



KRAMER ELECTRONICS LTD.

# USER MANUAL

MODEL:

**VM-1H4C**

1:4 HDMI Over CAT 5 DA

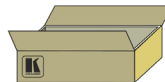
## VM-1H4C 1:4 HDMI Over CAT5 DA Quick Start Guide



This guide helps you install and use your product for the first time. For more detailed information, go to [http://www.kramerelectronics.com/support/product\\_downloads.asp](http://www.kramerelectronics.com/support/product_downloads.asp) to download the latest manual or scan the QR code on the left.

### Step 1: Check what's in the box

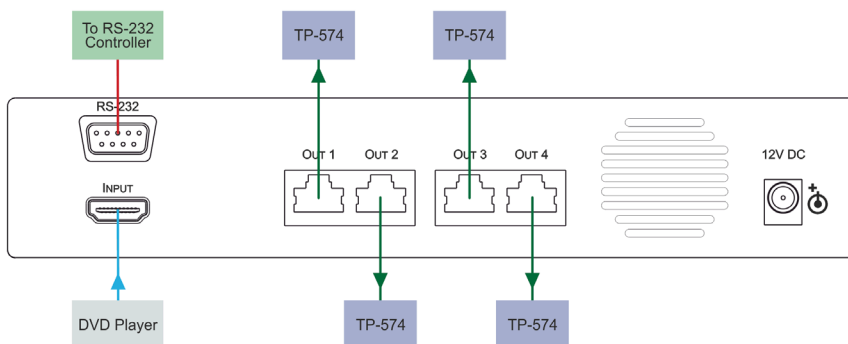
- ✓ **VM-1H4C** 1:4 HDMI Over CAT5 DA
- ✓ 1 Quick Start Guide
- ✓ Power adapter (12V DC)
- ✓ 4 Rubber feet



Save the original box and packaging materials in case your Kramer product needs to be returned to the factory for service.

### Step 2: Connect the inputs and outputs

Always switch off the power to all devices before connecting them to your **VM-1H4C**.



For best results, we recommend that you always use Kramer high-performance cables when connecting AV equipment to the **VM-1H4C**.

### Step 3: Connect the power

Connect the power adapter to the **VM-1H4C** and plug the adapter into the mains electricity.



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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 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 and GROUP 11: Sierra Products.

Thank you for purchasing the Kramer **VM-1H4C** *1:4 HDMI Over CAT 5 DA* which is ideal for:

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

## 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 <http://www.kramerelectronics.com> 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 neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer **VM-1H4C** away from moisture, excessive sunlight and dust



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

### 2.2 Safety Instructions



**Caution:** No operator serviceable parts inside the unit

**Warning:** Use only the Kramer Electronics input power wall adapter that is provided with the unit.

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

## 2.3 Shielded Twisted Pair

Kramer engineers have developed special shielded twisted pair cables to best match our digital twisted pair products; the Kramer: **BC-DGKat524** (CAT 5 24 AWG), the Kramer **BC-DGKat623** (CAT 6 23 AWG), and the Kramer **BC-DGKat7a23** (CAT 7a 23 AWG) cables. These specially built cables significantly outperform regular CAT 5/CAT 6 /CAT 7a cables.

The **VM-1H4C** supports a range of up to:

- Up to 90m (295ft) at 1080i, or up to 30m (98ft) at 1080p on shielded **BC-DGKat524** cable
- Up to 90m (295ft) at 1080i, or up to 70m (230ft) at 1080p on shielded **BC-DGKat623** cable
- Up to 100m (330ft) at 1080i or up to 90m (295ft) at 1080p on shielded **BC-DGKat7a23** cable

You can daisy-chain up to six DigiKat devices with the maximum overall distance between the first and last devices being cumulative and limited to 500m.

## 2.4 About the Power Provision Feature

Only the **VM-1H4C** needs to be connected to a power source when the devices are within 90m (270ft) of each other – the **VM-1H4C** can provide power to the receiver over the TP cable. This feature applies as long as the cable can carry power and the distance does not exceed 90m on standard TP cable. For longer distances, heavier gauge cable should be used (standard TP cable is still suitable for the video/audio transmission, but not for feeding the power at these distances).

## 2.5 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 <http://www.kramerelectronics.com/support/recycling/>.

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## 3 Overview

The high quality **VM-1H4C** is a distribution amplifier for HDMI, IR and bidirectional RS-232 signals over TP (Twisted Pair) cable. It reclocks and equalizes the input signal and distributes it to four TP outputs.

More specifically, the **VM-1H4C**:

- Supports up to 4.95Gbps data rate (1.65Gbps per graphic channel)
- Can read and store the default EDID or the EDID block from one or a mix of the output display devices in non-volatile memory, so it can then provide the EDID information to the source even if the display device is not connected
- Features I-EDIDPro™ Kramer Intelligent EDID Processing™ – Intelligent EDID handling & processing algorithm ensures Plug and Play operation for HDMI systems
- Supports 3D Pass-through, x.v.Color™ and uncompressed audio channels (Dolby TrueHD, DTS-HD)
- Is HDCP compliant
- Features LEDs indicating a live input and the active output
- Has a remote IR 3.5mm mini jack that supports bidirectional IR signals
- Supports bidirectional, RS-232 serial data
- Is 12V DC fed and is housed in a Kramer Desktop enclosure



# 4 Defining the VM-1H4C 1:4 HDMI Over CAT 5 DA

The **VM-1H4C** encodes the HDMI, IR and RS-232 signals and transmits them over TP cable to a compatible receiver (for example, the Kramer **TP-574 HDMI/RS-232/IR Line Receiver**).

[Figure 1](#) defines the front and rear panels of the **VM-1H4C**.

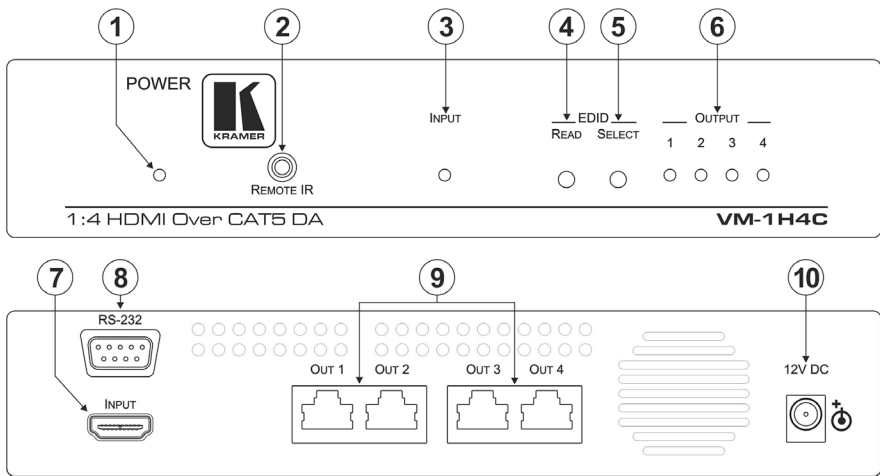


Figure 1: VM-1H4C 1:4 HDMI Over CAT 5 DA Front and Rear Panels

#	Feature		Function
1	POWER LED		Lights green when the unit receives power
2	REMOTE IR 3.5mm Mini Jack		Connect to the remote IR emitter or receiver
3	INPUT LED		Lights green when the input receives a signal. Flashes when connected but there is no active signal
4	EDID	READ Button	Press to capture the EDID from the active output, (see <a href="#">Section 6</a> )
5		SELECT Button	Press to select the output from which to capture the EDID
6	OUTPUT 1~4 LEDs		The relevant LED lights green when that output is connected
7	INPUT HDMI Connector		Connect to the HDMI source
8	RS-232 9-pin D-sub Connector		Connect to an RS-232 controller, (see <a href="#">Section 5.1</a> )
9	OUT 1 ~ 4	TP Output RJ-45 Connectors	Connect to the LINE IN RJ-45 connector on the TP receivers, for example, TP-574, (see <a href="#">Section 7</a> )
10	12V DC Power Connector		Connect to the +12V DC power adapter. Center pin positive

## 5 Connecting the VM-1H4C



Always switch off the power to all devices before connecting them to your **VM-1H4C**.

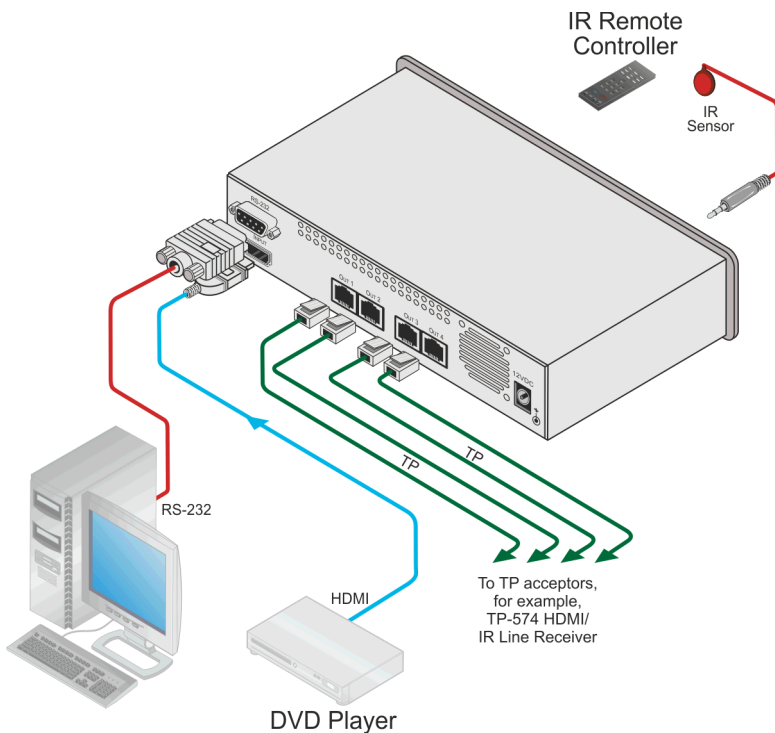


Figure 2: Connecting the VM-1H4C



**Warning:** Using a TP cable that is incorrectly wired may cause permanent damage to the device

To connect the VM-1H4C as illustrated in the example in [Figure 2](#):

1. Connect the HDMI source, (for example, a DVD player) to the Input (HDMI) connector.
2. Connect the TP RJ-45 outputs to up to four TP acceptors, (for example, **TP-574**).

3. Connect the front panel remote IR 3.5mm mini jack to the IR device, (for example, an IR emitter).

**Note:** All data is passed simultaneously to all four TP outputs.

4. Optional—Connect to a serial controller, (for example, a computer) to the RS-232 9-pin D-sub connector.

## 5.1 Connecting a Controller to the RS-232 Port

**To connect a controller to the device via the RS-232 serial port:**

- If the controlled device requires a crossed connection, use a straight cable from the computer to the transmitter and use a straight cable from the receiver to the device
- If the controlled device requires a straight connection, use a straight cable from the computer to the transmitter and use a crossed cable from the receiver to the device

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## 6 Acquiring the EDID

The **VM-1H4C** is programmed with a default EDID (see [Section 9](#)). This lets you connect the power before having to connect one of the acceptors. To change this default EDID, you must acquire the new EDID from a display device.

You can acquire the EDID from:

- One of the connected outputs (the relevant output LED lights)
- The default EDID (all output LEDs light)
- Up to four connected outputs using the Auto-mix Mode (all output LEDs light in a running pattern)

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.

### To acquire the EDID:

1. Connect the output(s) from which you want to acquire the EDID, (see [Section 5](#)).
2. Press the EDID SELECT button briefly.  
The device enters the EDID programming mode.
3. Press the EDID SELECT button repeatedly until the required EDID is indicated based on the patterns described above.
4. Press the EDID READ button.

The relevant LEDs flash in a pattern for a few seconds as follows:

- Slowly and then no longer lights.  
The EDID was successfully read.
- Quickly and then no longer lights.  
The EDID was not read and the default EDID was stored.

# 7      Wiring the Twisted Pair RJ-45 Connectors

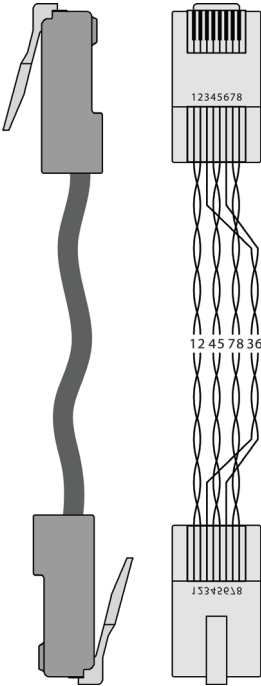
When using STP cable, connect/solder the cable shield to the RJ-45 connector shield. [Figure 3](#) defines the TP pinout using a straight pin-to-pin cable with RJ-45 connectors.



Note, that the cable Ground shielding must be connected/soldered to the connector shield.

EIA / TIA 568B	
PIN	Wire Color
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown
Pair 1	4 and 5
Pair 2	1 and 2
Pair 3	3 and 6
Pair 4	7 and 8

Figure 3: TP Pinout Wiring



**Warning:** Using a TP cable that is incorrectly wired may cause permanent damage to the device

## 8 Technical Specifications

INPUTS:	1 HDMI connector 1 IR on a 3.5mm mini jack 1 RS-232 on a 9-pin D-sub connector
OUTPUTS:	4 TP on RJ-45 connectors
BANDWIDTH:	Supports up to 4.95Gbps (1.65Gbps per graphic channel)
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI and HDCP
INDICATOR LEDs:	Power, INPUT, OUTPUT 1, 2, 3 and 4
POWER CONSUMPTION:	12V DC, 2A
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
DIMENSIONS:	21.5cm x 16.2cm x 4.4cm (8.5in x 6.38in x 1.7in) W, D, H
WEIGHT:	0.9kg (1.98lbs) approx.
ACCESSORIES:	Power supply
OPTIONS:	HDMI/HDMI male to male cables, RK-1 19" rack adapter

## 9 Default EDID

The factory default EDID is listed below.

### Monitor

Model name..... VM1H4C  
Manufacturer..... KRM  
Plug and Play ID..... KRM0114  
Serial number..... 505-707455010  
Manufacture date..... 2009, ISO week 10

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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)

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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 ST

## 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](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.





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

**We welcome your questions, comments, and feedback.**

Web site: [www.kramerelectronics.com](http://www.kramerelectronics.com)

E-mail: [info@kramerel.com](mailto:info@kramerel.com)



#### **SAFETY WARNING**

Disconnect the unit from the power supply before opening and servicing



P/N: 2900-300133



Rev: 3