

# KRAMER



## USER MANUAL

**MODEL:**

**FC-70R**

RS-232 to USB Converter

# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
<b>2</b>	<b>Getting Started</b>	<b>2</b>
2.1	Achieving the Best Performance	2
2.2	Safety Instructions	2
2.3	Recycling Kramer Products	3
<b>3</b>	<b>Overview</b>	<b>4</b>
3.1	Defining the FC-70R RS-232 to USB Converter	5
<b>4</b>	<b>Connecting the FC-70R</b>	<b>6</b>
<b>5</b>	<b>Recommended RS-232 Connection Parameters</b>	<b>7</b>
<b>6</b>	<b>FC-70R Commands</b>	<b>8</b>
<b>7</b>	<b>Technical Specifications</b>	<b>13</b>

## Figures

Figure 1: FC-70R RS-232 to USB Converter	5
Figure 2: Connecting the FC-70R RS-232 to USB Converter	6

---

# 1 Introduction

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

Our 1,000-plus different models now appear in 14 groups that are clearly defined by function: GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Routers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Video Products; GROUP 12: Digital Signage; GROUP 13: Audio; and GROUP 14: Collaboration.

Congratulations on purchasing your Kramer **FC-70R** RS-232 to USB Converter. This product is used to control HSL secured products and is ideal for:

- High-security organizations
- Government, military and financial branches
- Any organization that handles sensitive and confidential information

---

## 2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual



Go to [www.kramerav.com/downloads/FC-70R](http://www.kramerav.com/downloads/FC-70R) to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

### 2.1 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Do not secure the cables in tight bundles or roll the slack into tight coils
- Avoid interference from neighbouring electrical appliances that may adversely influence signal quality
- Position your **FC-70R** away from moisture, excessive sunlight and dust



This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.

### 2.2 Safety Instructions



**Caution:** There are no operator serviceable parts inside the unit

**Warning:** Use only the Kramer Electronics power supply that is provided with the unit

**Warning:** Disconnect the power and unplug the unit from the wall before installing

## 2.3 Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer's recycling arrangements in your particular country go to our recycling pages at [www.kramerav.com/support/recycling/](http://www.kramerav.com/support/recycling/).

---

## 3 Overview

**FC-70R** is a protocol translator from RS-232 to USB signals to allow remote control of HSL secure and non-secure products. HSL products are controlled using keyboard, mouse and touch display (KVM combiners). **FC-70R** translates RS-232 control commands to enable remote control on secured KVM and KVM combiners.

The **FC-70R** features:

- Enhanced Usability & Remote Control - Operates with HSL secure KVM, KM and Combiner products.
- Easy and Intuitive User Interface - Graphical user interface when connected to Kramer control.
- Remote Switching - When connected to Kramer Control or Kramer RC devices.
- Standards Compliance - Maintains ELA4+ and PPSV3.0 of HighSecLabs products.
- Connection Ports - Connects to HSL products via the USB port and to an external controller via the RS-232 port.
- USB Powered – Powered from the USB line. No power supply needed.

### 3.1 Defining the FC-70R RS-232 to USB Converter

This section defines the **FC-70R**.

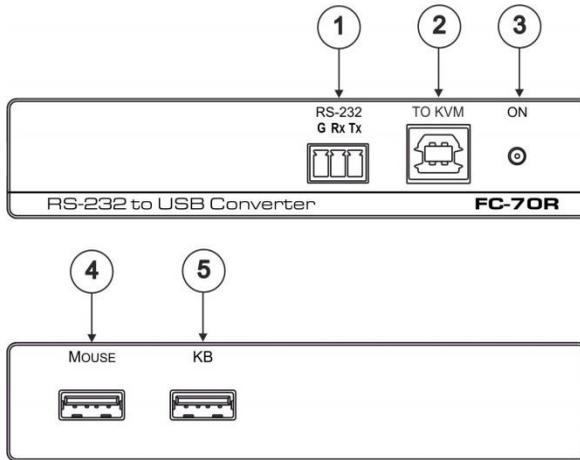


Figure 1: FC-70R RS-232 to USB Converter

#	Feature	Function
1	RS-232 Terminal Block	Connects to a control device
2	USB-B Connector	Connects to a KVM or KVM combiner being controlled
3	ON LED	Lights when the device is powered on
4	MOUSE USB-A Connector	Connects to a USB mouse
5	KB USB-A Connector	Connects to a USB keyboard

## 4 Connecting the FC-70R



Always switch off the power to each device before connecting it to your **FC-70R**. After connecting the devices to your **FC-70R**, connect its power and then switch on the power to each device.

To connect the **FC-70R**, as illustrated in the example in [Figure 2](#), do the following:

1. Connect the USB-B connector on the back of the **FC-70R** to the USB keyboard connection of the KVM or KVM combiner.  
The **FC-70R** receives power over this connection.
2. Using an RS-232 cable, connect a control device (for example, an **SL-1N**) to the RS-232 3-pin terminal block.
3. Connect a keyboard and mouse to the USB-A connectors.

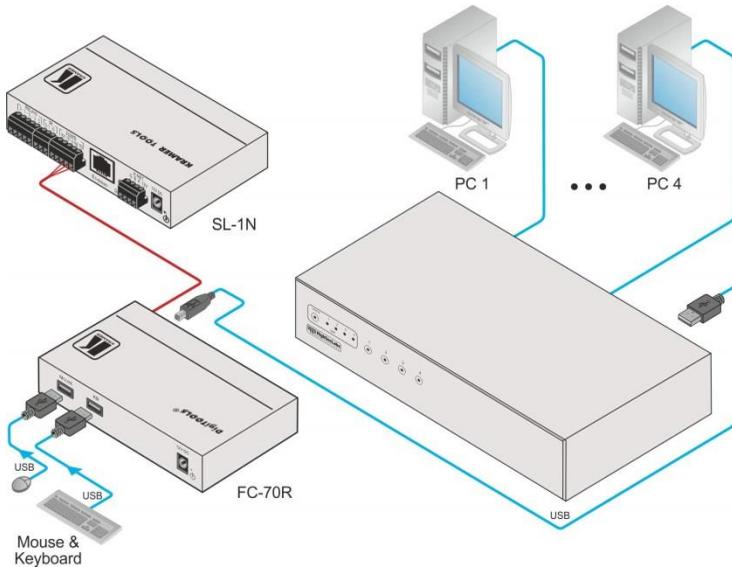


Figure 2: Connecting the FC-70R RS-232 to USB Converter

---

## 5 Recommended RS-232 Connection Parameters

- Speed – 115200bps
- Data bits – 8
- Stop bits – 1
- Parity - None
- Flow Control – None

---

## 6 FC-70R Commands

Every command must start with #.

When a connection is established, send the first command "#ANATF 1" to reset the translator.

Every KB command to an HSL device starts with one of the following commands:

#ANATR – R CTRL | R CTRL

#ANATL – L CTRL | L CTRL

#ANATR F11 – R CTRL | R CTRL | F11 |

#ANATL F11 – L CTRL | L CTRL | F11 |

This is followed by a letter or a number in HEX based on the below table:

Command	Hex Code
#define KEY_NONE	00
#define KEY_A	04
#define KEY_B	05
#define KEY_C	06
#define KEY_D	07
#define KEY_E	08
#define KEY_F	09
#define KEY_G	0A
#define KEY_H	0B
#define KEY_I	0C
#define KEY_J	0D
#define KEY_K	0E
#define KEY_L	0F
#define KEY_M	10
#define KEY_N	11
#define KEY_O	12
#define KEY_P	13
#define KEY_Q	14
#define KEY_R	15
#define KEY_S	16
#define KEY_T	17
#define KEY_U	18
#define KEY_V	19
#define KEY_W	1A
#define KEY_X	1B
#define KEY_Y	1C

Command	Hex Code
#define KEY_Z	1D
#define KEY_1	1E
#define KEY_2	1F
#define KEY_3	20
#define KEY_4	21
#define KEY_5	22
#define KEY_6	23
#define KEY_7	24
#define KEY_8	25
#define KEY_9	26
#define KEY_0	27
#define KEY_RETURN	28
#define KEY_ESCAPE	29
#define KEY_BACKSPACE	2A
#define KEY_TAB	2B
#define KEY_SPACE	2C
#define KEY_MINUS	2D
#define KEY_EQUAL	2E
#define KEY_BRACKET_LEFT	2F
#define KEY_BRACKET_RIGHT	30
#define KEY_BACKSLASH	31
#define KEY_EUROPE_1	32
#define KEY_SEMICOLON	33
#define KEY_APOSTROPHE	34
#define KEY_GRAVE	35
#define KEY_COMMA	36
#define KEY_PERIOD	37
#define KEY_SLASH	38
#define KEY_CAPS_LOCK	39
#define KEY_F1	3A
#define KEY_F2	3B
#define KEY_F3	3C
#define KEY_F4	3D
#define KEY_F5	3E
#define KEY_F6	3F
#define KEY_F7	40
#define KEY_F8	41
#define KEY_F9	42
#define KEY_F10	43
#define KEY_F11	44
#define KEY_F12	45
#define KEY_PRINT_SCREEN	46
#define KEY_SCROLL_LOCK	47
#define KEY_PAUSE	48
#define KEY_INSERT	49

Command	Hex Code
#define KEY_HOME	4A
#define KEY_PAGE_UP	4B
#define KEY_DELETE	4C
#define KEY_END	4D
#define KEY_PAGE_DOWN	4E
#define KEY_ARROW_RIGHT	4F
#define KEY_ARROW_LEFT	50
#define KEY_ARROW_DOWN	51
#define KEY_ARROW_UP	52
#define KEY_NUM_LOCK	53
#define KEY_KEYPAD_DIVIDE	54
#define KEY_KEYPAD_MULTIPLY	55
#define KEY_KEYPAD_SUBTRACT	56
#define KEY_KEYPAD_ADD	57
#define KEY_KEYPAD_ENTER	58
#define KEY_KEYPAD_1	59
#define KEY_KEYPAD_2	5A
#define KEY_KEYPAD_3	5B
#define KEY_KEYPAD_4	5C
#define KEY_KEYPAD_5	5D
#define KEY_KEYPAD_6	5E
#define KEY_KEYPAD_7	5F
#define KEY_KEYPAD_8	60
#define KEY_KEYPAD_9	61
#define KEY_KEYPAD_0	62
#define KEY_KEYPAD_DECIMAL	63
#define KEY_EUROPE_2	64
#define KEY_APPLICATION	65
#define KEY_POWER	66
#define KEY_KEYPAD_EQUAL	67
#define KEY_F13	68
#define KEY_F14	69
#define KEY_F15	6A
#define KEY_CONTROL_LEFT	E0
#define KEY_SHIFT_LEFT	E1
#define KEY_ALT_LEFT	E2
#define KEY_GUI_LEFT	E3
#define KEY_CONTROL_RIGHT	E4
#define KEY_SHIFT_RIGHT	E5
#define KEY_ALT_RIGHT	E6
#define KEY_GUI_RIGHT	E7

For example, to go full screen on channel 1 while using a K424F combiner, send the following command:

#ANATL 1E – select channel 1.

#ANATL 09 – Full screen on channel 1.

The following table lists optional commands that can be sent to the combiner and KVM switcher:

KB Hotkey		Description	Translator Code	
L CTRL   L CTRL	1	Switch to channel 1	#ANATL	1E
L CTRL   L CTRL	2	Switch to channel 2	#ANATL	1F
L CTRL   L CTRL	3	Switch to channel 3	#ANATL	20
L CTRL   L CTRL	4	Switch to channel 4	#ANATL	21
L CTRL   L CTRL	5	Switch to channel 5	#ANATL	22
L CTRL   L CTRL	6	Switch to channel 6	#ANATL	23
L CTRL   L CTRL	7	Switch to channel 7	#ANATL	24
L CTRL   L CTRL	8	Switch to channel 8	#ANATL	25
L CTRL   L CTRL	F1	Load preset #1	#ANATL	3A
L CTRL   L CTRL	F2	Load preset #2	#ANATL	3B
L CTRL   L CTRL	F3	Load preset #3	#ANATL	3C
L CTRL   L CTRL	F4	Load preset #4 (tile button preset)	#ANATL	3D
L CTRL   L CTRL	F5		#ANATL	3E
L CTRL   L CTRL	F6		#ANATL	3F
L CTRL   L CTRL	F11 B	Set relative mouse mode	#ANATL F11	05
L CTRL   L CTRL	F11 C	Reset relative mouse mode	#ANATL F11	06
L CTRL   L CTRL	F11 M	Toggle dual-mouse-mode option	#ANATL F11	10
L CTRL   L CTRL	F11 I	Toggle left/right control key	#ANATL F11	0C
L CTRL   L CTRL	F11 E	Toggle enable/disable-external-switching option	#ANATL F11	08
L CTRL   L CTRL	F11 H	Toggle enable/disable-cursor-parking option	#ANATL F11	0B
L CTRL   L CTRL	F11 R	Reset to factory defaults	#ANATL F11	15
L CTRL   L CTRL	U	User mode	#ANATL	18
L CTRL   L CTRL	F11 F [1..6]	Toggle freeze-channel-layer option	#ANATL F11	09 (1E, 1F, 20, 21, 22, 23)
L CTRL   L CTRL	F11 F R	Unfreeze all channel layers	#ANATL F11	09 15
L CTRL   L CTRL	F11 L	Toggle cloning video output (Note 1)	#ANATL F11	0F
L CTRL   L CTRL	F11 {J,K}{J,K}	Output source configuration (Note 2)	#ANATL F11	0D, 0E
L CTRL   L CTRL	-	Decrease window scaling by one	#ANATL	2D
L CTRL   L CTRL	+	Increase window scaling by one	#ANATL	2E
L CTRL   L CTRL	Y	Auto scale window exactly - not keeping aspect ratio	#ANATL	1C
L CTRL   L CTRL	W	Auto scale window according to its least dimension	#ANATL	1A
L CTRL   L CTRL	F	Maximize window	#ANATL	09
L CTRL   L CTRL	Z	Undo maximize - accepted only immediately after	#ANATL	1D

KB Hotkey		Description	Translator Code	
L CTRL   L CTRL	<b>Q</b>	Quad tile windows	#ANATL	14
L CTRL   L CTRL	<b>U</b>	Enter user mode	#ANATL	18
L CTRL   L CTRL	<b>O</b>	Enter system mode	#ANATL	12
L CTRL   L CTRL	<b>S</b>	Enter scale mode	#ANATL	16

Note 1: Active only in **single** background size mode with dual display HW

Note 2: Active only in **double** background size mode with dual display HW

---

## 7 Technical Specifications

PORTS:	1 RS-232 on a 3-pin terminal block, 1 KVM on a USB type-B connector, 2 USB type-A connectors for mouse and keyboard
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
POWER CONSUMPTION:	12V DC, 110mA max.
DIMENSIONS:	12cm x 7.15cm x 2.44cm (4.7" x 2.8" x 1.0") W, D, H
WEIGHT:	0.14kg (0.3lbs) approx.
SHIPPING DIMENSIONS:	15.7cm x 12cm x 8.7cm (6.2" x 4.7" x 3.4") W, D, H.
SHIPPING WEIGHT:	0.55kg (1.21lbs) approx.
INCLUDED ACCESSORIES:	Power supply
OPTIONS:	RK-3T rack adapter
Specifications are subject to change without notice For the most updated specifications, go to our Web site at <a href="http://www.kramerav.com">www.kramerav.com</a>	

## 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 attended 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](http://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

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS LIMITED WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF KRAMER ELECTRONICS CANNOT LAWFULLY DISCLAIM OR EXCLUDE IMPLIED WARRANTIES UNDER APPLICABLE LAW, THEN ALL IMPLIED WARRANTIES COVERING THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY TO THIS PRODUCT AS PROVIDED UNDER APPLICABLE LAW.

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 APPLICABLE 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](http://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.

# KRAMER



## SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing

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

We welcome your questions, comments, and feedback.

[www.kramerAV.com](http://www.kramerAV.com)  
[info@kramerel.com](mailto:info@kramerel.com)