KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

FC-10ETH
Ethernet Controller

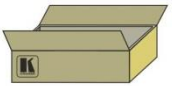
P/N: 2900-000086 Rev 3

FC-10ETH Quick Start Guide

This guide helps you install and use your product for the first time. For more detailed information, go to http://www.kramerelectronics.com/support/product_downloads.asp to download the latest manual or scan the QR code on the left.

Step 1: Check what's in the box

- **FC-10ETH** Ethernet Controller
- 1 Power supply (12V DC)
- 4 Rubber feet
- 1 Quick Start sheet



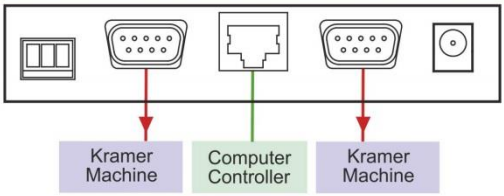
Save the original box and packaging materials in case you need to return your **FC-10ETH** for service.

Step 2: Install the FC-10ETH

Attach the rubber feet and place on a table or mount the **FC-10ETH** in a rack (using an optional **RK-3T** rack mount).

Step 3: Connect the inputs and outputs

Always switch off the power on each device before connecting it to your **FC-10ETH**.



Always use Kramer high-performance cables for connecting AV equipment to the **FC-10ETH.**

Step 4: Connect the power

Connect the 12V DC power adapter to the **FC-10ETH** and plug the adapter into the mains electricity.

Step 5: Operate the FC-10ETH

Configure the **FC-10ETH** using Kramer's Configuration Manager software.

Contents

Figures

1 Introduction

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

Our 1,000-plus different models now appear in 11 groups that are clearly defined by function: GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Routers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters and GROUP 11: Sierra Video Products.

Congratulations on purchasing your Kramer **FC-10ETH** *Ethernet Controller*, which is ideal for use with Ethernet / RS-232 interfaces and/or Ethernet / RS-485 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

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-10ETH** 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 high-performance **FC-10ETH** Ethernet Controller is an easy-to-use, bidirectional hardware and software interface system for controlling Kramer (and also non-Kramer) RS-232 and/or RS-485 controllable machines via Ethernet LAN, as well as via the Internet. In particular, the **FC-10ETH** features:

- Network connectivity that lets you connect a Kramer (or other) device via its RS-232 or RS-485 port to the Ethernet LAN network
  The FC-10ETH data buffer is limited to 128 bytes
- Control of two RS-232 devices (or one RS-232 device and one RS-485 device) via Ethernet, from a PC (set to the Passive routing mode) or other protocol compatible remote controller
- Device control from up to five Ethernet points (PCs or remote controllers)
- Windows®-based Configuration Management software for configuring the **FC-10ETH** unit (including routing mode settings, network settings, serial settings, and destination device settings)
- Internet system remote control (requiring only a dedicated IP address and a modem in the remote location) whether it is a standalone PC or a LAN system
- A 128-byte data buffer making it compatible with most non-Kramer protocols

The **FC-10ETH** includes the Virtual Serial Port Manager (Kramer VSPM) for compatibility with applications based on COM-port communication. The virtual serial port:

- Makes the **FC-10ETH** compatible with all Windows®-based applications that work through an actual COM port. This includes all versions of K-Router and other Kramer control applications. It lets you operate all RS-232 and RS-485 controllable devices via Ethernet LAN using their existing PC software
- Operates like an actual hardware port, that is, a logical COM that behaves like a standard hardware COM but in reality transparently reroutes the data using the TCP/IP network to the **FC-10ETH** interface via a Virtual null modem connection, which you can emulate over the Ethernet or Internet
- Can be created in any quantity on your PC and does not occupy an actual serial port

3.1 Defining the FC-10ETH Ethernet Controller

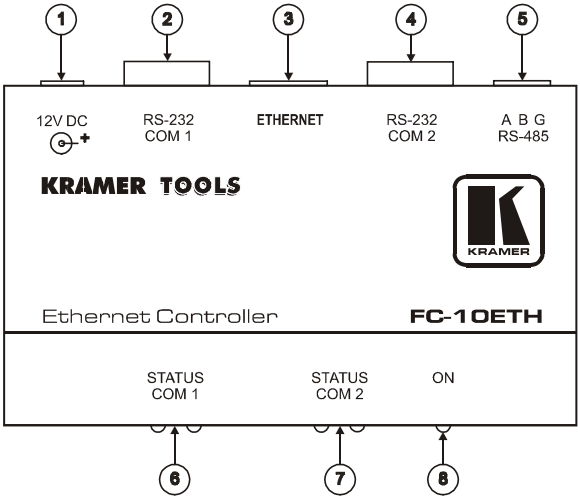


Figure 1: FC-10ETH Ethernet Controller

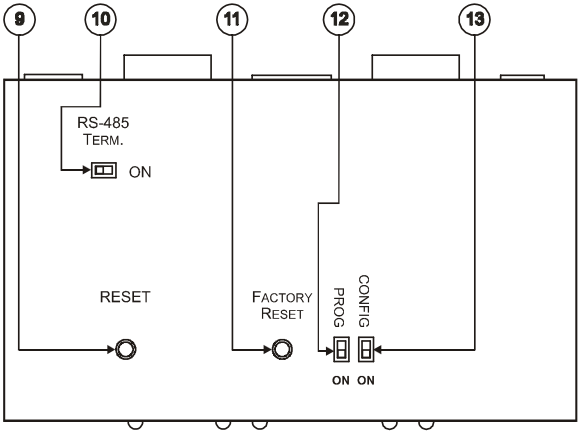


Figure 2: Underside of the FC-10ETH Ethernet Controller

#	Feature	Function
1	*12V DC*	+12V DC connector for powering the unit
2	*RS-232 COM 1* Port	Connects to the RS-232 9-pin D-sub port on the Kramer (or other) device 1 or PC
3	*ETHERNET* Port	Connects to your LAN
4	*RS-232 COM 2* Port	Connects to the RS-232 9-pin D-sub port on a Kramer (or other) device 2 or PC A Kramer device can be connected to either the RS-232 COM 2 port, or to the RS-485 terminal block port (but not to both)
5	*RS-485* Terminal Block Port	Connects to the RS-485 port on a Kramer (or other) device A Kramer device can be connected to either the RS-232 COM 2 port, or to the RS-485 terminal block port (but not to both) PIN A connects to the “A” (+) PIN; PIN B connects to the “B” (–) PIN (and PIN G connects to the “G (Ground)” PIN, if necessary) The connection to G is usually not necessary for RS-485
6	*STATUS COM 1* LEDs	Lit when a signal is transmitted or received from port 1 (mostly used for troubleshooting)
7	*STATUS COM 2* LEDs	Lit when a signal is transmitted or received from port 2 (mostly used for troubleshooting)
8	*ON* LED	Lit when receiving power
9	*RESET* Button	Press to reset the machine Turns the machine off and on again while retaining its definitions (identical to disconnecting the power adapter and then connecting it again)
10	*RS-485 TERM.* Button	Press for BUS termination: Set to OFF if the RS-485 terminal block port is not connected Set to ON if the RS-485 terminal block port is connected
11	*FACTORY RESET* Button	Press to reset to factory default definitions First disconnect the power adapter and then connect it again while pressing the FACTORY RESET button. The unit will power up and load its memory with the factory default definitions
12	*PROG* Switch	Switch ON to upgrade firmware
13	*CONFIG* Switch	Not used, set to OFF

4 Configuring the FC-10ETH Ethernet Controller

This section describes:

- How to connect the **FC-10ETH** for configuration, via its ETHERNET port (see Section 4.1)
- How to install and run the Configuration Manager software (see Section 4.2)
- The Configuration Manager Window features (see Section 4.3)

4.1 Operating via Ethernet

You can connect to the **product** via Ethernet using either of the following methods:

- Directly to the PC using a crossover cable (see Section 4.1.1)
- Via a network hub, switch, or router, using a straight-through cable (see Section 4.1.2)

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.

4.1.1 Connecting the Ethernet Port Directly to a PC

You can connect the Ethernet port of the **FC-10ETH** 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-10ETH** with the factory configured default IP address.

After connecting the **FC-10ETH** 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 3.

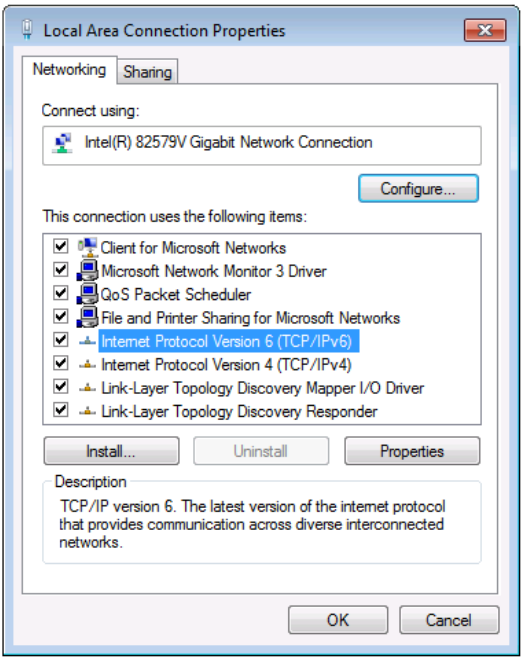


Figure 3: Local Area Connection Properties Window

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

5. Click **Properties**.
   The Internet Protocol Properties window relevant to your IT system appears as shown in Figure 4 or Figure 5.

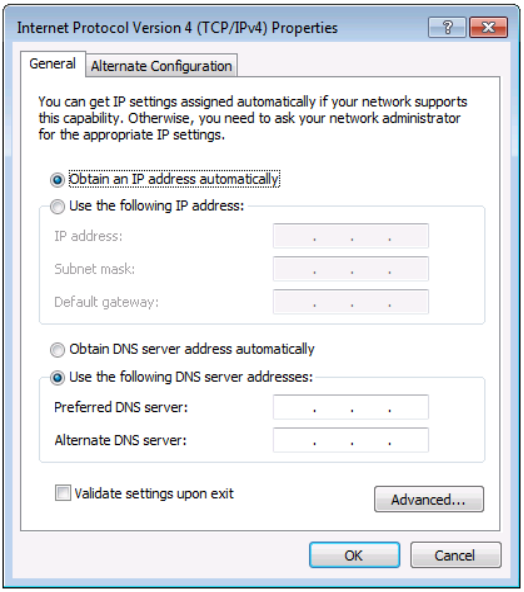


Figure 4: Internet Protocol Version 4 Properties Window

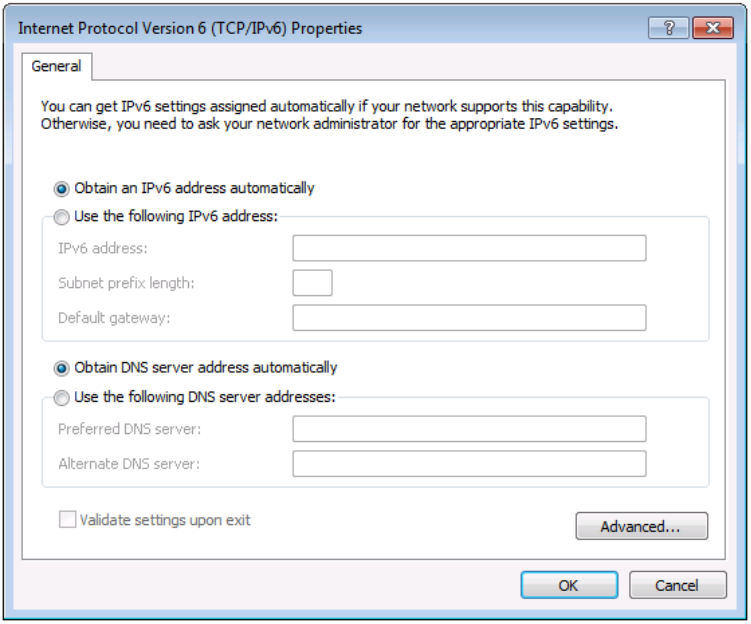


Figure 5: Internet Protocol Version 6 Properties Window

6. Select **Use the following IP Address** for static IP addressing and fill in the details as shown in Figure 6.
   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.

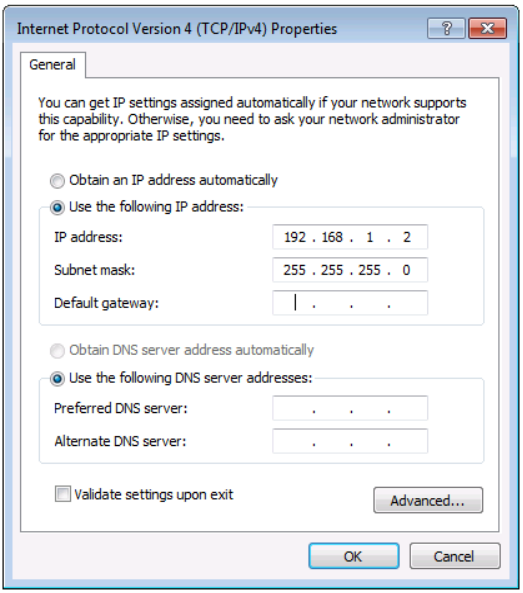


Figure 6: Internet Protocol Properties Window

7. Click **OK**.

8. Click **Close**.

4.1.2 Connecting the Ethernet Port via a Network Hub or Switch

You can connect the Ethernet port of the **FC-10ETH** to the Ethernet port on a network hub or using a straight-through cable with RJ-45 connectors.

4.1.3 Control Configuration via the Ethernet Port

To control several units via Ethernet, connect the Master unit (Device 1) via the Ethernet port to the Ethernet port of your PC. Use your PC provide initial configuration of the settings (see Section 4.1).

4.2 Installing and Configuring the FC-10ETH

To configure the **FC-10ETH** via the ETHERNET, do the following:

1. Connect the **FC-10ETH** as described in Section 4.1 (see Figure 7)

2. Click the appropriate shortcut in the Start menu's Programs folder.
   The **FC-10ETH** Configuration Manager window (see Figure 8) opens.

3. Click the Search button to automatically search for devices (or the Search Board command on the Action menu).
   The MAC Address for the found "**FC-10ETH**" appears in the Device List.

4. Change the settings according to your network requirements and then click the Config button (or the Config command on the Action menu) to apply the settings.

Note that clicking the Config button will alter the IP settings of the **FC-10ETH**.

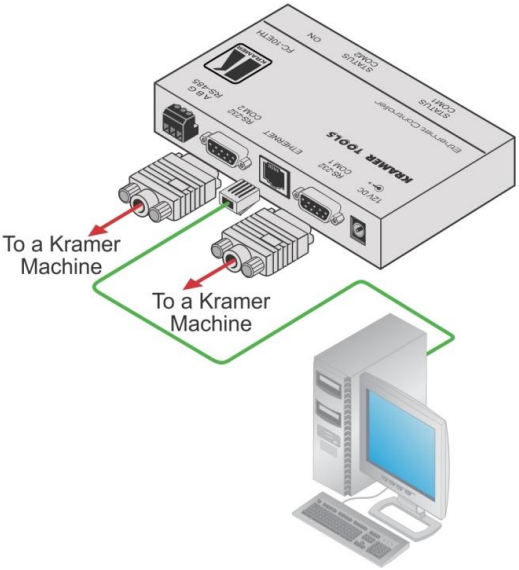


Figure 7: Connecting the FC-10ETH for Configuration

4.3 Defining the Kramer FC-10ETH Manager

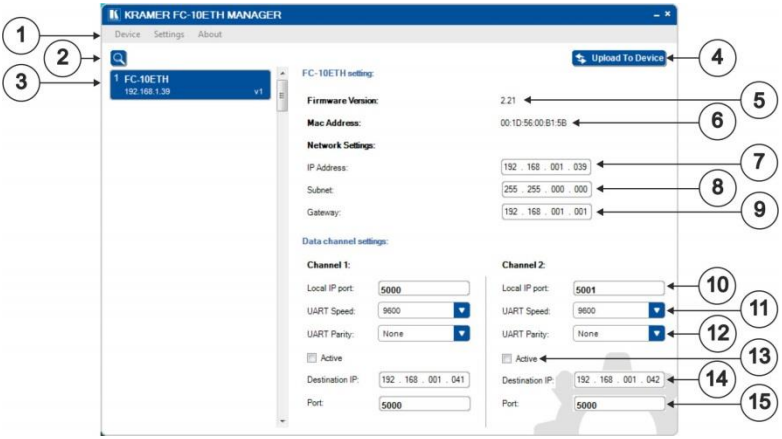


Figure 8: FC-10ETH Manager Window

#	Feature		Function
1	Menu Bar	DEVICE	**Search** for all connected devices
			Upload configuration to device (same as button 4)
		SETTINGS	Sets the broadcast address and the broadcast network interface
		ABOUT	Displays software development information, including the software version
2	Search Button		Seeks the **FC-10ETH** devices that connect to the PC via the ETHERNET port, and displays them and their corresponding settings
3	Device List		Displays the MAC Addresses for the **FC-10ETH** devices, connected via the selected port (LAN or COM) and the version (V1 and V2) of the device
4	UPLOAD TO DEVICE		Press to upload the displayed configuration to the device
5	FC-10ETH Setting	FIRMWARE VERSION	Displays the firmware version
6		MAC ADDRESS	Displays the MAC Addresses for the **FC-10ETH** devices, connected via the selected port (LAN or COM)
7		IP ADDRESS	A 32-binary digit number obtained from your Network Administrator that identifies the **FC-10ETH** device that is currently being configured in the Ethernet or Internet
8		SUBNET	A 32-binary digit number obtained from your Network Administrator, which combined with the IP Address, identifies which network your **FC-10ETH** device is on
9		GATEWAY	A network position serving as an entry to another network or to the Internet (only relevant in the Active Routing mode)

#	Feature		Function
10	Data Channel Setting	LOCAL IP PORT	An address (for the local ports COM 1 and COM 2) on the **FC-10ETH** device that is currently being configured, which provides a direct route from another Ethernet point application
11		UART SPEED	Choose the appropriate baud speed (1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115200)
12		UART PARITY	Choose the required parity (None, Odd, Even, Mark or Space)
13		ACTIVE Checkbox	When cleared, activates the Passive mode (see Section 4.4.1) When selected, activates the Active mode (see Section 4.4.2) **Note:** Only appears for V1 devices, not present for V2 devices
14		DESTINATION IP	A 32-binary digit number that identifies the destination **FC-10ETH** device in the Ethernet or Internet
15		PORT	A pre-assigned address of the destination **FC-10ETH** device that provides a direct route to its Transport layer The Destination Settings area is active only when the Active Mode check box is selected

4.4 Routing Data

There are two versions of the **FC-10ETH**, version 1 (V1) and version 2 (V2). The version is shown on the Device List entry (see item 3 on Figure 8).

- V1 devices use passive (see Section 4.4.1) and active (Section 4.4.2) routing modes. The Active checkbox (see item 13 on Figure 8) is displayed only for V1 devices
- V2 devices only use the passive routing mode (see Section 4.4.1). No Active checkbox is displayed for V2 devices

4.4.1 The Passive Routing Mode for V1 and V2 Devices

In the Passive routing mode, the **FC-10ETH** never opens the Ethernet communication first, and only replies to the connection requests coming from the active remote stations. Serial data that is received at the serial port of the **FC-10ETH,** before the remote station contacts the **FC-10ETH**, is discarded.

In the Passive mode, the **FC-10ETH** will work with any station on the network that contacts it (but not more than five stations simultaneously, three via COM 1 and two via COM 2), as the example in Figure 9 illustrates.

To configure the **FC-10ETH** to the Passive mode, connect it and do the following:

Only for V.1 devices because this is the default mode. V.2 has no configuration.

1. Press the Search button to find the device connected to the PC.
2. Set the IP address number according to your network requirements.
3. For V1 devices, clear the Active Mode check box (if selected) in the configuration manager. (This does not appear for V2 devices).
4. Press the Config button to accept changes.

4.4.2 The Active Routing Mode for V1 Devices Only

In the Active routing mode (V1 devices only), the **FC-10ETH** does not wait for the remote station to send the connection request first, it sends the connection request and routes the data in the destination device direction as soon as there is data to be sent. The data is always sent to a specific destination (as defined by the Destination IP address and the Destination Port Number Settings of the **FC-10ETH**).

To configure the **FC-10ETH** to the Active mode, connect it and do the following:

1. Press the Search button to find the device connected to the PC.
2. Set the IP address number according to your network requirements.
3. Select the Active Mode check box in the configuration manager.
4. Set the Destin. IP and Port in the Destination Settings Area, for CHANNEL 1 and CHANNEL 2.
5. Press the Config button to accept changes.

5 Controlling Machines via the Ethernet using the FC-10ETH

You can use your **FC-10ETH** to control a Kramer or non-Kramer RS-232/RS-485 machine:

- From computers that connect to a LAN, as well as via an Internet connection (see Section 5.1)
- Via a controller, as well as via an Internet connection (see Section 5.2).

5.1 Controlling a Machine via a Computer

To control a Kramer machine via five computers, as illustrated in the example in Figure 9, do the following:

1. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity.
2. Configure the **FC-10ETH** to the Passive routing mode (see Section 4.4.1).
3. Connect up to two machines, that is, connect the RS-232:
   - COM 1 port of the **FC-10ETH** to the RS-232 port of your Kramer/non-Kramer machine (1) via a null modem
   - COM 2 port of the **FC-10ETH** to the RS-232 port of your Kramer/non-Kramer machine (2) via a null modem (alternatively, you can connect the RS-485 terminal block port of the **FC-10ETH** to the RS-485 port of your Kramer/non-Kramer machine)

     To connect the RS-485 block port, Connect PIN A to the “A” (+) PIN and PIN B to the “B” (–) PIN.
4. Connect the ETHERNET port of your **FC-10ETH** to a LAN, using a straight-through cable with RJ-45 connectors.

   You can control from up to 5 computers (three via COM1 and two via COM 2), each with its control software.
5. Run the Kramer Windows®-based control software to control the Kramer machine from each computer.

   When working with a non-Kramer device, use that device’s PC software.

6. Select either:

   - A virtual COM port if the control application cannot directly connect to the Ethernet driver (see Section 5.1.1), or
   - An Ethernet port connection if the control application can directly connect to the Ethernet driver (see Section 5.1.2)

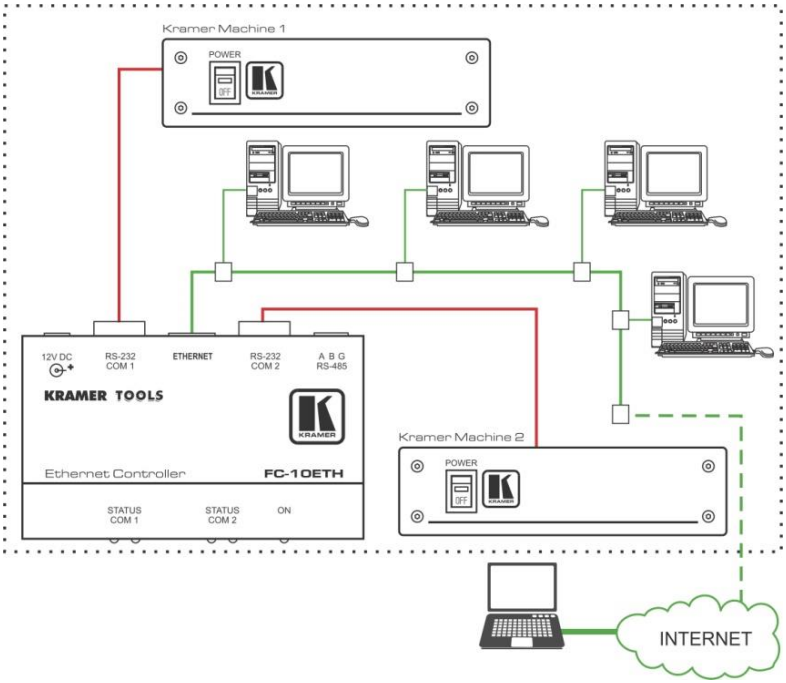


Figure 9: Connecting the FC-10ETH in the Passive Routing Mode

5.1.1 Setting a Virtual Port

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-10ETH**.

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.

5.1.2 Setting an Ethernet Connection

If the control application can directly connect to the Ethernet driver, select the host IP and port number according to your **FC-10ETH** configuration, as illustrated in Figure 10.

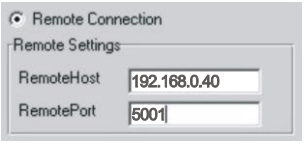


Figure 10: The Port Window – Selecting a Remote Connection

5.2 Controlling a Kramer Machine via a Serial Controller

To control a Kramer machine via serial controllers (in the Active routing mode), as illustrated in the example in Figure 11, do the following:

For passive and active routing modes, see Section 4.4.

1. Connect the **FC-10ETH (A)** 12V DC power adapter to the power socket and connect the adapter to the mains electricity.
2. Configure the **FC-10ETH (A)** to the Passive routing mode (see Section 4.4.1).
3. Disconnect unit **(A)**.

Unit **(A)** is configured to the Passive mode.

4. Connect the **FC-10ETH (B)** 12V DC power adapter to the power socket and connect the adapter to the mains electricity.
5. Configure the **FC-10ETH (B)** to the Active routing mode (see Section 4.4.2) and then Disconnect unit **(B)**. Make sure that the:
   - Destin. IP set in unit **(B)** is identical to the IP address on unit **(A)**
   - Destination Settings Area for CHANNEL 1 and CHANNEL 2 of unit **(B)** are set to be identical to the Port numbers in the Local Ports on CHANNEL 1 and CHANNEL 2 or according to the connections we want to establish with unit **(A)**

Unit **(B)** is configured to the Active mode.

6. Connect units **(A)** and **(B)** to your network or Ethernet router, as illustrated in Figure 11.

7. Connect up to two machines, that is, the RS-232:

   - COM 1 port of the **FC-10ETH (A)** to the RS-232 port of your machine 1 (for example, a Kramer machine) via a null modem adapter
   - COM 2 port of the **FC-10ETH (A)** to the RS-232 port of your machine 2 (for example, a Kramer machine) via a null modem adapter (alternatively, you can connect the RS-485 port of unit **(A)** to the RS-485 port of your Kramer machine).

     To connect the RS-485 port, connect PIN A to the "A" (+) PIN and PIN B to the "B" (–) PIN

8. Connect up to two serial controllers to unit **(B)**:

   - Connect the RS-485 terminal block of the serial controller (1) to the RS-485 terminal block port on the **FC-10ETH (B)**

     Alternatively, you can connect an RS-232 output terminal block of the serial controller to the RS-232 COM 2 port of the FC-10ETH
   - Connect the RS-232 port of the serial controller (2) to the RS-232 COM 1 port on the **FC-10ETH (B)**

9. Connect the power on each of the devices as follows:

   - The Kramer machines
   - **FC-10ETH (A)**

     Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity
   - **FC-10ETH (B)**

     Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity
   - The serial controllers

A connection is established after the user sends the first command from the serial controller to the serial controlled device.

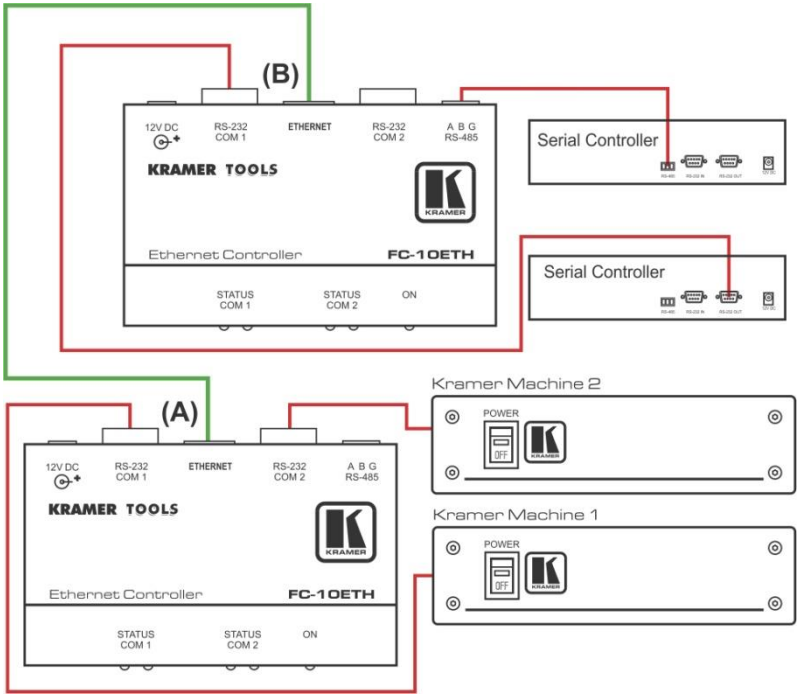


Figure 11: Connecting the FC-10ETH in the Active Routing Mode

6 Flash Memory Upgrade

The **FC-10ETH** firmware is located in FLASH memory, which lets you upgrade to the latest Kramer firmware version in minutes!

6.1 Upgrading Version 1 Devices

The process involves:

- Downloading the upgrade package from the Internet (see Section 6.1.1)
- Connecting the PC to the RS-232 port (COM 1) (see Section 6.1.2)
- Upgrading the firmware (see Section 6.1.3)

6.1.1 Downloading from the Internet

You can download the up-to-date file from the Internet (file names are liable to change from time to time). To download:

1. Go to our Web site at http://www.kramerelectronics.com and download the file: *fc10eth_11.zip*" from the technical support section.
2. Extract the file *fc10eth_11.zip*" package, which includes the KFR-Programmer application setup and the *.s19* firmware file, to a folder (for example, C:\Program Files\KFR Upgrade).
3. Install the KFR-Programmer Application.

6.1.2 Connecting the PC to the RS-232 Port

Before installing the latest Kramer firmware version on the **FC-10ETH**, do the following:

1. Connect the RS-232 9-pin D-sub port (COM 1) on the **FC-10ETH** to a null modem adapter and connect the null modem adapter with a 9-wire flat cable to the RS-232 9-pin D-sub COM port on your PC.
2. Set the PROG dipswitch to ON.
3. Connect the power on your machine.

6.1.3 Upgrading the Firmware

Follow these steps to upgrade the firmware:

1. Double click the KFR-Programmer desktop icon.
   The KFR-Programmer window appears (see Figure 12).

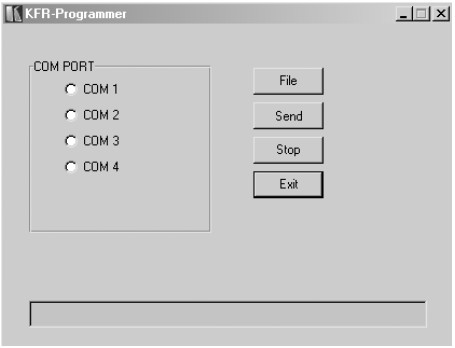


Figure 12: The KFR-Programmer Window

2. Select the required COM Port to which the **FC-10ETH** is connected on your PC.
3. Press the File button to select the *.s19* firmware file included in the package.
4. Press the Send button to download the file. The Send button lights red.
5. Wait until downloading is completed and the red Send button turns off.

6.2 Upgrading Version 2 Devices

To upgrade the firmware of Version 2 devices, refer to the *K-Upload User Guide* available at http://www.kramerelectronics.com/support/product_downloads.asp.

7 Technical Specifications

ETHERNET INTERFACE:	10/100BaseT Ethernet
SERIAL INTERFACES:	2 RS-232 connectors, signals: RX, TX, RTS, CTS, Ground on 9-pin D-sub ports 1 RS-485 on a detachable terminal block connector
NETWORK PROTOCOLS:	ICMP, ARP (ping), TCP, UDP
POWER CONSUMPTION:	12V DC, 140mA
DIMENSIONS:	12cm x 7.5cm x 2.5cm (4.7" x 2.95" x 0.98"), W, D, H
WEIGHT:	0.3kg (0.25lbs) approx.
ACCESSORIES:	Power supply, mounting bracket
OPTIONS:	RK-3T 19" rack adapter
Specifications are subject to change without notice Go to our Web site at http://www.kramerelectronics.com to access the list of resolutions	

LIMITED WARRANTY

The warranty obligations of Kramer Electronics for this product are limited to the terms set forth below:

What is Covered

This limited warranty covers defects in materials and workmanship in this product.

What is Not Covered

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Kramer Electronics to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover cartons, equipment enclosures, cables or accessories used in conjunction with this product.

Without limiting any other exclusion herein, Kramer Electronics does not warrant that the product covered hereby, including, without limitation, the technology and/or integrated circuit(s) included in the product, will not become obsolete or that such items are or will remain compatible with any other product or technology with which the product may be used.

How Long Does this Coverage Last

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

Who is Covered

Only the original purchaser of this product is covered under this limited warranty. This limited warranty is not transferable to subsequent purchasers or owners of this product.

What Kramer Electronics will do

Kramer Electronics will, at its sole option, provide one of the following three remedies to whatever extent it shall deem necessary to satisfy a proper claim under this limited warranty:

1. Elect to repair or facilitate the repair of any defective parts within a reasonable period of time, free of any charge for the necessary parts and labor to complete the repair and restore this product to its proper operating condition. Kramer Electronics will also pay the shipping costs necessary to return this product once the repair is complete.
2. Replace this product with a direct replacement or with a similar product deemed by Kramer Electronics to perform substantially the same function as the original product.
3. Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

What Kramer Electronics will not do Under This Limited Warranty

If this product is returned to Kramer Electronics or the authorized dealer from which it was purchased or any other party authorized to repair Kramer Electronics products, this product must be insured during shipment, with the insurance and shipping charges prepaid by you. If this product is returned uninsured, you assume all risks of loss or damage during shipment. Kramer Electronics will not be responsible for any costs related to the removal or re-installation of this product from or into any installation. Kramer Electronics will not be responsible for any costs related to any setting up this product, any adjustment of user controls or any programming required for a specific installation of this product.

How to Obtain a Remedy under this Limited Warranty

To obtain a remedy under this limited warranty, you must contact either the authorized Kramer Electronics reseller from whom you purchased this product or the Kramer Electronics office nearest you. For a list of authorized Kramer Electronics resellers and/or Kramer Electronics authorized service providers, please visit our web site at www.kramerelectronics.com or contact the Kramer Electronics office nearest you.

In order to pursue any remedy under this limited warranty, you must possess an original, dated receipt as proof of purchase from an authorized Kramer Electronics reseller. If this product is returned under this limited warranty, a return authorization number, obtained from Kramer Electronics, will be required. You may also be directed to an authorized reseller or a person authorized by Kramer Electronics to repair the product.

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

Limitation on Liability

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

Exclusive Remedy

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

Other Conditions

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

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

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

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

We welcome your questions, comments, and feedback.
Web site: www.kramerelectronics.com
E-mail: info@kramerel.com

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

P/N: 2900-000086 Rev: 3