Kramer Electronics, Ltd.

USER MANUAL

Model:

VM-4HC

1:4 HDMI Distributor

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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.

Thank you for purchasing your Kramer **VM-4HC** *1:4 HDMI Distributor* which is ideal for:

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

The package includes the following items:

- **VM-4HC** 1:4 HDMI Distributor
- 5V DC power adapter
- 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]

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1 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 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.
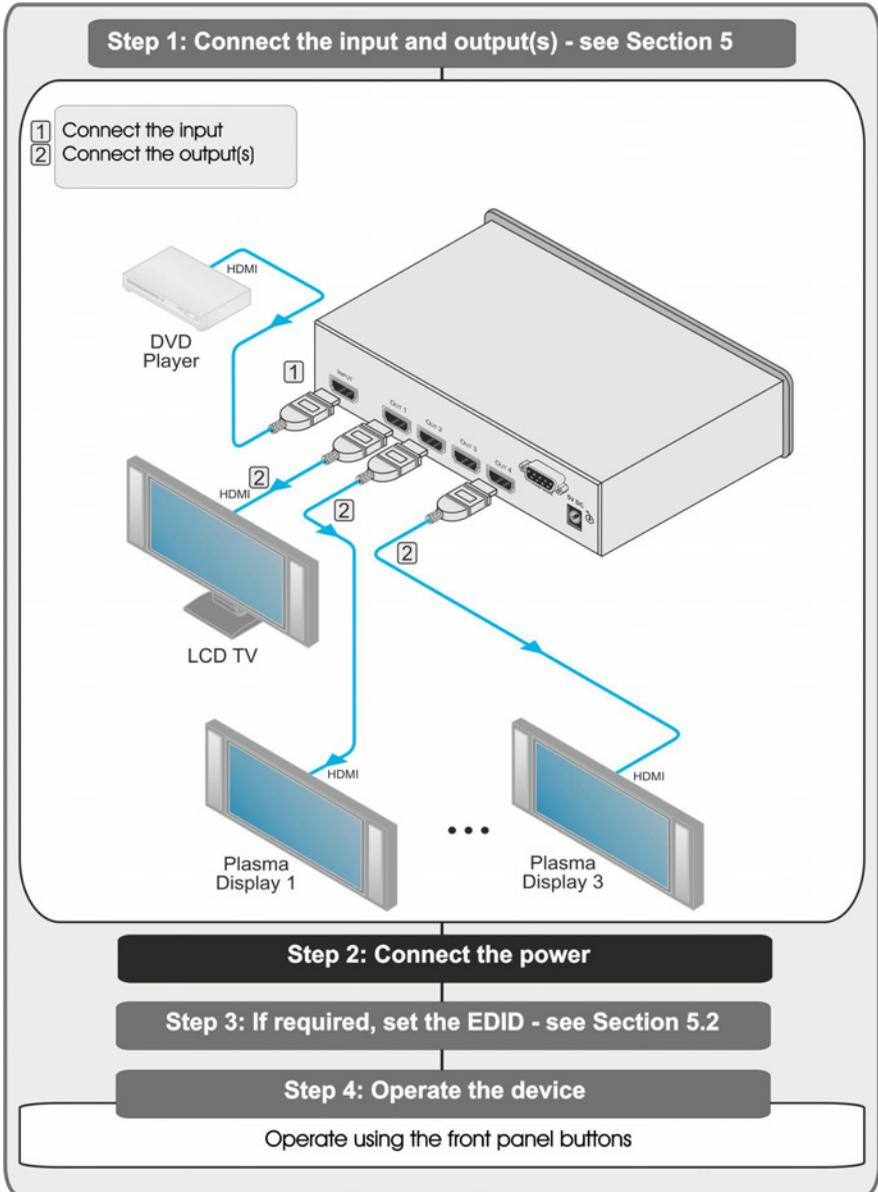
3 Overview

The Kramer **VM-4HC** is a high quality 1:4 HDMI distributor that accepts an HDMI input and distributes the signal to up to four outputs, thus making it a versatile, reliable component in a video system. The **VM-4HC** distributes signals having resolutions up to UXGA, including all HDTV formats. In particular, the **VM-4HC** features:

- Max. Data Rate - 6.75Gbps (2.25Gbps per graphic channel)
- HDTV Compatibility and HDCP Compliance
- Kramer Equalization & re-Klocking™ Technology - Rebuilds the digital signal to travel longer distances
- I-EDIDPro™ Kramer Intelligent EDID Processing™ - Intelligent EDID handling & processing algorithm ensures Plug and Play operation for HDMI systems
- EDID Acquisition - Default, single output or all connected outputs (auto-mix)
- HDMI Support - Deep Color, x.v.Color™, up to 7.1 Uncompressed Audio Channels
- 3D Pass Thru
- Active Input & Output LED Indictors
- Desktop Size - Compact size. 2 units can be rack mounted side-by-side in a 1U rack space with the optional RK-1 adapter and a 5V DC mains power adapter

3.1 About HDMI

High-Definition Multimedia Interface (HDMI) is an uncompressed all-digital[1] audio/video interface, widely supported in the entertainment and home cinema industry. It delivers the highest high-definition image and sound quality.

In particular, HDMI[2]:

- Provides a simple[3] 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 lengthy[4] cable

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

2 HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI licensing LLC

3 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

4 HDMI technology has been designed to use standard copper cable construction at up to 15 m (49ft)

- Supports standard, enhanced, high-definition video, and multi-channel digital audio[1] 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 cable[2], and user-friendly connector
- Is backward-compatible with DVI (Digital Visual Interface)
- Supports two-way CEC 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, 2K and 4K) as well as standard definition formats such as NTSC or PAL

3.2 Defining the EDID

The Extended Display Identification Data (EDID[3]) is a data-structure, provided by a display, to describe its capabilities to a graphics card (that is connected to the display's source). The EDID enables the **VM-4HC** to "know" what kind of monitor is connected to the output. The EDID includes the manufacturer's name, the product type, the timing data supported by the display, the display size, luminance data and (for digital displays only) the pixel mapping data.

3.3 Recommendations for Best Performance

To achieve the best performance:

- Connect 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)
- Avoid interference from neighboring electrical appliances and position your **VM-4HC** away from moisture, excessive sunlight and dust

!	**Caution:** No operator serviceable parts inside unit
	Warning: Use only the Kramer Electronics input power wall adapter that is provided with the unit
	Warning: Disconnect power and unplug unit from wall before installing or removing the device or servicing unit

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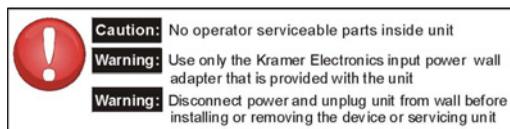
1 HDMI supports multiple audio formats, from standard stereo to multi-channel surround-sound. HDMI has the capacity to support Dolby 5.1 audio and high-resolution audio formats

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

3 Defined by a standard published by the Video Electronics Standards Association (VESA)

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4 Defining the VM-4HC 1:4 HDMI Distributor

Figure 1 and Table 1 define the front panel of the **VM-4HC** *1:4 HDMI Distributor.*
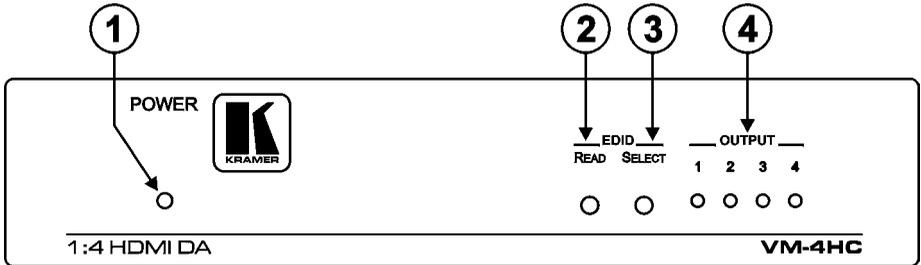
*Figure 1: VM-4HC 1:4 HDMI Distributor Front Panel*

Table 1: VM-4HC 1:4 HDMI Distributor Front Panel Features

#	Feature		Function
1	*POWER* LED		Lights red when the unit receives power
2	*EDID*	*READ* Button	Press to read the EDID of the selected output
3		*SELECT* Button	Press to cycle through the output EDID sources
4	*OUTPUT 1-4* LEDs		Lights green when an output(s) is connected and active; LEDs flash when selecting EDID (see Section 5.2)

Figure 2 and Table 2 define the rear panel of the **VM-4HC** *1:4 HDMI Distributor.*
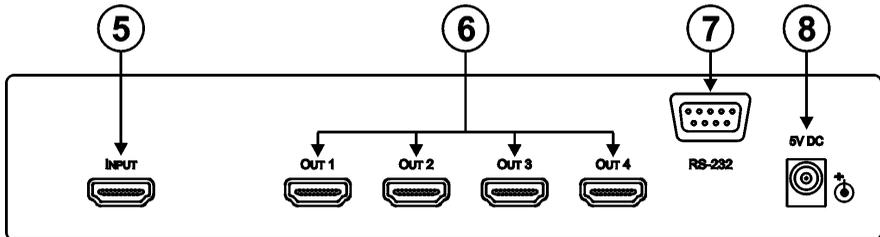
Figure 2: VM-4HC 1:4 HDMI Distributor Rear Panel

Table 2: VM-4HC 1:4 HDMI Distributor Rear Panel Features

#	Feature	Function
5	*INPUT* HDMI Connector	Connect to the HDMI source
6	*OUT 1-4* HDMI Connectors	Connect to the HDMI acceptors 1 to 4
7	*RS-232* 9-pin D-sub Connector	Not currently in use
8	*5V DC* Power Connector	Connect to the power adapter, center pin positive

5 Connecting the VM-4HC 1:4 HDMI Distributor

This section describes:

- Connecting the **VM-4HC** (see Section 5.1)
- Acquiring the EDID (see Section 5.2)

5.1 Connecting the VM-4HC
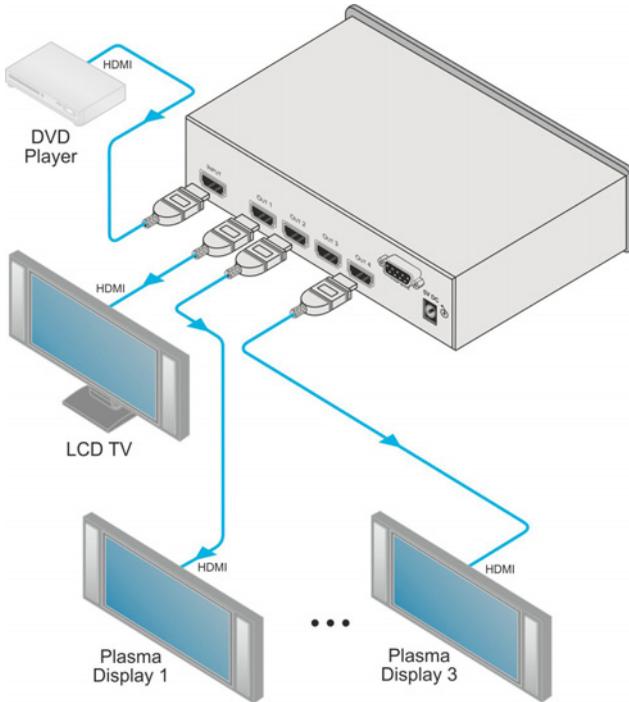
Figure 3: Connecting the VM-4HC 1:4 HDMI Distributor

To connect[1] the VM-4HC as illustrated in the example in Figure 3:

1. Connect[2] the HDMI source, for example, a DVD player to the INPUT connector.

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1 Switch off the power to each device before connecting it to your VM-4HC. After connecting your VM-4HC, switch on its

power and then switch on the power to each device

2 Using the Kramer HDMI copper cables

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2. Connect the HDMI OUTPUT connectors[1] to up to 4 HDMI acceptors as follows:
   - OUTPUT 1 to display device 1 (for example, a plasma display)
   - OUTPUT 2 to display device 2 (for example, a plasma or LCD display)
   - OUTPUT 3 to display device 3 (for example, an LCD TV)
   - OUTPUT 4 to display device 4 (for example, a plasma display)
3. Connect the power adapter to the device and to the mains electricity (not shown in Figure 3).
4. If required, acquire the EDID (see Section 5.2).

5.2 Acquiring the EDID

Initially[2] the **VM-4HC** operates with the factory default EDID[3] stored in the non-volatile memory. The source reads the EDID from the device when the device is plugged in or powered on.

The EDID[4] can be acquired from:
- One of the outputs
- The default EDID
- Up to four connected outputs using the Auto-mix Mode[5]

Repeatedly pressing the EDID SELECT button cycles through the EDID sources in the following order[6]:
- Output 1 (Output 1 LED lights)
- Output 2 (Output 2 LED lights)
- Output 3 (Output 3 LED lights)
- Output 4 (Output 4 LED lights)
- Default EDID (all LEDs light)
- Auto-Mix EDID (the LEDs flash in a running sequence)

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1 As required. Up to four outputs can be connected. Not all outputs need to be connected

2 This is usually done only once when the unit is being set up in an installation. Once acquired, the EDID is saved in non-volatile memory and further acquisition is not necessary

3 The VM-4HC reads the EDID, which is stored in the non-volatile memory

4 This is usually done only once when the machine is being set up in an installation. Once acquired, the EDID is saved in non-volatile memory and further acquisition is not necessary

5 The EDID acquired is a weighted average of all the connected outputs. For example, if several displays with different resolutions are connected to the outputs, the acquired EDID supports all the resolutions, as well as other parameters included in the EDID

6 If you attempt to acquire the EDID from an output that is not connected the default EDID is acquired

To store the selected EDID, press EDID READ as described in the following example[1].

To select the EDID from Output 3:

1. Press the EDID SELECT button repeatedly until OUTPUT 3 LED lights.
2. Press the EDID READ button.
   When the LED stops flashing the EDID from Output 3 is stored at the input.

Pressing the EDID SELECT button briefly once causes the relevant LEDs to indicate which EDID is stored at the input, as follows:

- OUTPUT 1 LED flashes—the EDID from OUTPUT 1 was the last acquired
- OUTPUT 2 LED flashes—the EDID from OUTPUT 2 was the last acquired, and so on
- All OUTPUT LEDs flash—the default EDID was the last acquired
- All OUTPUT LEDs flash sequentially—the Auto-Mix[2] EDID was the last acquired

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1 To cancel the EDID modification wait for a few seconds without touching any button

2 The EDID acquired is a weighted average of all the connected outputs. For example, if several displays with different resolutions are connected to the outputs, the acquired EDID supports all the resolutions, as well as other parameters included in the EDID

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6   Technical Specifications

Table 3 includes the technical specifications:

Table 3: Technical Specifications[1] of the VM-4HC 1:4 HDMI Distributor

INPUT:	1 HDMI connector
OUTPUTS:	4 HDMI connectors
MAX. DATA RATE:	6.75Gbps (2.25Gbps per graphic channel)
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI and HDCP
CONTROLS:	SELECT and READ buttons for selecting and storing EDID information
INDICATOR LEDs:	POWER, OUTPUTS 1-4
POWER CONSUMPTION:	5V DC, 1.1A
OPERATING TEMPERATURE:	0° to +55°C (32° to 131°F)
STORAGE TEMPERATURE:	-45° to +72°C (-49° to 162°F)
HUMIDITY:	10% to 90%, RHL non-condensing
DIMENSIONS:	21.5cm x 16.3cm x 4.4cm (8.5" x 6.4" x 1.7") W, D, H
WEIGHT:	0.6kg (1.32lbs) approx.
ACCESSORIES:	Power supply
OPTIONS:	Kramer HDMI cables[2], RK−1 19" rack adapter

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1 Specifications are subject to change without notice

2 For best results, use Kramer cables such as the C-HM/HM series, the C-HM/DM series and/or our HDMI over fiber optics C-FOHM/FOHM series

7 Default EDID

Monitor
  Model name............... VM-4HC
  Manufacturer............. KRM
  Plug and Play ID......... KRM0023
  Serial number........... 505-707455010
  Manufacture date........ 2009, ISO week 10
  Filter driver............ None

  EDID revision............ 1.3
  Input signal type........ Digital
  Color bit depth.......... Undefined
  Display type............. RGB color
  Screen size.............. 520 x 320 mm (24.0 in)
  Power management......... Standby, Suspend, Active off/sleep
  Extension blocs.......... 1 (CEA-EXT)

  DDC/CI.................. n/a

Color characteristics
  Default color space...... Non-sRGB
  Display gamma............ 2.20
  Red chromaticity......... Rx 0.674 - Ry 0.319
  Green chromaticity....... Gx 0.188 - Gy 0.706
  Blue chromaticity........ Bx 0.148 - By 0.064
  White point (default).... Wx 0.313 - Wy 0.329
  Additional descriptors... None

Timing characteristics
  Horizontal scan range.... 30-83kHz
  Vertical scan range...... 56-76Hz
  Video bandwidth.......... 170MHz
  CVT standard............. Not supported
  GTF standard............. Not supported
  Additional descriptors... None
  Preferred timing......... Yes
  Native/preferred timing.. 1280x720p at 60Hz (16:10)
    Modeline.............. "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync

Standard timings supported
   720 x 400p at 70Hz - IBM VGA
   640 x 480p at 60Hz - IBM VGA
   640 x 480p at 75Hz - VESA
   800 x 600p at 60Hz - VESA
   800 x 600p at 75Hz - VESA
  1024 x 768p at 60Hz - VESA
  1024 x 768p at 75Hz - VESA
  1280 x 1024p at 75Hz - VESA
  1280 x 1024p at 60Hz - VESA STD
  1600 x 1200p at 60Hz - VESA STD
  1152 x 864p at 75Hz - VESA STD

EIA/CEA-861 Information
  Revision number.......... 3
  IT underscan............. Supported
  Basic audio.............. Supported
  YCbCr 4:4:4.............. Supported
  YCbCr 4:2:2.............. Supported
  Native formats........... 1
  Detailed timing #1....... 1920x1080p at 60Hz (16:10)
    Modeline.............. "1920x1080" 148.500 1920 2008 2052 2200 1080 1084 1089 1125 +hsync +vsync
  Detailed timing #2....... 1920x1080i at 60Hz (16:10)
    Modeline.............. "1920x1080" 74.250 1920 2008 2052 2200 1080 1084 1094 1124 interlace +hsync +vsync
  Detailed timing #3....... 1280x720p at 60Hz (16:10)
    Modeline.............. "1280x720" 74.250 1280 1390 1430 1650 720 725 730 750 +hsync +vsync
  Detailed timing #4....... 720x480p at 60Hz (16:10)
    Modeline.............. "720x480" 27.000 720 736 798 858 480 489 495 525 -hsync -vsync

CE video identifiers (VICs) - timing/formats supported
  1920 x 1080p at 60Hz - HDTV (16:9, 1:1)
  1920 x 1080i at 60Hz - HDTV (16:9, 1:1)

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1280 x 720p at 60Hz - HDTV (16:9, 1:1) [Native]
 720 x 480p at 60Hz - EDTV (16:9, 32:27)
 720 x 480p at 60Hz - EDTV (4:3, 8:9)
 720 x 480i at 60Hz - Doublescan (16:9, 32:27)
 720 x 576i at 50Hz - Doublescan (16:9, 64:45)
 640 x 480p at 60Hz - Default (4:3, 1:1)
 NB: NTSC refresh rate = (Hz*1000)/1001

CE audio data (formats supported)
 LPCM   2-channel, 16/20/24 bit depths at 32/44/48 kHz

CE vendor specific data (VSDB)
 IEEE registration number. 0x000C03
 CEC physical address..... 1.0.0.0
 Maximum TMDS clock....... 165MHz

CE speaker allocation data
 Channel configuration.... 2.0
 Front left/right......... Yes
 Front LFE................ No
 Front center............. No
 Rear left/right.......... No
 Rear center.............. No
 Front left/right center.. No
 Rear left/right center... No
 Rear LFE................. No

Report information
 Date generated........... 15-Dec-11
 Software revision........ 2.60.0.972
 Data source.............. File
 Operating system......... 5.1.2600.2.Service Pack 3

Raw data

00,FF,FF,FF,FF,FF,FF,00,2E,4D,23,00,01,01,01,01,0A,13,01,03,80,34,20,78,EA,B3,25,AC,51,30,B4,26,
10,50,54,A5,4B,00,81,80,A9,40,71,4F,01,01,01,01,01,01,01,01,01,01,1D,00,72,51,D0,1E,20,6E,28,
55,00,07,44,21,00,00,1E,00,00,00,FF,00,35,30,35,2D,37,30,37,34,35,35,30,31,30,00,00,00,FC,00,56,
4D,2D,34,48,43,20,20,20,20,20,20,0A,00,00,00,FD,00,38,4C,1E,53,11,00,0A,20,20,20,20,20,20,01,BC,
02,03,1B,F1,48,10,05,84,03,02,07,16,01,23,09,07,07,65,03,0C,00,10,00,83,01,00,00,02,3A,80,18,71,
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1D,00,72,51,D0,1E,20,6E,28,55,00,07,44,21,00,00,1E,8C,0A,D0,8A,20,E0,2D,10,10,3E,96,00,07,44,21,
00,00,18,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,47

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.

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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: 2900-000716 REV 2