

Kramer Electronics, Ltd.



USER MANUAL

Model:

FC-2

USB / RS-485 Converter

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1 Introduction

Dedication by Kramer Electronics since 1981, to the development and manufacture of high quality video/audio equipment, makes the Kramer line an integral part of the finest production and presentation facilities in the world. In recent years, Kramer has redesigned and upgraded most of the line, making the best even better! The Kramer line of professional video/audio electronics is one of the most versatile and complete available, and is a true leader in terms of quality, workmanship, price/performance ratio and innovation. In addition to our high quality converters, like the Kramer **FC-2 USB / RS-485 Converter**, we also offer excellent switchers and matrices, distribution amplifiers, presentation processors, interfaces, and computer-related products. Congratulations on purchasing your Kramer **FC-2 USB / RS-485 Converter**, which is ideal for controlling switchers or other serial interface devices via their RS-485 or RS-422 ports from the Universal Serial Bus (USB) port on a desktop computer or laptop.

The package includes the following items:

- **FC-2 USB / RS-485 Converter**
- USB (type B connector to type A connector) cable
- Windows® 98/ME/2000/XP compatible software driver on a floppy disk
- This user manual¹ and the Kramer concise product catalog/CD

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

3 Overview

Your **FC-2** is an adjustment-free², Plug and Play bi-directional USB to RS-485 or USB to RS-422 converter that incorporates the USB, RS-485³, and RS-422³ video and presentation industry interfaces.

Achieve the best performance by connecting only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables).

¹ Download up-to-date Kramer user manuals from the Internet at this URL: <http://www.kramerelectronics.com/manuals.html>

² Accepting data, for example, on the USB interface and automatically translating it to the RS-485 or the RS-422 interface

³ With a 1200 meter range

Position your **FC-2** in a location free from moisture and away from excessive sunlight and dust.

4 Your FC-2 USB / RS-485 Converter

Figure 1 and Table 1 define the **FC-2 USB / RS-485 Converter**:

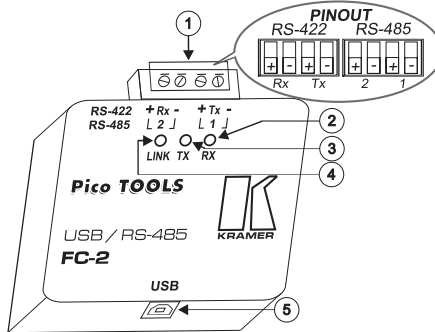


Figure 1: FC-2 USB / RS-485 Converter

Table 1: Features and Functions of the FC-2 USB / RS-485 Converter

#	Feature	Function
1	RS-422 Terminal Block Connector	Connects to the RS-422 port on the controller or broadcasting VTR
	RS-485 Terminal Block Connector	Connects to the RS-485 port on the switcher or controller
2	RX LED	Red LED is on when data transmits from an RS422/485 device to the USB port
3	TX LED	Green LED is on when data transmits from a USB port to an RS422/485 device
4	LINK LED	Yellow LED is on when the FC-2 is ready for use
5	USB Port	Connects to the PC's USB port or Hub

4.1 Installing the Software Driver

To install the Windows® 98/ME/2000/XP compatible software driver:

1. Connect the USB port on the **FC-2** to the USB port on the PC.
2. Insert the floppy disk in the floppy disk drive and follow the on-screen instructions.

4.2 Uninstalling the Software Driver

To uninstall the Windows® 98/ME/2000/XP compatible software driver:

1. Insert the floppy disk in the floppy disk drive.
2. Run the Uninstall.exe program.
3. Restart the PC¹.

¹ At this stage you can reinstall the driver, by following the instructions in section 4.1

5 Using the FC-2 USB / RS-485 Converter

By connecting a PC to the USB port on the **FC-2** USB / RS-485 Converter, you can control switchers via RS-485 (see section 5.1), or a Broadcasting VTR via RS-422 (see section 5.2).

5.1 Connecting a PC to Switchers (RS-485)

To connect your PC to switchers via RS-485 (up to a range of 1200 meters), as the example in Figure 2 illustrates, do the following:

1. Connect the USB port on the PC to the USB port on the **FC-2**, using the USB cable (provided).
2. Connect the RS-485 port by connecting the “+” and “-” PINs on the **FC-2** to the “+” and “-” PINs respectively on each switcher.
3. Set the DIPS on each switcher¹ so that each switcher can be identified on the RS-485 control interface via its unique MACHINE #.
4. Turn on the power on the switchers² and run the control software.

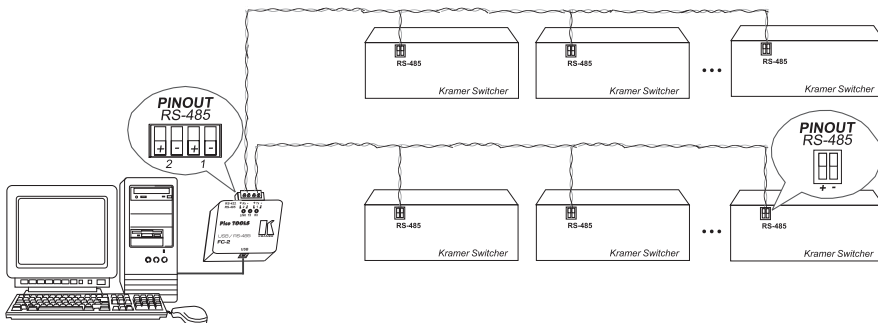


Figure 2: USB / RS-485 Control using the FC-2 USB / RS-485

5.2 Connecting a PC to a Broadcasting VTR (RS-422)

To connect your PC to a Broadcasting VTR via RS-422 (up to a range of 1200 meters), as the example in Figure 3 illustrates, do the following:

1. Connect the USB port on the PC to the USB port on the **FC-2**, using the USB cable (provided).
2. Connect the RS-422 port, as follows:

1 Refer to the user manual for the appropriate switcher. Up -to-date Kramer user manuals can be downloaded from the Internet at <http://www.kramerelectronics.com/manuals.html>

2 The yellow LINK LED lights, indicating that the FC-2 is ready for use. The green TX LED will light when transmitting data from the PC to one or more of the switchers. The red RX LED will light when transmitting data from one or more of the switchers to the PC

- Connect the “Rx +” PIN on the **FC-2** to the “Tx +” PIN on the Broadcasting VTR and the “Rx -” PIN on the **FC-2** to the “Tx -” PIN on the Broadcasting VTR
 - Connect the “Tx +” PIN on the **FC-2** to the “Rx +” PIN on the Broadcasting VTR and the “Tx -” PIN on the **FC-2** to the “Rx -” PIN on the Broadcasting VTR
3. Turn on the power on the PC and on the Broadcasting VTR¹.

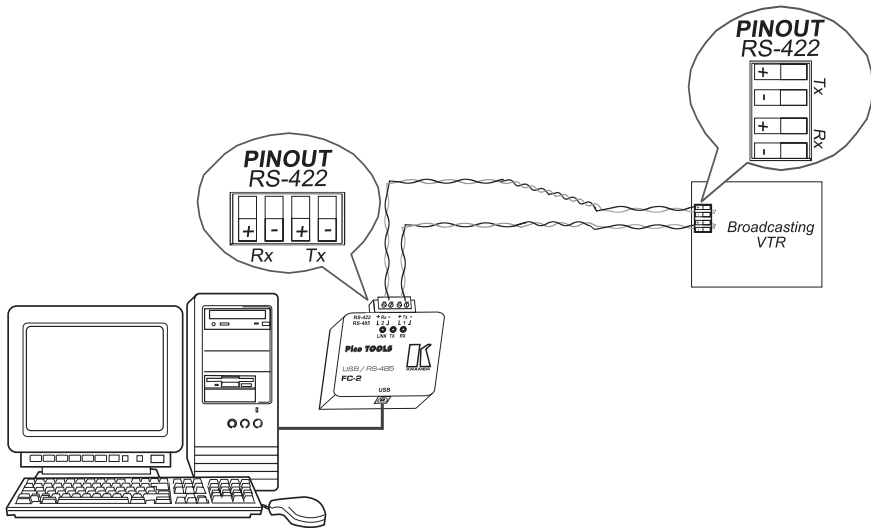


Figure 3: USB / RS-422 Control using the FC-2 USB / RS-485

6 Technical Specifications

Table 2: Technical specifications² of the FC-2 USB / RS-485 Converter

INTERFACE:	RS-422/RS-485 Terminal Block connector, Full, 8N1, max 250kbps, 10kV ESD USB Port (fully compliant with the USB Specification V 1.1)
LEDS:	LINK (yellow) LED lights when the FC-2 is ready for use TX (green) LED lights when data is transmitted from the USB port to the RS422/485 device RX (red) LED lights when data is transmitted from the RS422/485 device to USB port
DIMENSIONS:	6 cm x 6.5 cm x 2.5cm (2.36" x 2.56 x 1", W, D, H)
WEIGHT:	0.115 kg. (0.25 lbs.) approx.
ACCESSORIES:	USB Cable, Windows® 98/ME/2000/XP compatible software driver

¹ The yellow LINK LED lights, indicating that the FC-2 is ready for use. The green TX LED will light when transmitting data from the PC to the Broadcasting VTR. The red RX LED will light when transmitting data from the Broadcasting VTR to the PC

² Specifications are subject to change without notice

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for three years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed.
3. Damage, deterioration or malfunction resulting from:
 - i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
 - ii) Product modification, or failure to follow instructions supplied with the product
 - iii) Repair or attempted repair by anyone not authorized by Kramer
 - iv) Any shipment of the product (claims must be presented to the carrier)
 - v) Removal or installation of the product
 - vi) Any other cause, which does not relate to a product defect
 - vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

- EN-50081: "Electromagnetic compatibility (EMC);
generic emission standard.
Part 1: Residential, commercial and light industry"
- EN-50082: "Electromagnetic compatibility (EMC) generic immunity standard.
Part 1: Residential, commercial and light industry environment".
- CFR-47: FCC Rules and Regulations:
Part 15: "Radio frequency devices
Subpart B – Unintentional radiators"

CAUTION!

- ☒ Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- ☒ Use the supplied DC power supply to feed power to the machine.
- ☒ Please use recommended interconnection cables to connect the machine to other components.



For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com.

**Updates to this user manual may be found at
<http://www.kramerelectronics.com/manuals.html>.**

We welcome your questions, comments and feedback.

Kramer Electronics, Ltd.

3 Am VeOlamo Street. Jerusalem 95463, Israel Tel: (+972-2)-654-4000

Fax: (+972-2)-653-5369, E-mail: info@kramerel.com

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