

Kramer Electronics, Ltd.



USER MANUAL

Models:

FC-47, HDMI to DVI/ Audio Converter

FC-48, DVI/ Audio to HDMI Converter

Contents

1	Introduction	1
2	Getting Started	1
2.1	Quick Start	2
3	Overview	3
3.1	FC-47 / FC-48 Input/Output Resolutions	4
4	Your FC-47 HDMI to DVI/ Audio Converter	5
4.1	Connecting the FC-47 HDMI to DVI/ Audio Converter	6
5	Your FC-48 DVI/ Audio to HDMI Converter	7
5.1	Connecting the FC-48 DVI/ Audio to HDMI Converter	8
6	Technical Specifications	9

Figures

Figure 1: FC-47 HDMI to DVI/ Audio Converter	5
Figure 2: Connecting the FC-47 HDMI to DVI/ Audio Converter	6
Figure 3: FC-48 DVI/ Audio to HDMI Converter	7
Figure 4: Connecting the FC-48 DVI/ Audio to HDMI Converter	8

Tables

Table 1: FC-47 PC Input/Output Resolutions	4
Table 2: FC-47 HD Input/Output Resolutions	4
Table 3: FC-48 PC Input/Output Resolutions	4
Table 4: FC-48 HDTV Input/Output Resolutions	4
Table 5: FC-47 HDMI to DVI/ Audio Converter Features	5
Table 6: FC-48 DVI/ Audio to HDMI Converter Features	7
Table 7: Technical Specifications of the FC-47 HDMI to DVI/ Audio Converter	9
Table 8: Technical Specifications of the FC-48 DVI/ Audio to HDMI Converter	9

1 Introduction

Welcome to Kramer Electronics (since 1981): a world of unique, creative and affordable solutions to the infinite range of problems that confront the video, audio and presentation professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 500-plus different models now appear in 8 Groups¹, which are clearly defined by function. Congratulations on purchasing your Kramer TOOLS **FC-47 HDMI² to DVI/ Audio Converter** and/or Kramer TOOLS **FC-47 HDMI² to DVI/ Audio Converter**. The **FC-47** and **FC-48** are ideal for:

- Home theater, presentation and multimedia applications
- Rental and staging

The package includes the following items:

- **FC-47** or **FC-48**
- Power adapter (12V DC Input)
- This user manual³

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 cables⁴



Caution – No operator-serviceable parts inside unit.

Warning – Use only the Kramer Electronics input power wall adapter that is provided with this unit¹.

Warning – Disconnect power and unplug unit from wall before installing or removing device or servicing unit.

1 GROUP 1: Distribution Amplifiers; GROUP 2: Video and Audio Switchers, Matrix Switchers and Controllers; GROUP 3: Video, Audio, VGA/XGA Processors; GROUP 4: Interfaces and Sync Processors; GROUP 5: Twisted Pair Interfaces; GROUP 6: Accessories and Rack Adapters; GROUP 7: Scan Converters and Sealers; and GROUP 8: Cables and Connectors
2 High-Definition Multimedia Interface

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

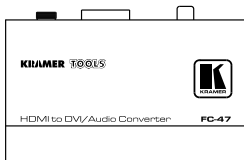
4 The complete list of Kramer cables is on our Web site at <http://www.kramerelectronics.com>

2.1 Quick Start

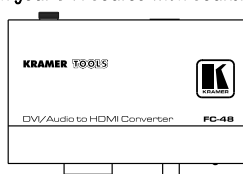
This quick start chart summarizes the basic setup and operation steps.

Step 1: Your FC-47 and FC-48 - see sections 4 and 5

The FC-47 HDMI to DVI/ Audio Converter lets you connect your HDMI source to a DVI display and enjoy high quality digital audio at the same time.



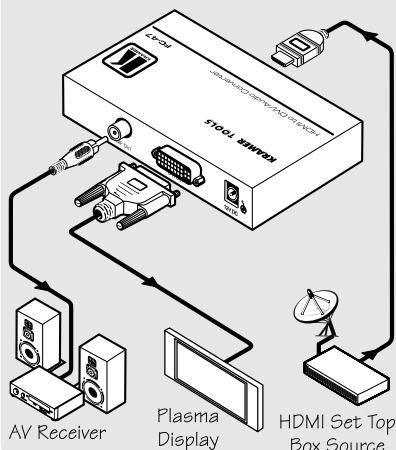
The FC-48 DVI/ Audio to HDMI Converter adds HDMI output capability to your DVI source so that, for example, a new HDMI television can be used with your DVI source with sound.



Step 2: Connect the inputs/outputs - see sections 4.1 and 5.1

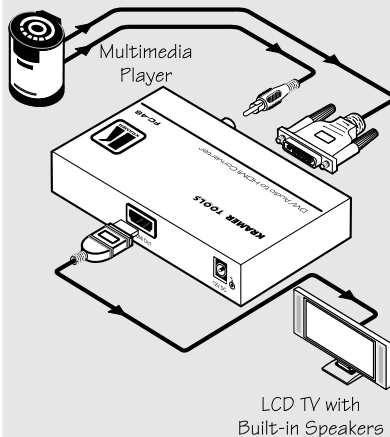
On the FC-47, connect:

- An HDMI Set Top Box to the HDMI input
- The DVI output to a Plasma display and the S/PDIF output to an AV Receiver



On the FC-48, connect:

- A Multimedia Player to the DVI IN connector and to the S/PDIF RCA IN connector
- The HDMI output to a LCD TV with built-in speakers



Step 3: Connect the power

1 For example: model number AD2512C, part number 2535-000251

3 Overview

High-Definition Multimedia Interface (HDMI) is an uncompressed all-digital¹ audio/video interface, widely supported in the entertainment and home cinema industry. It delivers the highest high-definition image and sound quality. Note that Kramer Electronics Limited is an HDMI Adopter² and an HDCP Licensee³. In particular, HDMI:

- Provides a simple⁴ interface between any audio/video source, such as a set-top box, DVD player, or A/V receiver and video monitor, such as a digital flat LCD / plasma television (DTV), over a single lengthy⁵ cable
- Supports standard, enhanced, high-definition video, and multi-channel digital audio⁶ on a single cable
- Transmits all ATSC HDTV standards and supports 8-channel digital audio, with bandwidth to spare to accommodate future enhancements and requirements
- Benefits consumers by providing superior, uncompressed digital video quality via a single cable⁷, and user-friendly connector
- Is backward-compatible with DVI (Digital Visual Interface)
- Supports two-way communication between the video source (such as a DVD player) and the digital television, enabling new functionality such as automatic configuration and one-button play

HDMI has the capacity to support existing high-definition video formats (720p, 1080i, and 1080p/60), as well as standard definition formats such as NTSC or PAL.

Achieving the best performance means:

- 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)
- Avoiding interference from neighboring electrical appliances that may adversely influence signal quality and positioning your **FC-47** and/or **FC-48** in a location free from moisture and away from excessive sunlight and dust

1 Ensuring an all-digital rendering of video without the losses associated with analog interfaces and their unnecessary digital-to-analog conversions

2 See http://www.hdmi.org/about/adopters_founders.asp

3 See <http://www.digital-cp.com/list/>

4 With video and multi-channel audio combined into a single cable, the cost, complexity, and confusion of multiple cables currently used in A/V systems is reduced

5 HDMI technology has been designed to use standard copper cable construction at up to 15m

6 HDMI supports multiple audio formats, from standard stereo to multi-channel surround-sound. HDMI has the capacity to support Dolby 5.1 audio and high-resolution audio formats

7 HDMI provides the quality and functionality of a digital interface while also supporting uncompressed video formats in a simple, cost-effective manner

3.1 FC-47 / FC-48 Input/Output Resolutions

This section describes the:

- **FC-47** PC input/output resolutions, see Table 1
- **FC-47** HD input/output resolutions, see Table 2
- **FC-48** PC input/output resolutions, see Table 3
- **FC-48** HDTV input/output resolutions, see Table 4

Table 1: FC-47 PC Input/Output Resolutions

VGA ¹ @60Hz	VGA ¹ @72Hz	VGA ¹ @75Hz	VGA ¹ @85Hz
SVGA ² @60Hz	SVGA ² @72Hz	SVGA ² @75Hz	SVGA ² @85Hz
XGA ³ @60Hz	XGA ³ @70Hz	XGA ³ @75Hz	XGA ³ @85Hz
XGA ³ @87Hz	SXGA ⁴ @60Hz	SXGA ⁴ @75Hz	SXGA ⁴ @85Hz
UXGA ⁵ @60Hz	1152@70Hz	1152@75Hz	1152@85Hz

Table 2: FC-47 HD Input/Output Resolutions

480i@60Hz	576i@50Hz	480P@60Hz	576P@50Hz	720P@60Hz
720P@50Hz	1080i@60Hz	1080i@50Hz	1080P@60Hz	1080P@50Hz
1080P@30Hz	1080P@25Hz	1080P@24Hz		

Table 3: FC-48 PC Input/Output Resolutions

VGA ¹ @60Hz	VGA ¹ @72Hz	VGA ¹ @75Hz	VGA ¹ @85Hz
SVGA ² @60Hz	SVGA ² @72Hz	SVGA ² @75Hz	SVGA ² @85Hz
XGA ³ @60Hz	XGA ³ @70Hz	XGA ³ @75Hz	XGA ³ @85Hz
XGA ³ @87Hz	SXGA ⁴ @60Hz	SXGA ⁴ @75Hz	SXGA ⁴ @85Hz
UXGA ⁵ @60Hz	1152@70Hz	1152@75Hz	1152@85Hz

Table 4: FC-48 HDTV Input/Output Resolutions

480P@60Hz	576P@50Hz	720P@50Hz	720P@60Hz	1080i@50Hz
1080i@60Hz	1080P@60Hz	1080P@50Hz	1080P@30Hz	1080P@25Hz
1080P@24Hz				

1 640x480
 2 800x600
 3 1024x768
 4 1280x1024
 5 1600x1200

4 Your FC-47 HDMI to DVI/ Audio Converter

The high quality **FC-47 HDMI to DVI/ Audio Converter** accepts an HDMI input and converts the HDMI signal to a digital video DVI (DVI-D) output and a digital audio S/PDIF output. In particular, the **FC-47**:

- Lets you connect your HDMI source to a DVI HDCP display and enjoy high quality digital audio at the same time (note that when the HDMI input is HDCP encrypted the DVI output is encrypted as well)
- Features input format auto detection: digital RGB or YPbPr
- Supports an operation frequency of up to 1.65Gbps
- Is 12VDC fed
- Is HDCP compliant
- Is Plug and Play

Figure 1 and Table 5 define the **FC-47 HDMI to DVI/ Audio Converter**:

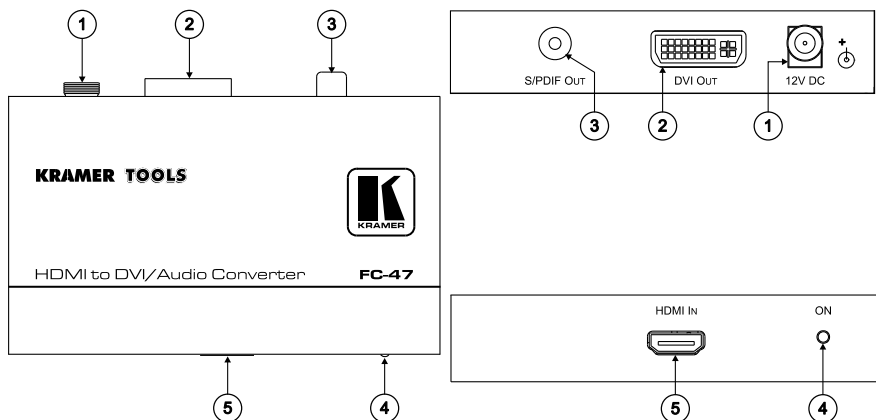


Figure 1: FC-47 HDMI to DVI/ Audio Converter

Table 5: FC-47 HDMI to DVI/ Audio Converter Features

#	Feature	Function
1	12V DC	+12V DC connector for powering the unit
2	DVI OUT Connector	Connects to the DVI acceptor
3	S/PDIF OUT RCA Connector	Connects to the digital audio acceptor
4	ON LED	Illuminates when receiving power
5	HDMI IN Connector	Connects to the HDMI source

4.1 Connecting the FC-47 HDMI to DVI/ Audio Converter

To connect the **FC-47**, as the example in Figure 2 shows, do the following¹:

1. Connect the DVI OUT connector to the DVI acceptor (for example, a plasma display).
2. Connect the S/PDIF RCA OUT connector to the digital audio acceptor (for example, an AV receiver).
3. Connect the HDMI source (for example, an HDMI set top box) to the HDMI IN connector.
4. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity.

Note that only the digital signal (DVI-D) is available on the DVI connector.

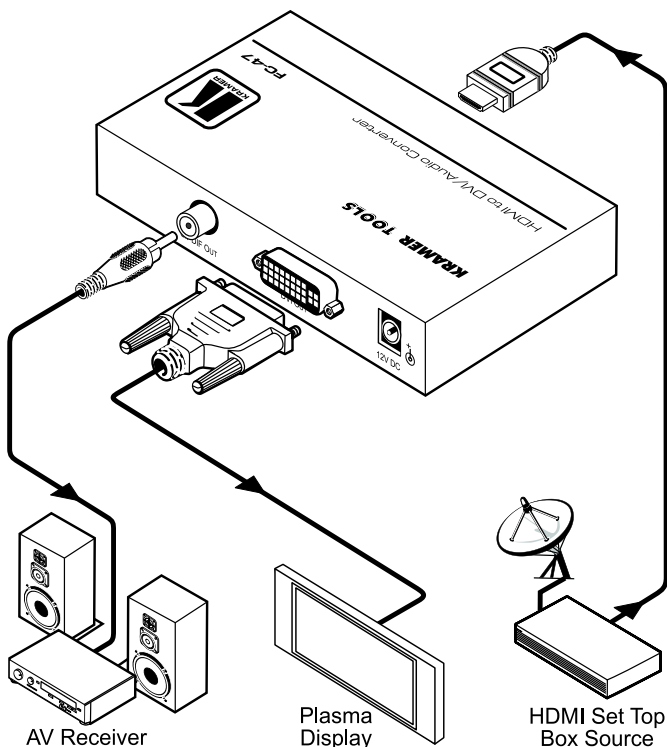


Figure 2: Connecting the FC-47 HDMI to DVI/ Audio Converter

¹ Switch OFF the power on each device before connecting it to your FC-47. After connecting your FC-47, switch on its power and then switch on the power on each device

5 Your FC-48 DVI/ Audio to HDMI Converter

The high quality **FC-48 DVI/ Audio to HDMI Converter** accepts a DVI input and an S/PDIF input, and combines both these digital A/V signals into an HDMI output. In particular, the **FC-48**:

- Adds HDMI output capability to your DVI source so that, for example, an HDMI television can be used with your DVI source with sound
- Supports an operation frequency of up to 1.65Gbps per graphic channel
- Features input format auto detection: digital RGB or YPbPr
- Is 12VDC fed
- HDCP compliant
- Is Plug and Play

Figure 3 and Table 6 define the **FC-48 DVI/ Audio to HDMI Converter**:

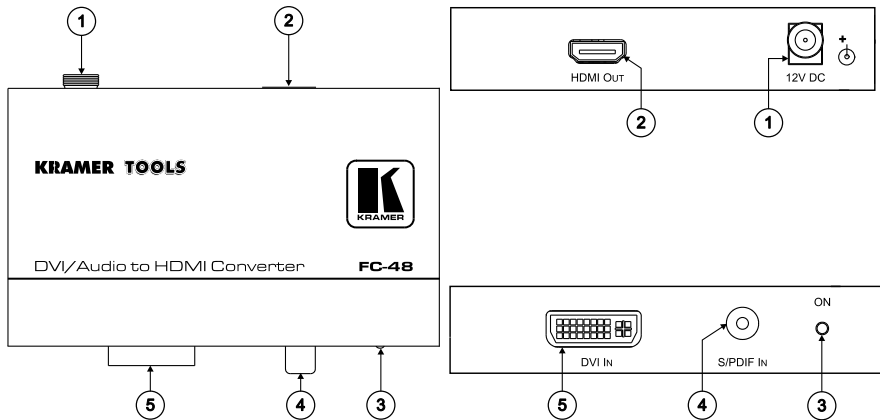


Figure 3: FC-48 DVI/ Audio to HDMI Converter

Table 6: FC-48 DVI/ Audio to HDMI Converter Features

#	Feature	Function
1	12V DC	+12V DC connector for powering the unit
2	HDMI OUT Connector	Connects to the HDMI acceptor
3	ON LED	Illuminates when receiving power
4	S/PDIF IN RCA Connector	Connects to the digital audio source
5	DVI IN Connector	Connects to the DVI source

5.1 Connecting the FC-48 DVI/ Audio to HDMI Converter

To connect the **FC-48**, as the example in Figure 4 shows, do the following¹:

1. Connect the HDMI OUT connector to the HDMI acceptor (for example, an LCD TV with built-in speakers).
2. Connect the DVI source (for example, a multimedia player) to the:
 - DVI IN connector
 - S/PDIF (digital audio) RCA IN connector
3. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity.

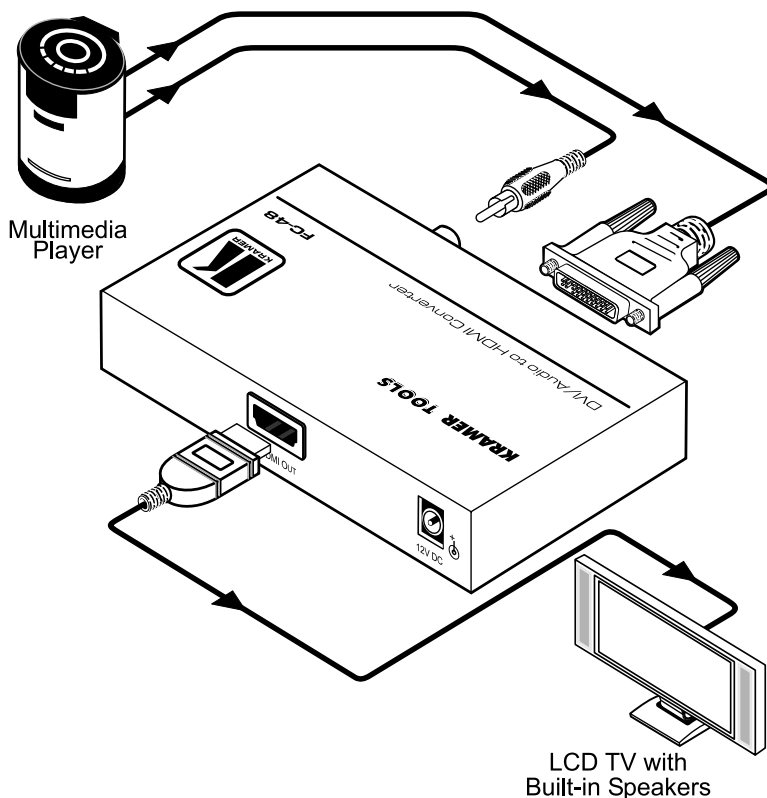


Figure 4: Connecting the FC-48 DVI/ Audio to HDMI Converter

¹ Switch OFF the power on each device before connecting it to your FC-48. After connecting your FC-48, switch on its power and then switch on the power on each device

6 Technical Specifications¹

Table 7 and Table 8 define the technical specifications:

Table 7: Technical Specifications of the FC-47 HDMI to DVI/ Audio Converter

INPUT:	HDMI Connector
OUTPUTS:	1 DVI ² , 1.2Vpp on a DVI Molex 24pin female connector; DDC signal 5Vpp (TTL) 1 S/PDIF (digital audio) on an RCA connector
OPERATION FREQUENCY:	Supports up to 1.65Gbps
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI 1.1, HDCP ³ 1.0
INDICATOR LED:	ON
POWER SOURCE:	12 VDC 180mA
DIMENSIONS:	12cm x 7.2cm x 2.4cm (4.73" x 2.83" 0.95", W, D, H)
WEIGHT:	0.3 kg. (0.67 lbs.) approx.
ACCESSORIES:	Power supply, bracket installation kit
OPTIONS:	Kramer cables

Table 8: Technical Specifications of the FC-48 DVI/ Audio to HDMI Converter

INPUTS:	1 DVI ² , 1.2Vpp on a DVI Molex 24pin female connector; DDC signal 5Vpp (TTL) 1 S/PDIF (digital audio) on an RCA connector
OUTPUT:	HDMI Connector
OPERATION FREQUENCY:	Supports up to 1.65Gbps
COMPLIANCE WITH HDMI STANDARD:	Supports DVI 1.0, HDMI 1.1, and HDCP ³ 1.0
INDICATOR LED:	ON
POWER SOURCE:	12 VDC 190mA
DIMENSIONS:	12cm x 7.2cm x 2.4cm (4.73" x 2.83" 0.95", W, D, H)
WEIGHT:	0.3 kg. (0.67 lbs.) approx.
ACCESSORIES:	Power supply, bracket installation kit
OPTIONS:	Kramer cables

¹ Specifications are subject to change without notice

² On a DVI-I connector. Note that only the digital signal (DVI-D) is available on the DVI connector

³ Compliant with HDCP 1.1 and downward compatible with HDCP 1.0

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 seven 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, where updates to this user manual may be found. We welcome your questions, comments and feedback.



Caution

Safety Warning:

Disconnect the unit from the power supply before opening/servicing.



Kramer Electronics, Ltd.

Web site: www.kramerelectronics.com

E-mail: info@kramerelectronics.com

P/N: 2900-000238 REV 1