Kramer Electronics, Ltd.

USER MANUAL

Model:

FC-31xl

UXGA to DVI Converter

Contents

Figures

Tables

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 the video, audio, presentation, and broadcasting professional 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[1] that are clearly defined by function.

Congratulations on purchasing your Kramer MultiTOOLS® **FC-31xl** *UXGA to DVI Converter*, which is ideal for:

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

The package includes the following items:

- **FC-31xl** *UXGA to DVI Converter*
- Power adapter (12V DC output)
- This user manual[2]

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[3]

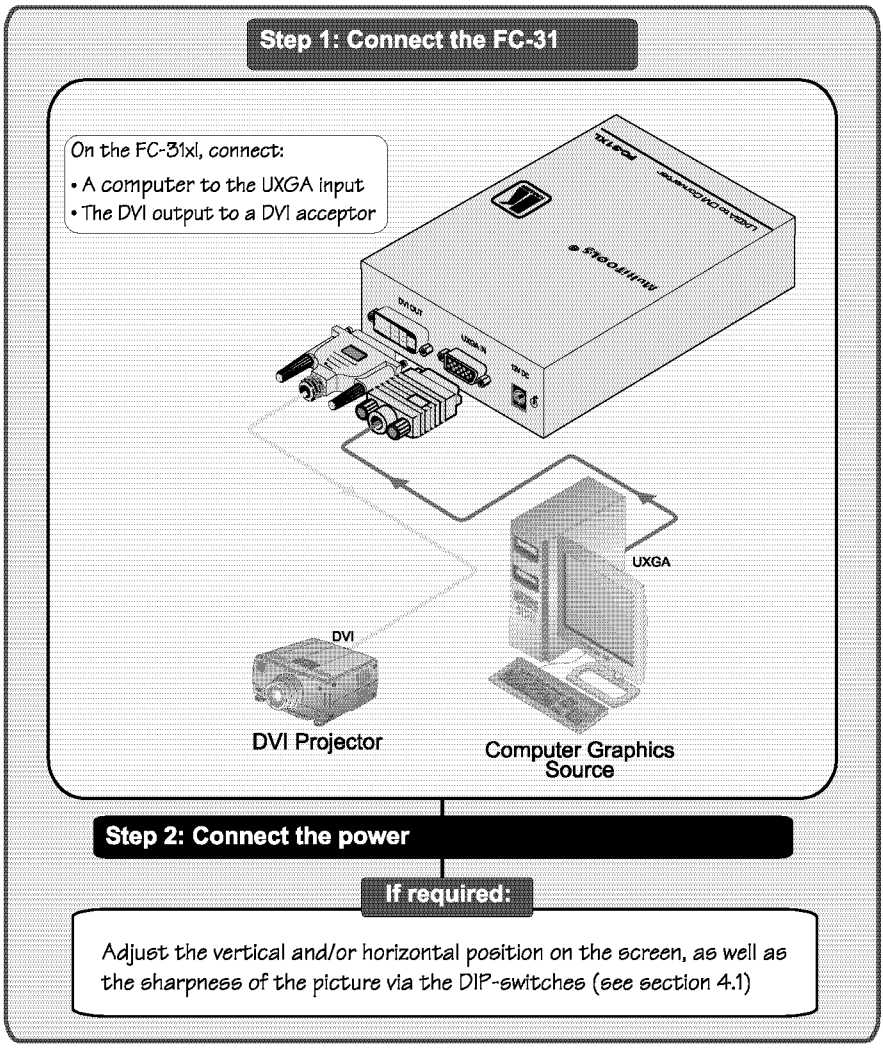
1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

2 Download up-to-date Kramer user manuals from http://www.kramerelectronics.com

3 The complete list of Kramer cables is available from http://www.kramerelectronics.com

2.1 Quick Start

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



3 Overview

The Kramer MultiTOOLS® **FC-31xl** *UXGA to DVI Converter* is a high quality converter for converting an analog computer graphics signal on a 15-pin HD connector to a digital DVI-D signal.

Table 1 lists the resolutions supported by the **FC-31xl.**

Table 1: FC-31xl Resolutions

Resolution	Frequency [Hz]
640x480	60, 72, 75, 85
720x400	70, 85
800x600	56, 60, 72, 75, 85
848x480	60
1024x768	60, 72, 75, 85
1152x864	75
1280x768	60 (RB[1]), 75, 85
1280x800	60
1280x960	60, 85

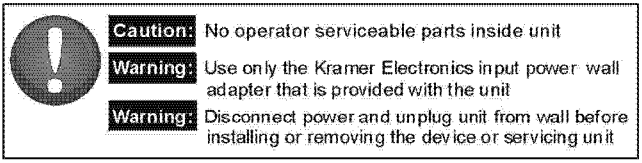
Resolution	Frequency [Hz]
1280x1024	60, 75, 85
1360x768	60
1400x1050	60 (RB), 75
1440x900	60
1440x1050	60
1600x1200	60
1680x1050	60
1920x1080	60
1920x1200	60 (RB)

In particular, the **FC-31xl**:

- Includes DIP-switches that let you adjust the horizontal position, the vertical position, and/or the sharpness of the image
- Is 12V DC fed

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 and positioning your FC-31xl away from moisture, excessive sunlight and dust



1 Reduced blanking

4 Your FC-31xl UXGA to DVI Converter

Figure 1 and Table 2 define the **FC-31xl**.

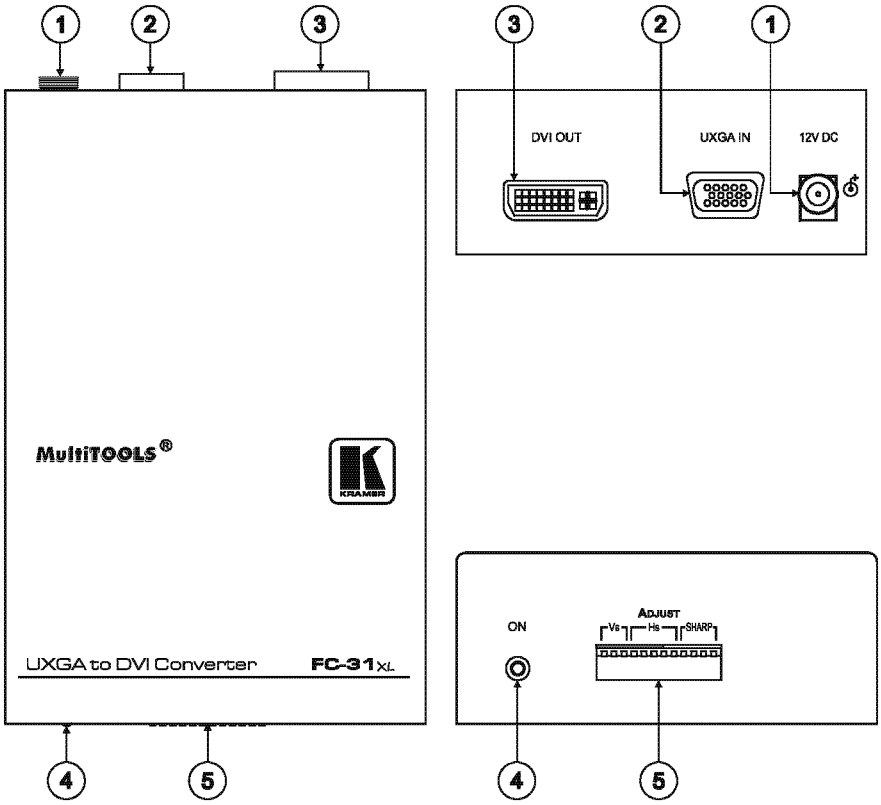


Figure 1: FC-31xl UXGA to DVI Converter

Table 2: FC-31xl UXGA to DVI Converter Features

#	Feature	Function
1	*12V DC*	+12V DC connector for powering the unit
2	*UXGA IN* 15-pin HD Connector	Connects to the computer graphics source
3	*DVI OUT* Connector	Connects to the DVI acceptor
4	*ON* LED	Illuminates when receiving power
5	*ADJUST* DIP-switches	Set to adjust the vertical and/or horizontal position on the screen, and/or the sharpness of the picture (see Section 4.1)

4.1 DIP-switch Settings

Figure 2 and Table 3 define the DIP-switches.

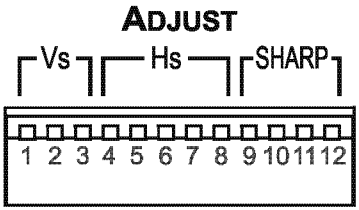


Figure 2: DIP-switch Definitions

Table 3: DIP-switch Definitions

DIP-switches	Set to adjust the:
1 to 3	(Vs) Vertical position on the screen
4 to 8	(Hs) Horizontal position on the screen
9 to 12	(SHARP) Sharpness of the picture

To adjust the vertical position of the image, set the DIP-switches as required, according to Table 4.

Table 4: (Vs) Vertical Positioning DIP-switch Settings

In this state:	1	2	3
Shift Down (4 steps)	OFF	OFF	OFF
Shift Down (3 steps)	ON	OFF	OFF
Shift Down (2 steps)	OFF	ON	OFF
Shift Down (1 step)	ON	ON	OFF
No shift	OFF	OFF	ON
Shift Up (1 step)	ON	OFF	ON
Shift Up (2 steps)	OFF	ON	ON
Shift Up (3 steps)	ON	ON	ON

To adjust the horizontal position of the image, set the DIP-switches as required, according to Table 5.

Table 5: (Hs) Horizontal Positioning DIP-switch Settings

In this state:	4	5	6	7	8
Shift Left (16 steps)	OFF	OFF	OFF	OFF	OFF
Shift Left (15 steps)	ON	OFF	OFF	OFF	OFF
Shift Left (14 steps)	OFF	ON	OFF	OFF	OFF
Shift Left (13 steps)	ON	ON	OFF	OFF	OFF
Shift Left (12 steps)	OFF	OFF	ON	OFF	OFF
Shift Left (11 steps)	ON	OFF	ON	OFF	OFF
Shift Left (10 steps)	OFF	ON	ON	OFF	OFF
Shift Left (9 steps)	ON	ON	ON	OFF	OFF
Shift Left (8 steps)	OFF	OFF	OFF	ON	OFF

In this state:	4	5	6	7	8
No Shift	OFF	OFF	OFF	OFF	ON
Shift Right (1 step)	ON	OFF	OFF	OFF	ON
Shift Right (2 steps)	OFF	ON	OFF	OFF	ON
Shift Right (3 steps)	ON	ON	OFF	OFF	ON
Shift Right (4 steps)	OFF	OFF	ON	OFF	ON
Shift Right (5 steps)	ON	OFF	ON	OFF	ON
Shift Right (6 steps)	OFF	ON	ON	OFF	ON
Shift Right (7 steps)	ON	ON	ON	OFF	ON
Shift Right (8 steps)	OFF	OFF	OFF	ON	ON

In this state:	4	5	6	7	8
Shift Left (7 steps)	ON	OFF	OFF	ON	OFF
Shift Left (6 steps)	OFF	ON	OFF	ON	OFF
Shift Left (5 steps)	ON	ON	OFF	ON	OFF
Shift Left (4 steps)	OFF	OFF	ON	ON	OFF
Shift Left (3 steps)	ON	OFF	ON	ON	OFF
Shift Left (2 steps)	OFF	ON	ON	ON	OFF
Shift Left (1 step)	ON	ON	ON	ON	OFF

In this state:	4	5	6	7	8
Shift Right (9 steps)	ON	OFF	OFF	ON	ON
Shift Right (10 steps)	OFF	ON	OFF	ON	ON
Shift Right (11 steps)	ON	ON	OFF	ON	ON
Shift Right (12 steps)	OFF	OFF	ON	ON	ON
Shift Right (13 steps)	ON	OFF	ON	ON	ON
Shift Right (14 steps)	OFF	ON	ON	ON	ON
Shift Right (15 steps)	ON	ON	ON	ON	ON

The SHARPNESS DIP-switch setting controls the phase of the sampling clock, as defined in Table 6.

Table 6: SHARPNESS DIP-switch Settings

9	11	10	12
OFF	OFF	OFF	OFF
ON	OFF	OFF	OFF
OFF	ON	OFF	OFF
ON	ON	OFF	OFF
OFF	OFF	ON	OFF
ON	OFF	ON	OFF
OFF	ON	ON	OFF
ON	ON	ON	OFF
OFF	OFF	OFF	ON
ON	OFF	OFF	ON
OFF	ON	OFF	ON
ON	ON	OFF	ON
OFF	OFF	ON	ON
ON	OFF	ON	ON
OFF	ON	ON	ON
ON	ON	ON	ON

5 Connecting the FC-31xl UXGA to DVI Converter

To connect your **FC-31xl** *UXGA to DVI Converter*, as the example in Figure 3 illustrates, do the following[1]:

1. Connect a computer graphics source (for example, a computer) to the UXGA IN connector.
2. Connect the DVI OUT connector to a DVI projector.
3. Connect the 12V DC power adapter (wall transformer) to the 12V DC socket and connect the transformer to the mains electricity (not shown in Figure 3).

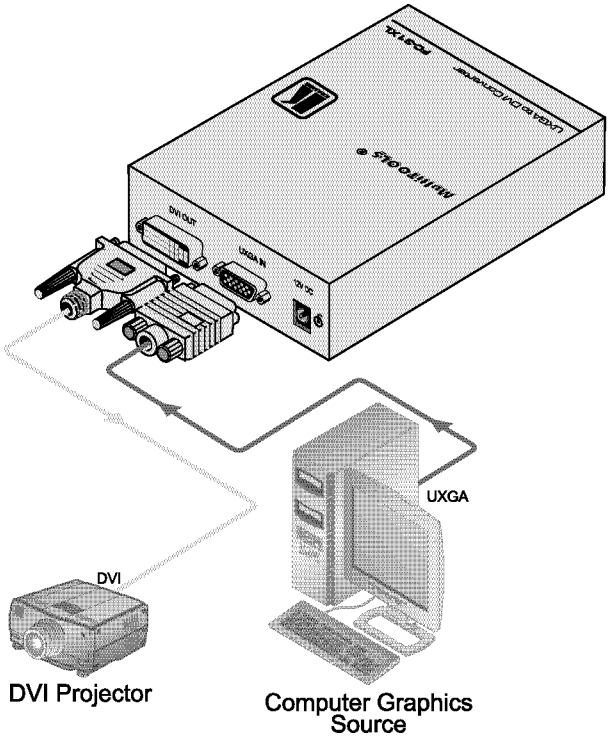


Figure 3: Connecting the FC-31xl UXGA to DVI Converter

6 EDID

The **FC-31xl** is shipped with a fixed, factory default EDID (see Section 8).

1 Switch off the power on each device before connecting it to your FC-31xl. After powering up your FC-31xl, switch on the power on each device

7 Technical Specifications

Table 7 lists the technical specifications of the **FC-31xl**.

Table 7: Technical Specifications[1] of the FC-31xl UXGA to DVI Converter

INPUT:	1 UXGA on a 15-pin HD connector
OUTPUT:	1 DVI[2], 1.2Vpp on a DVI Molex 24-pin female connector; DDC signal 5Vpp (TTL)
SUPPORTED RESOLUTIONS:	640x480 @60Hz/72Hz/75Hz/85Hz; 720x400 @70Hz/85Hz; 800x600 @56Hz/60Hz/72Hz/75Hz/85Hz; 848x480 @60Hz; 1024x768 @60Hz/72Hz/75Hz/85Hz; 1152x864 @75Hz; 1280x768 @60Hz (RB)/75Hz/85Hz; 1280x800 @60Hz; 1280x960 @60Hz/85Hz; 1280x1024 @60Hz/75Hz/85Hz; 1360x768 @60Hz; 1400x1050 @60Hz(RB)/75Hz; 1440x900 @60Hz; 1440x1050 @60Hz; 1600x1200 @60Hz; 1680x1050 @60Hz; 1920x1080 @60Hz; 1920x1200 @60Hz(RB)
DVI BANDWIDTH:	1.65GHz
CONTROLS:	DIP-switches
COUPLING:	DC
POWER SOURCE:	12V, 180mA
DIMENSIONS:	10.7cm x 4.0cm x 15.9cm (4.20" x 1.59" x 6.26") W, D, H
WEIGHT:	0.15kg. (0.55lbs.) approx.
ACCESSORIES:	Power supply

8 EDID Factory Default Data

Time: 8:56:25 AM
Date: 07 December, 2010
EDID Manager Version: 1.0.0.14

Block 0 (EDID Base Block), Bytes 0 - 127, 128 BYTES OF EDID CODE:

```
     0  1  2  3  4  5  6  7  8  9
000 | 00 FF FF FF FF FF FF 00 2E 4D
010 | 02 00 9C 03 00 00 27 14 01 03
020 | 78 58 32 78 EF EE 91 A3 54 4C
030 | 99 26 0F 50 54 A5 6F 00 D1 C0
040 | B3 00 95 00 90 40 A9 40 81 00
050 | 81 40 81 C0 02 3A 80 18 71 38
060 | 2D 40 58 2C 45 00 12 2C 21 00
070 | 00 1E 66 21 50 B0 51 00 1B 30
080 | 40 70 36 00 12 2C 21 00 00 1E
090 | 28 3C 80 A0 70 B0 23 40 30 20
100 | 36 00 12 2C 21 00 00 1E 48 3F
110 | 40 30 62 B0 32 40 40 C0 13 00
120 | 12 2C 21 00 00 1E 00 1A
```

(8-9) ID Manufacture Name : KRM
(10-11) ID Product Code : 0002
(12-15) ID Serial Number :
(16) Week of Manufacture : 39
(17) Year of Manufacture : 2010

(18) EDID Version Number : 1
(19) EDID Revision Number: 3

(20) Video Input Definition: Analog
0.700, 0.000 (0.700 V p-p)
Separate Syncs

---

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

(21) Maximum Horizontal Image Size: 88 cm
(22) Maximum Vertical Image Size : 50 cm
(23) Display Gamma : 2.20
(24) Power Management and Supported Feature(s):
Standby, Suspend, Active Off/Very Low Power, RGB Color, sRGB, Preferred Timing Mode, Default GTF Supported

(25-34) Color Characteristics
Red Chromaticity : Rx = 0.636 Ry = 0.330
Green Chromaticity : Gx = 0.300 Gy = 0.596
Blue Chromaticity : Bx = 0.150 By = 0.056
Default White Point: Wx = 0.312 Wy = 0.329

(35) Established Timings I
720 x 400 @ 70Hz (IBM, VGA)
640 x 480 @ 60Hz (IBM, VGA)
640 x 480 @ 75Hz (VESA)
800 x 600 @ 60Hz (VESA)

(36) Established Timings II
800 x 600 @ 75Hz (VESA)
832 x 624 @ 75Hz (Apple, Mac II)
1024 x 768 @ 60Hz (VESA)
1024 x 768 @ 70Hz(VESA)
1024 x 768 @ 75Hz (VESA)
1280 x 1024 @ 75Hz (VESA)

(37) Manufacturer's Timings (Not Used)

(38-53) Standard Timings
1920x1080 @ 60 Hz (16:9 Aspect Ratio)
1680x1050 @ 60 Hz (16:10 Aspect Ratio)
1440x900 @ 60 Hz (16:10 Aspect Ratio)
1400x1050 @ 60 Hz (4:3 Aspect Ratio)
1600x1200 @ 60 Hz (4:3 Aspect Ratio)
1280x800 @ 60 Hz (16:10 Aspect Ratio)
1280x960 @ 60 Hz (4:3 Aspect Ratio)
1280x720 @ 60 Hz (16:9 Aspect Ratio)

(54-71) Detailed Descriptor #1: Preferred Detailed Timing (1920x1080 @ 60Hz)
Pixel Clock : 148.5 MHz
Horizontal Image Size : 530 mm
Vertical Image Size : 300 mm
Refresh Mode : Non-interlaced
Normal Display, No Stereo

Horizontal:
Active Time : 1920 Pixels
Blanking Time : 280 Pixels
Sync Offset : 88 Pixels
Sync Pulse Width: 44 Pixels
Border : 0 Pixels
Frequency : 67 kHz

Vertical:
Active Time : 1080 Lines
Blanking Time : 45 Lines
Sync Offset : 4 Lines
Sync Pulse Width: 5 Lines
Border : 0 Lines

Digital Separate, Horizontal Polarity (+), Vertical Polarity (+)

Modeline: "1920x1080" 148.500 1920 2008 2052 2200 1080 1084 1089 1125 +hsync +vsync

(72-89) Detailed Descriptor #2: Detailed Timing (1360x768 @ 60Hz)
Pixel Clock : 85.5 MHz
Horizontal Image Size : 530 mm
Vertical Image Size : 300 mm
Refresh Mode : Non-interlaced
Normal Display, No Stereo
Horizontal:
Active Time : 1360 Pixels
Blanking Time : 432 Pixels

Sync Offset : 64 Pixels
Sync Pulse Width: 112 Pixels
Border : 0 Pixels
Frequency : 47 kHz

Vertical:
Active Time : 768 Lines
Blanking Time : 27 Lines
Sync Offset : 3 Lines
Sync Pulse Width: 6 Lines
Border : 0 Lines
Digital Separate, Horizontal Polarity (+), Vertical Polarity (+)
Modeline: "1360x768" 85.500 1360 1424 1536 1792 768 771 777 795 +hsync +vsync

(90-107) Detailed Descriptor #3: Detailed Timing (1920x1200 @ 60Hz)
Pixel Clock : 154 MHz
Horizontal Image Size : 530 mm
Vertical Image Size : 300 mm
Refresh Mode : Non-interlaced
Normal Display, No Stereo
Horizontal:
Active Time : 1920 Pixels
Blanking Time : 160 Pixels
Sync Offset : 48 Pixels
Sync Pulse Width: 32 Pixels
Border : 0 Pixels
Frequency : 74 kHz
Vertical:
Active Time : 1200 Lines
Blanking Time : 35 Lines
Sync Offset : 3 Lines
Sync Pulse Width: 6 Lines
Border : 0 Lines
Digital Separate, Horizontal Polarity (+), Vertical Polarity (+)
Modeline: "1920x1200" 154.000 1920 1968 2000 2080 1200 1203 1209 1235 +hsync +vsync

(108-125) Detailed Descriptor #4: Detailed Timing (1600x1200 @ 60Hz)
Pixel Clock : 162 MHz
Horizontal Image Size : 530 mm
Vertical Image Size : 300 mm
Refresh Mode : Non-interlaced
Normal Display, No Stereo

Horizontal:
Active Time : 1600 Pixels
Blanking Time : 560 Pixels
Sync Offset : 64 Pixels
Sync Pulse Width: 192 Pixels
Border : 0 Pixels
Frequency : 75 kHz

Vertical:
Active Time : 1200 Lines
Blanking Time : 50 Lines
Sync Offset : 1 Lines
Sync Pulse Width: 3 Lines
Border : 0 Lines

Digital Separate, Horizontal Polarity (+), Vertical Polarity (+)

Modeline: "1600x1200" 162.000 1600 1664 1856 2160 1200 1201 1204 1250 +hsync +vsync

(126-127) Extension Flag and Checksum

Extension Block(s) : 0
Checksum Value : 26

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, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
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.

* FCC and CE approved using STP cable (for twisted pair products)

For the latest information on our products and a list of Kramer distributors, visit www.kramerelectronics.com**, where updates to this user manual may be found. We welcome your questions, comments and feedback.**

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

Kramer Electronics, Ltd.
Web site: www.kramerelectronics.com
E-mail: info@kramerel.com
P/N: 2900-000557 REV 3