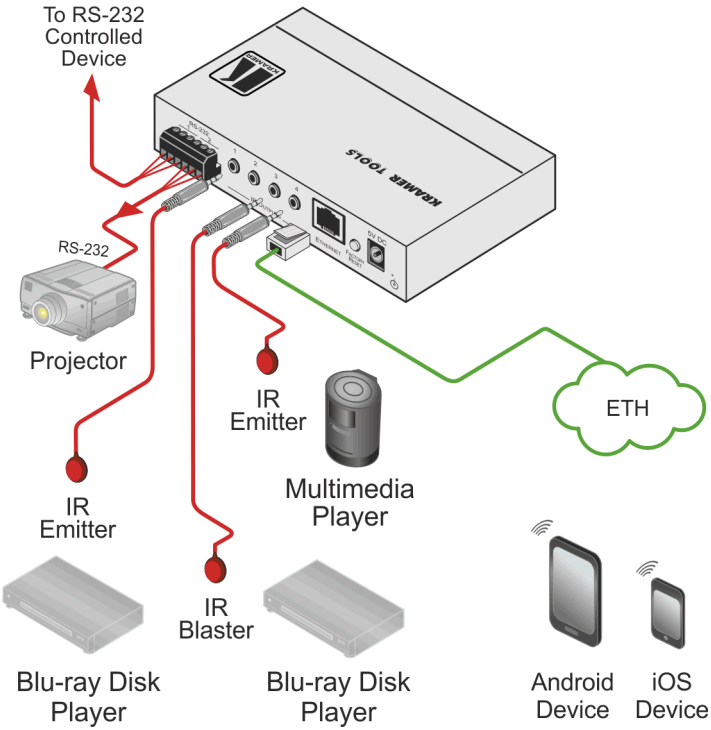

Figure 6: Connecting the FC-26 Ethernet Controller

To connect the FC-26 as illustrated in the example in Figure 6:

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

2. Connect up to two serially controlled devices, (for example, the control port of a switcher and a projector) to the 3-pin, RS-232 terminal blocks.

3. Connect IR emitters to the IR Outputs, (for example, two IR emitters for Blu-ray disk player and multimedia player control, and an IR blaster).

4. If the **FC-26** is not supplied with power by a PoE provider, connect the device to the power adapter and connect the power adapter to the mains electricity (not shown in Figure 6).

6.1 Connecting via Ethernet

You can connect to the **FC-26** 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-26** 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-26** 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 Figure 7.

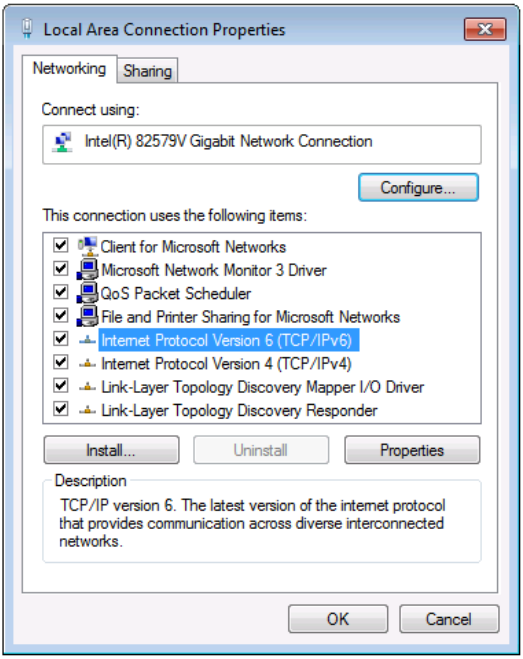

Figure 7: Local Area Connection Properties Window

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.

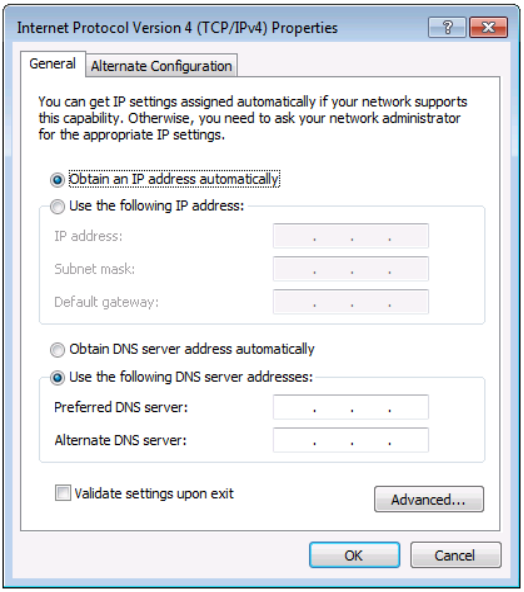

Figure 8: Internet Protocol Version 4 Properties Window

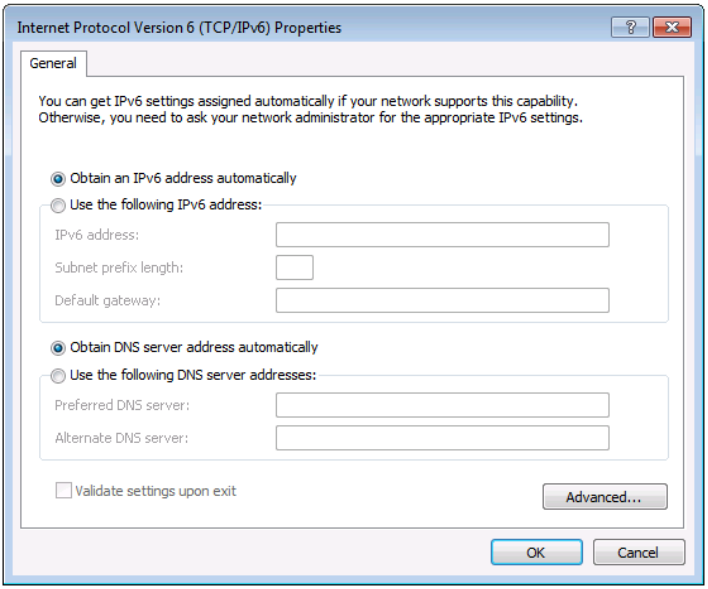

Figure 9: Internet Protocol Version 6 Properties Window

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.

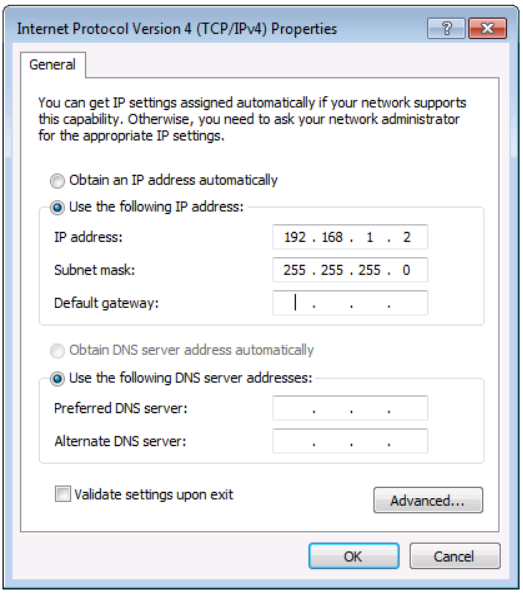

Figure 10: Internet Protocol Properties Window

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-26** to the Ethernet port on a network hub or using a straight-through cable with RJ-45 connectors.

6.1.3 Connecting to the FC-26 via RS-232 or IR

To connect to the FC-26 via RS-232:

- Connect the RS-232, 3-pin, terminal block connectors on the rear panel of the **FC-26** 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-26 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

7 Remote Operation via the Web Pages

The embedded Web pages can be used to remotely operate the **FC-26** using a Web browser and an Ethernet connection.

Before attempting to connect:

- Perform the procedures in Section 6.1.
- Ensure that your browser is supported (see Section 9)

7.1 Browsing the Web Pages

To browse the Web pages:

1. Use **K-Touch** 3.1 to discover the IP address of the **FC-26**.
   You can also use Kramer **LAN Configurator** (available for download from http://www.kramerelectronics.com) to discover the IP address of the **FC-26**.

2. Open your Internet browser. Type the IP address of the device (see Section 10) 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 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.

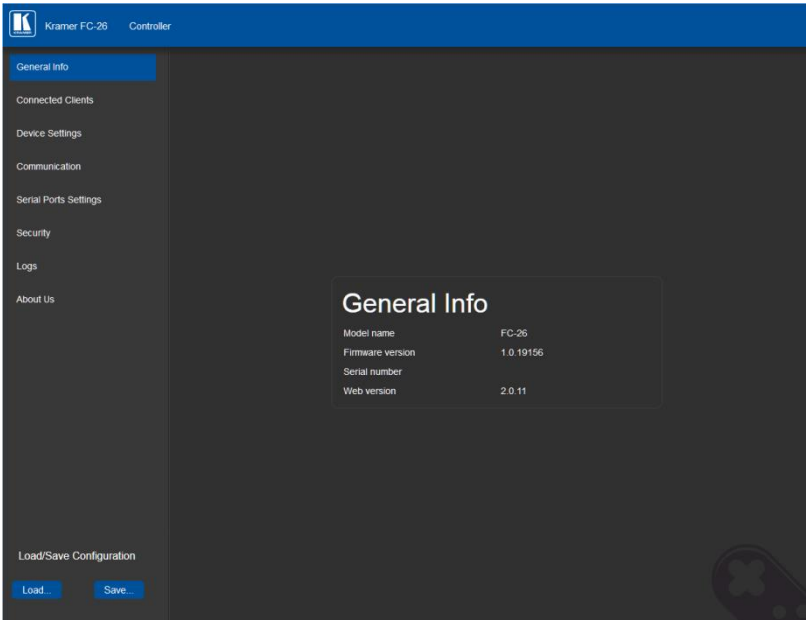

Figure 11: General Info Page

7.1.1 Loading and Saving Configurations

Loading and saving configurations can be performed 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 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.

7.2 Connected Clients Page

The Connected Clients page allows you to view the following details of any client devices connected via Ethernet to the **FC-26**:

- IP address
- The port it is connected to
- Method of connection
- Whether or not Send Replies is enabled for the port

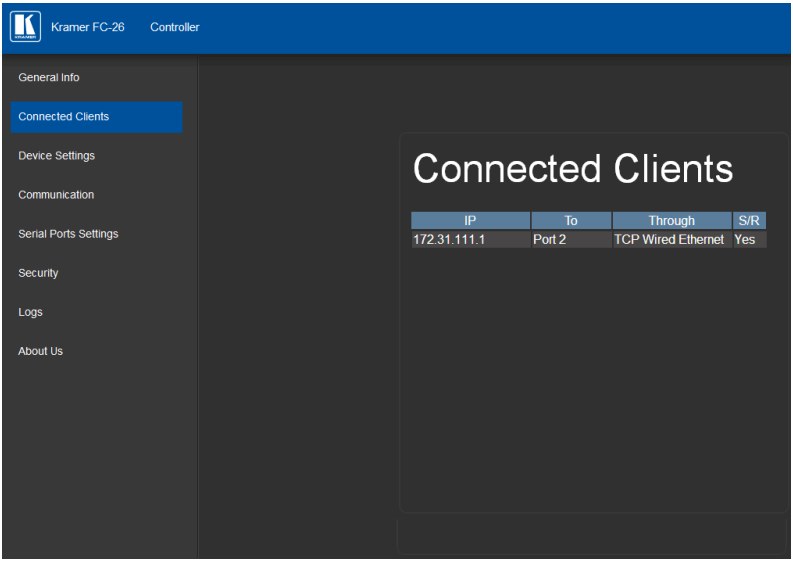

Figure 12: Connected Clients Page

7.3 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

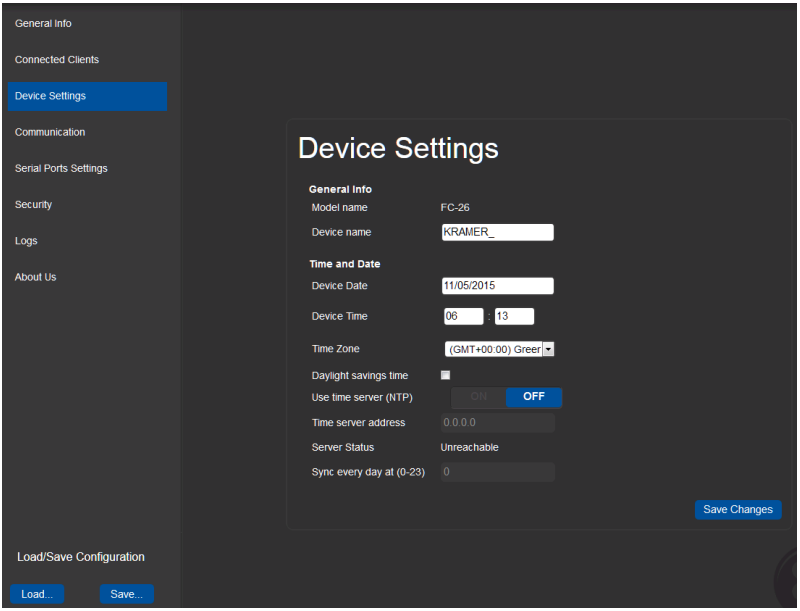

Figure 13: Device Settings Page

The **FC-26** has a built-in clock that can synchronize with a Time Server if required.

To enable Time Server synchronization:

1. Browse to the Device Settings page by clicking Device Settings.
   The Device Settings page is displayed as shown in Figure 13.
2. Click the Use Time Server ON button.
3. Enter the IP address of the Time Server.
4. Enter the time of day at which the **FC-26** should synchronize with the Time Server.
5. Click Save Changes.

7.4 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.

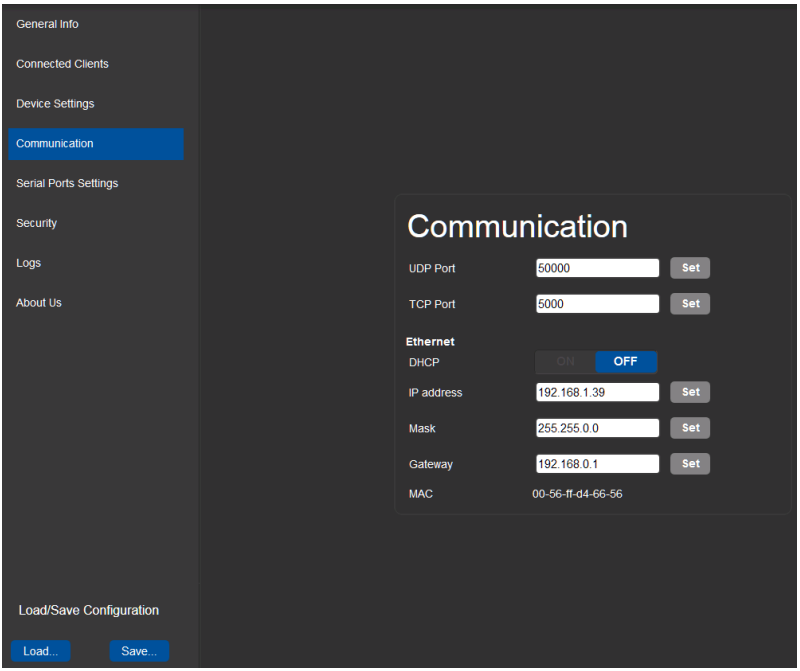

Figure 14: Communication Page

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

7.5 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
- 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

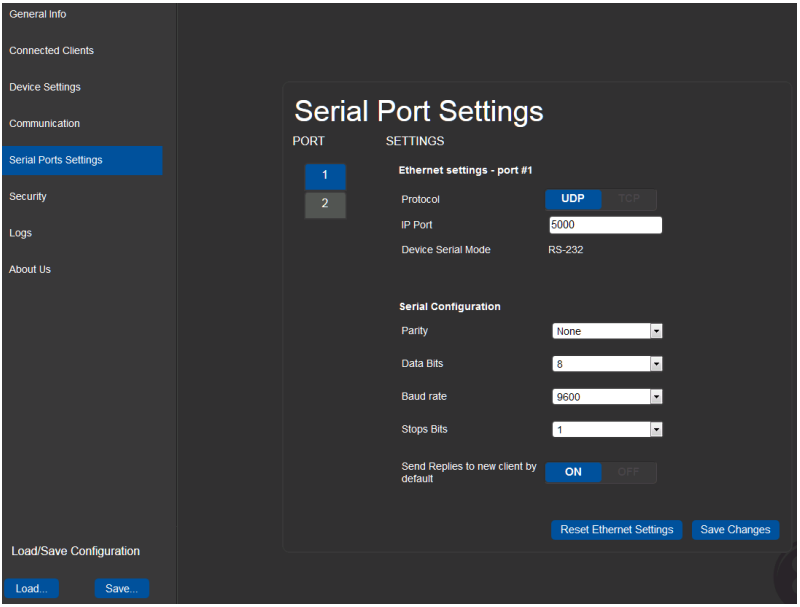

Figure 15: Serial Port Settings Page

7.6 Security Page

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

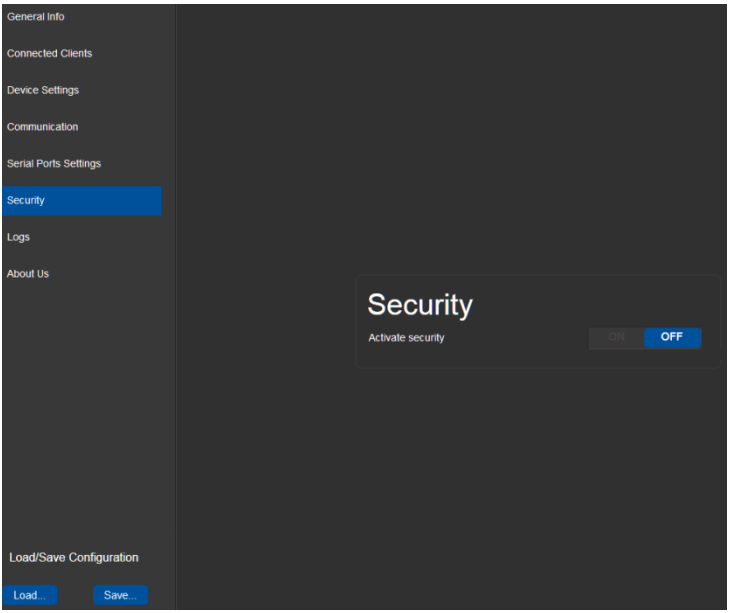

Figure 16: Security Page

When security is on, access to the Web pages is granted only on submission of a valid user and password. For default logon credentials see Section 10.

To activate Web page security:

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

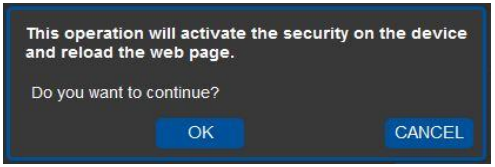

Figure 17: Security Confirmation Popup

2. Click OK.

   The Authentication Required popup is displayed as shown in Figure 18.

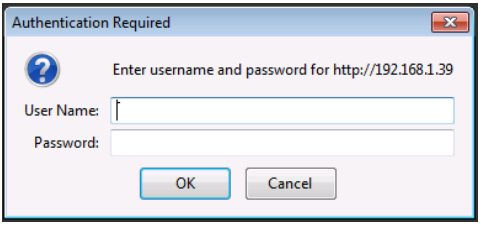

Figure 18: Authentication Required Popup

3. Enter the default 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.

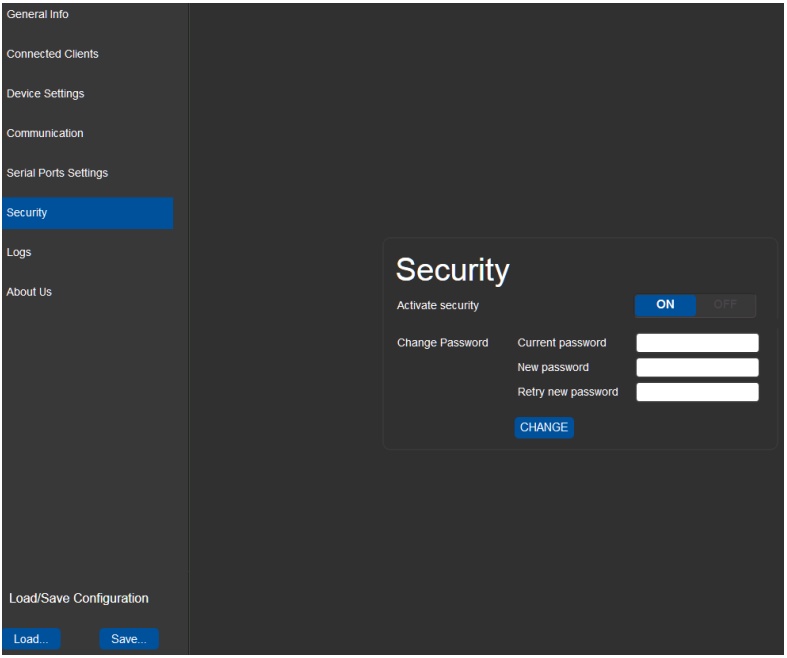

Figure 19: Security Activated Page

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

7.7 Logs Page

The Logs page allows you to:

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

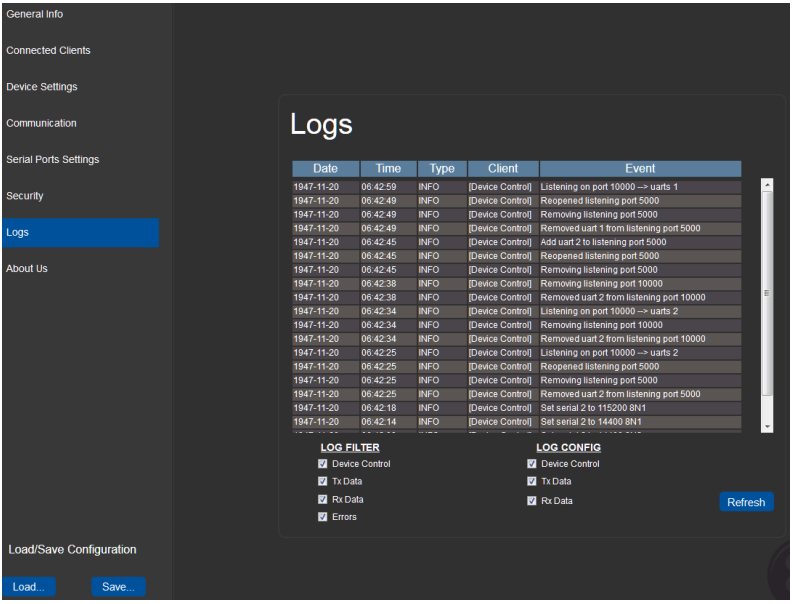

Figure 20: Logs Page

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.

7.8 About Us Page

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

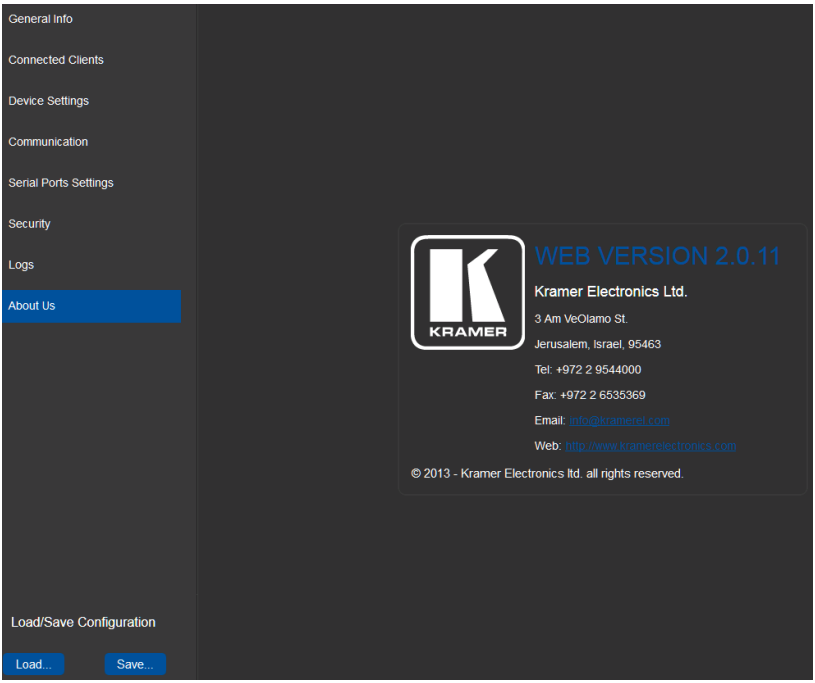

Figure 21: About Us Page

8 Configuring and Maintaining the FC-26

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

OUTPUTS:	4 IR on 3.5mm mini jacks
PORTS:	2 RS-232 serial on 3-pin terminal blocks 1 Ethernet on an RJ-45 connector 1 USB on a 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 FREQUENCIES:	20kHz to 1.2MHz
MAXIMUM DATA HANDLING OF DEVICE:	Up to 150kbps (summed on all ports, see Section 9.1)
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, 230mA
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:	Aluminium
RACK MOUNT:	With optional rack adapter
DIMENSIONS:	12cm x 7.5cm x 2.44cm (4.72” x 2.95” x 0.96”) W, D, H
PRODUCT WEIGHT:	0.182kg (0.4lbs) approx.
SHIPPING WEIGHT:	0.43kg (0.95lbs) 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:	Power adapter, IR Cable C-A35M/IRE-10
OPTIONS:	19“ Rack adapter RK-3T 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	

9.1 Data Handling Performance

The **FC-26** is designed to support mainly AV-relevant RS-232 communication.

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

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

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

9.2 Example Bandwidth Calculation

The **FC-26** has two serial ports. Each serial port can support up to:

- 150kbps / 2 = 75kbps

If each protocol commands 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).

10 Default Communication Parameters

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

Ethernet	
DHCP/static IP Addressing:	DHCP
Maximum Simultaneous Connections:	40

Default Logon Authentication

Web Page Access	
User name:	Admin
Password:	Admin

11 Kramer Protocol 3000

The **FC-26** can be operated using serial commands from a PC, remote controller or touch screen using the Kramer Protocol 3000.

This section describes:

- Kramer Protocol 3000 syntax (see Section 11.1)
- Kramer Protocol 3000 commands (see Section 11.2)

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
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-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
LOG_LEVEL?	Gets current logging level
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

11.3 Kramer Protocol 3000 – Detailed Commands

This section lists the detailed commands applicable to the **FC-26**.

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

Command - **BUILD-DATE?**		Command Type - System-mandatory	
Command Name		**Permission**	**Transparency**
Set:	-	-	-
Get:	**BUILD-DATE?**	End User	Public
Description		**Syntax**	
Set:	Read device build date	#**BUILD-DATE**CR	
Get:	-	-	
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			

Command - **DEL**		Command Type - File System	
Command Name		**Permission**	**Transparency**
Set:	**DEL**	Administrator	Public
Get:	**-**	-	-
Description		**Syntax**	
Set:	Delete file	#**DEL**SP*file_name*CR	
Get:			
Response			
~nn@**DEL**SP*file_name*SP**OK**CR LF			
Parameters			
file_name - name of file to delete (file names are case-sensitive)			
Response Triggers			
Notes			

Command - **DIR**		Command Type - File System	
Command Name		**Permission**	**Transparency**
Set:	**DIR**	Administrator	Public
Get:	**-**	-	-
Description		**Syntax**	
Set:	List files in device	#**DIR**CR	
Get:	-	-	
Response			
Multi Line: ~nn@**DIR**CR LF *file_name* TAB *file_size*SP bytes,SP ID:SP*file_id*CR LF TAB*free_size*SP bytes.CR LF			
Parameters			
file_name - name of file *file_size* - file size in bytes. A file can take more space on device memory *file_id* - internal ID for file in file system *free_size* - free space in bytes in device file system			
Response Triggers			
Notes			

Command - **ETH-PORT**		Command Type - Communication	
Command Name		**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, portNum* CR LF			
Parameters			
portType - TCP/UDP *ETHPort* - TCP/UDP port number			
Response Triggers			
Notes			

Command - **FACTORY**		Command Type - System-mandatory	
Command Name		**Permission**	**Transparency**
Set:	**FACTORY**	End User	Public
Get:	**-**	-	-
Description		**Syntax**	
Set:	Reset device to factory defaults configuration	#**FACTORY** CR	
Get:	-	-	
Response			
~nn@**BUILD-DATE** SP *date* SP *time* CR LF			
Parameters			
Response triggers			
Notes			
This command deletes all user data from the device. The deletion can take some time			

Command - **FORMAT**		Command Type - File System	
Command Name		**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 some time (seconds) until formatting completes			

Command - **FS-FREE?**		Command Type - File System	
Command Name		**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			
Notes			

Command - **GET**		Command Type - File System	
Command Name		**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			
Notes			

Command - **HELP**		Command Type - System-mandatory	
Command Name		**Permission**	**Transparency**
Set:	**-**	-	-
Get:	**HELP**	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get command list or help for specific command	2 options: 1. #**HELP**CR 2. #**HELP**SP*command_name*CR	
Response			
1. Multi-line: ~nn@**Device available protocol 3000 commands:**CR LF*command*,SP*command*…CR LF **To get help for command use: HELP (COMMAND_NAME)**CR LF 2. Multi-line: ~nn@**HELP**SP*command*:CR LF*description*CR LF**USAGE:***usage* CR LF			
Parameters			
Response triggers			
Notes			

Command – **IR-SND**		Command Type - IR	
Command Name		**Permission**	**Transparency**
Set:	**IR-SND**	End User	Public
Get:	**-**	-	-
Description		**Syntax**	
Set:	Send IR command to port	#**IR-SND** *PortNum,Cmdid,CmdName,Repeat, TotalPackages,PackageNum,ProntoCmdDat*	
Get:	-	-	

Response

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

Parameters

Port_Num – [1..4] IR port 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
Repeat – number of times the IR command is transmitted (limited to 50; repeats > 50 are truncated to 50)
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 11.4.3)

Response Triggers

Notes

Command – **IR-STOP**		Command Type - IR	
Command Name		**Permission**	**Transparency**
Set:	**IR-STOP**	End User	Public
Get:	**-**	-	-
Description		**Syntax**	
Set:	Send IR stop command to port	#**IR-STOP** *PortNum,Cmdid,CmdName*	
Get:	-	-	
Response			
~nn@**IR-STOP** *PortNum,Cmdid,CmdName,Status*			
Parameters			
Port_Num – [1..4] IR port 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 11.4.3)			
Response Triggers			
Notes			

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

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

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

Command - NAME		Command Type - System (Ethernet)	
Command Name		**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*SP**OK**CR LF Get: ~nn@**NAME?**SP*machine_name*CR LF			
Parameters			
machine_name - String of up to 14 alpha-numeric chars (can include hyphen, not at the beginning or end)			
Response Triggers			
Notes			
The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on)			

Command - MODEL?		Command Type - System-mandatory	
Command Name		**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			

Command - NAME		Command Type - System (Ethernet)	
Command Name		**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*SP**OK**CR LF Get: ~nn@**NAME?**SP*machine_name*CR LF			
Parameters			
machine_name - String of up to 14 alpha-numeric chars (can include hyphen, not at the beginning or end)			
Response triggers			
Notes			
The machine name is not the same as the model name. The machine name is used to identify a specific machine or a network in use (with DNS feature on)			

Command - NAME-RST		Command Type - System (Ethernet)	
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			

Command - **NET-DHCP**		Command Type - Communication	
Command Name		**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

Set: ~nn@ **NET-DHCP**SP*mode*SP**OK**CR LF

Get: ~nn@ **NET-DHCP**SP*mode*CR LF

Parameters

mode - 0 - Do not use DHCP. Use the IP set by the factory or using the IP set command
1 - Try to use DHCP. If unavailable, use IP as above

Response triggers

Notes

Connecting Ethernet to devices with DHCP may take more time in some networks

To connect with a randomly assigned IP by DHCP, specify the device DNS name (if available) using the command “NAME”. You can also get an assigned IP by direct connection to USB or RS-232 protocol port if available

For proper settings consult your network administrator

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

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

Command - NET-MAC?		Command Type - Communication	
Command Name		**Permission**	**Transparency**
Set:	**-**	-	-
Get:	**NET-MAC?**	End User	Public
Description		**Syntax**	
Set:			
Get:	Get MAC address	#**NET-MAC?**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			

Command - NET-MASK		Command Type - Communication	
Command Name		**Permission**	**Transparency**
Set:	**NET-MASK**	Administrator	Public
Get:	**NET-MASK?**	End User	Public
Description		**Syntax**	
Set:	Set device subnet mask	#**NET-MASK**SP*net_mask*CR	
Get:	Get device subnet mask	#**NET-MASK?**CR	
Response			
Set: ~nn@**NET-MASK**SP*net_mask*SP**OK**CR LF Get: ~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 For proper settings consult your network administrator			
Notes			

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

Command - **PROT-VER?**		Command Type - System-mandatory	
Command Name		**Permission**	**Transparency**
Set:	**-**	-	-
Get:	**PROT-VER?**	End User	Public
Description		**Syntax**	
Set:	-	-	
Get:	Get 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			

Command - **RESET**		Command Type - System-mandatory	
Command Name		**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.			

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

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

Command - **TIME**		Command Type - System	
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*SP**OK**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			

Command - **TIME-LOC**		Command Type - System	
Command Name		**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			

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

Command - **UART**		Command Type - Communication	
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 - 1-4 *baud_rate* - 9600 - 115200 *data_bit* - 7-8 *parity* - See Section11.4.1 Parity Types *stop_bit* - 1-2 *serial1_type* - 232/485 (see Section 11.4.2 Serial Types) *485_term* - 1/0 (optional - this exists exist only when serial1_type = 485)			
Response triggers			
Notes			
In the FC-2x 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			

Command - **VERSION?**		Command Type - System-mandatory	
Command Name		**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			

11.4 Parameters

11.4.1 Parity Types

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

11.4.2 Serial Types

Number	Value
0	232
1	485

11.4.3 IR Transmit Status

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

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

P/N: 2900-300463 Rev: 1