



KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

VM-24HC

2 Input 1:4 HDMI Distributor

P/N: 2900-000717 Rev 3

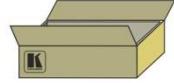


VM-24HC Quick Start Guide

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 to download the latest manual or scan the QR code on the left.

Step 1: Check what's in the box

- | | |
|--|--|
| <input checked="" type="checkbox"/> VM-24HC 2 Input 1:4 HDMI Distributor | <input checked="" type="checkbox"/> 4 Rubber feet |
| <input checked="" type="checkbox"/> Kramer RC-IR3 Infrared Remote Control Transmitter with batteries and user manual | <input checked="" type="checkbox"/> 1 Quick Start sheet |
| | <input checked="" type="checkbox"/> 1 Power supply (5V DC) |



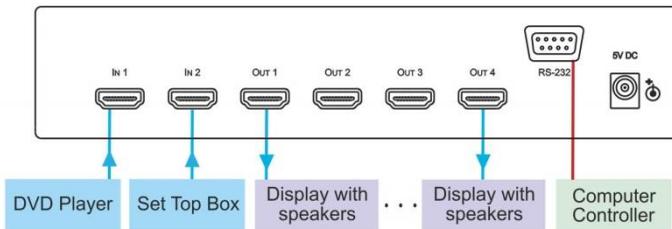
Save the original box and packaging materials should you need to return your VM-24HC for service.

Step 2: Install the VM-24HC

Attach the rubber feet and place on a table or mount the VM-24HC in a rack (using an optional RK-1 rack mount).

Step 3: Connect the inputs and outputs

Always switch off the power on each device before connecting it to your VM-24HC.



Always use Kramer high-performance cables for connecting AV equipment to the VM-24HC.

Step 4: Connect the power

Connect the 5V DC power adapter to the VM-24HC and plug the adapter into the mains electricity.



Step 5: Operate the VM-24HC

- Press the EDID SELECT button to cycle through the EDID sources in the following order:
 - 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)
- To store the EDID, press EDID READ and the EDID is acquired.

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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 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 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.

Congratulations on purchasing your Kramer **VM-24HC 2 Input 1:4 HDMI Distributor**, which is ideal for the following typical applications:

- 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/support/product_downloads.asp 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-24HC** 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 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 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/>.

3 Overview

The **VM-24HC** is a high-performance switcher and distribution amplifier for HDMI signals. The unit accepts one of two HDMI inputs and distributes the selected signal to four HDMI outputs simultaneously.

The **VM-24HC** features:

- A maximum data rate of 6.75Gbps (2.25Gbps per graphics channel)
- HDTV compatibility
- HDCP compliance
- I-EDIDPro™ Kramer Intelligent EDID Processing™, an intelligent EDID handling & processing algorithm ensures Plug and Play operation for HDMI systems
- EDID handling that acquires the EDID from one output, from all connected outputs (auto-mix) or uses a default EDID
- Kramer Equalization & re-Klocking™ Technology that rebuilds the digital signal to travel longer distances
- HDMI support for Deep Color, x.v.Color™, up to 7.1 Uncompressed Audio Channels
- 3D Pass-Through
- Flexible control options via front panel, IR remote & RS-232
- Compact desktop size where two units can be rack mounted side-by-side in a 1U rack space with the optional RK-1 adapter

3.1 Defining the VM-24HC 2 Input 1:4 HDMI Distributor

This section defines the **VM-24HC**.

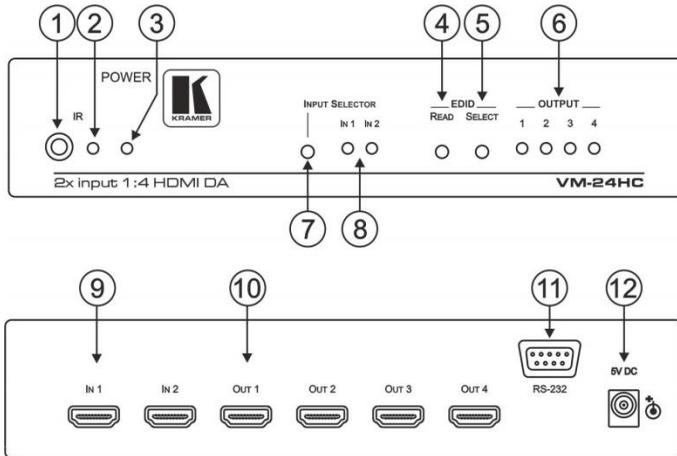


Figure 1: VM-24HC 2 Input 1:4 HDMI Distributor

#	Feature	Function
1	IR Receiver	IR signal sensor for the IR remote control
2	IR LED	Lights yellow when the device receives an IR signal
3	POWER LED	Lights green when the device receives power
4	EDID READ Button	Press to acquire the EDID following selecting the EDID source. Press again to indicate the EDID status
5	EDID SELECT Button	Press to select the EDID source (single output, Auto-Mix or default)
6	OUTPUT LEDs (1 to 4)	Lights green when an output is connected and active. LED flashes to indicate the source of the EDID acquired (see Section 5.3) or when connecting a non-HDCP display while providing HDCP content to the VM-24HC
7	INPUT SELECTOR Button	Press to select Input 1 or 2 (see Section 5.1)
8	IN 1 LED	Lights green when Input 1 is selected
	IN 2 LED	Lights green when Input 2 is selected
9	INPUT 1 and INPUT 2 HDMI Connectors	Connect to the HDMI sources 1 and 2
10	OUTPUT 1 to OUTPUT 4 HDMI Connectors	Connect to the HDMI acceptors 1 to 4
11	RS-232 9-pin D-sub Port	Connects to a PC/remote controller (see Section 5.1)
12	5V DC Power Connector	Connects to the power adapter, center pin positive

4 Connecting the VM-24HC



Always switch off the power to each device before connecting it to your **VM-24HC**. After connecting your **VM-24HC**, connect its power and then switch on the power to each device.

To connect the **VM-24HC** as illustrated in the example in [Figure 2](#):

1. Connect the two HDMI sources, for example, a DVD player and a set top box to the INPUT 1 and INPUT 2 connectors, respectively.
2. Connect the HDMI OUTPUT connectors to up to 4 HDMI acceptors. In this example, connect:
Not all outputs need be connected.
 - OUTPUT 1 to display device 1 (for example, an LCD TV)
 - OUTPUT 2 to display device 2 (for example, an LCD TV)
 - OUTPUT 3 to display device 3 (for example, an LCD TV)
 - OUTPUT 4 to display device 4 (for example, a plasma display)
3. If required, connect a PC and/or controller to the RS-232 port (see [Section 5.1](#)).
4. Connect the power adapter to the device and to the mains electricity (not shown in [Figure 2](#)).
5. If required, acquire the EDID (see [Section 5.3](#)).

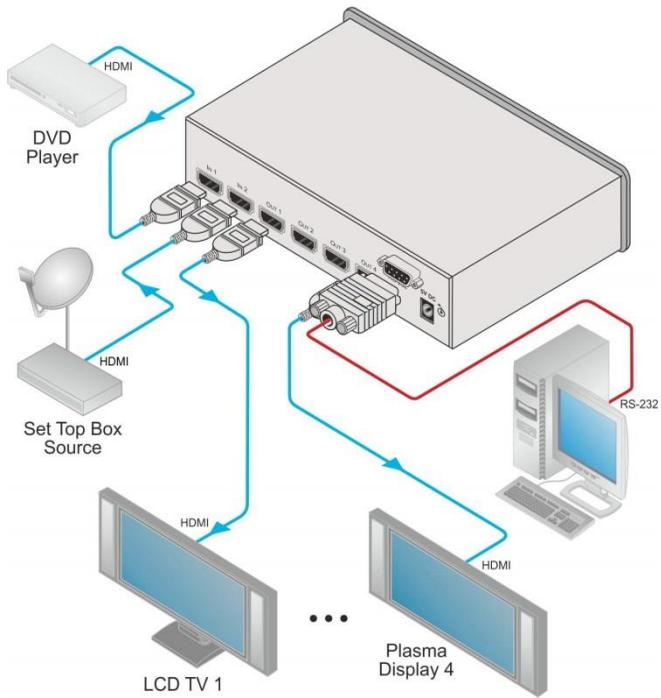


Figure 2: Connecting the VM-24HC 2 Input 1:4 HDMI Distributor

5 Using the VM-24HC 2 Input 1:4 HDMI Distributor

The **VM-24HC** always displays the video output on all of the four outputs at the same time (once they are ready to display the output) upon power up and when switching an input (from IN 1 to IN 2 and vice versa).

This section describes:

- Selecting an Active Input (see [Section 5.1](#))
- Connecting a PC/Controller via RS-232 (see [Section 5.2](#))
- Acquiring the EDID (see [Section 5.3](#))

5.1 Selecting an Active Input

but we need a note somewhere in there stating the video output will be displayed simultaneously upon power up or introduction of new video once all output ports are ready

To select an active input:

- Press the INPUT SELECTOR button to toggle between inputs 1 and 2

5.2 Connecting a PC/Controller via RS-232

You can connect a PC or serial controller to the **VM-24HC** using the RS-232 connection. Note that a null-modem adapter/connection is not required.

To connect to the VM-24HC via RS-232:

- Connect the RS-232 9-pin D-sub rear panel port on the **VM-24HC** unit via a 9-wire straight cable (only pin 2 to pin 2, pin 3 to pin 3, and pin 5 to pin 5 need to be connected) to the RS-232 9-pin D-sub port on your PC/controller

5.3 Acquiring the EDID

Initially the **VM-24HC** operates with the factory default EDID stored in the non-volatile memory. The source reads the EDID from the device when the device is plugged in or powered on.

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.

The VM-24HC reads the EDID, which is stored in the non-volatile memory.

The EDID can be acquired from:

- One output
- The default EDID
- Up to four connected outputs using the Auto-mix Mode

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.

Repeatedly pressing the EDID SELECT button cycles through the EDID sources in the following order:

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

- 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)

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

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

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 light—the default EDID was the last acquired
- All OUTPUT LEDs flash sequentially—the Auto-Mix EDID was the last acquired

6 Technical Specifications

INPUTS:	2 HDMI connectors
OUTPUTS:	4 HDMI connectors
BANDWIDTH:	Supports up to 2.25Gbps bandwidth per graphic channel
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI and HDCP
CONTROLS:	EDID SELECT, EDID READ, IN 1, IN 2 buttons, RS-232, IR
INDICATOR LEDs:	POWER, IR, OUTPUT
POWER CONSUMPTION:	5V DC, 1.1A
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 16.3cm x 4.4cm (8.5" x 6.4" x 1.7") W, D, H
WEIGHT:	0.6kg (1.3lbs) approx.
ACCESSORIES:	Power supply
OPTIONS:	RK-1 19" rack adapter
Specifications are subject to change without notice at http://www.kramerelectronics.com	

7 Default Communication Parameters

EDID	
EDID data is passed between Output 1 and Input 1	
RS-232	
Protocol 2000	
Baud Rate	9600
Data Bits	8
Stop Bits	1
Parity	None
Command Format	HEX
Example (Output 1 to Input 1)	0x01, 0x81, 0x81, 0x81

8 Default EDID

Monitor

Model name..... VM24HC
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

9 Protocol 2000

This RS-232/RS-485 communication protocol uses four bytes of information as defined below.

For RS-232, a null-modem connection between the machine and controller is used. The default data rate is 9600 baud, with no parity, 8 data bits and 1 stop bit.

Note: Compatibility with Kramer's Protocol 2000 does not mean that a machine uses all of the commands below. Each machine uses a sub-set of Protocol 2000, according to its needs.

9.1 Syntax

MSB								LSB
1st Byte		DESTINATION			INSTRUCTION			
0	D	N5	N4	N3	N2	N1	N0	
7	6	5	4	3	2	1	0	
2nd Byte		INPUT						
1	I6	I5	I4	I3	I2	I1	I0	
7	6	5	4	3	2	1	0	
3rd Byte		OUTPUT						
1	O6	O5	O4	O3	O2	O1	O0	
7	6	5	4	3	2	1	0	
4th Byte		MACHINE NUMBER						
1	OVR	X	M4	M3	M2	M1	M0	
7	6	5	4	3	2	1	0	

1st Byte: Bit 7 – Defined as 0
 D – DESTINATION:
 0 – Sends information to the switchers (from the PC)
 1 – Sends information to the PC (from the switcher)
 N5...N0 – INSTRUCTION

The 6-bit INSTRUCTION defines the function performed by the switcher(s). If a function is performed using the machine's keyboard, these bits are set with the INSTRUCTION NO. performed. The instruction codes are defined according to the table below (INSTRUCTION NO. is the value set in N5...N0).

2nd Byte: Bit 7 – Defined as 1
 I6...I0 – INPUT

When switching (i.e. instruction codes 1 and 2), the 7-bit INPUT is set as the input number to be switched. If switching is done using the machine's front panel, these bits are set with the INPUT NUMBER switched. For other operations, these bits are defined according to the table.

3rd Byte: Bit 7 – Defined as 1
 O6...O0 – OUTPUT

When switching (i.e. instruction codes 1 and 2), the 7-bit OUTPUT is set as the output number to be switched. If switching is done using the machine's front panel, these bits are set with the OUTPUT NUMBER switched. For other operations, these bits are defined according to the table.

4th Byte: Bit 7 – Defined as 1
 Bit 5 – Don't care
 OVR – Machine number override
 M4...M0 – MACHINE NUMBER

This byte is used to address machines in a system by their machine numbers. When several machines are controlled from a single serial port, they are usually configured together and each machine has an individual machine number. If the OVR bit is set, then all machine numbers accept (implement) the command and the addressed machine replies. When a single machine is controlled over the serial port, always set M4...M0 to 1, and make sure that the machine itself is configured as MACHINE NUMBER = 1.

9.2 Instruction Codes

All the values in the table are decimal, unless otherwise stated

Instruction Codes for Protocol 2000				
Instruction		Definition for Specific Instruction		Notes
#	Description	Input	Output	
1	SWITCH VIDEO	Set equal to video input that is switched (0 = disconnect)	Set equal to video output that is switched (0 = to all the outputs)	2, 15
31	REQUEST WHETHER PANEL IS LOCKED	0	0	16
61	IDENTIFY MACHINE	1 – Video machine name 2 – Audio machine name 3 – Video software version 4 – Audio software version 5 – RS-422 controller name 6 – RS-422 controller version 7 – Remote control name 8 – Remote software version 9 – Protocol 2000 revision 10 – Control data machine name 11 – Control data software version	For names: 0 – Request first 4 digits 1 – Request first suffix 2 – Request second suffix 3 – Request third suffix 10 – Request first prefix 11 – Request second prefix 12 – Request third prefix For versions: 0 – main board or the number of external board	13
62	DEFINE MACHINE	1 – Number of inputs 2 – Number of outputs 3 – Number of setups	1 – For video 2 – For audio 3 – For SDI 4 – For remote panel 5 – For RS-422 controller 6 – For control data	14

NOTES on the above table:

NOTE 2 – These are bi-directional definitions. If the switcher receives the code, it performs the instruction. If the instruction is performed (due to a keystroke operation on the front panel), then these codes are sent.

For example, if the PC sends HEX code:

01 85 88 83

then the switcher (machine 3) switches input 5 to output 8.

If the user switches input 1 to output 7 using the front panel buttons, the switcher sends HEX code:

41 81 87 83

to the PC.

When the PC sends one of the commands in this group to the switcher, if the instruction is valid, the switcher replies by sending the same four bytes to the PC that it received (except for the first byte, where the DESTINATION bit is set high).

NOTE 13 – This is a request to identify the switcher/s in the system. If the OUTPUT is set as 0, and the INPUT is set as 1, 2, 5 or 7, the machine sends its name. The reply is the decimal value of the INPUT and OUTPUT.

For example, for a 2216, the reply to the request to send the audio machine name is HEX code:

7D 96 90 81 (i.e. $128_{dec} + 22_{dec}$ for 2nd byte, and $128_{dec} + 16_{dec}$ for 3rd byte).

If the request for identification is sent with the INPUT set as 3 or 4, the appropriate machine sends its software version number. Again, the reply would be the decimal value of the INPUT and OUTPUT - the INPUT representing the number in front of the decimal point, and the OUTPUT representing the number after it.

For example, for version 3.5, the reply to the request to send the version number would be HEX code:

7D 83 85 81 (i.e. $128_{dec} + 3_{dec}$ for 2nd byte, $128_{dec} + 5_{dec}$ for 3rd byte).

If the OUTPUT is set as 1, then the ASCII coding of the lettering following the machine's name is sent.

For example, for the VS-7588YC, the reply to the request to send the first suffix would be HEX code:

7D D9 C3 81 (i.e. $128_{dec} + \text{ASCII for "Y"}$; $128_{dec} + \text{ASCII for "C"}$).

NOTE 14 – The number of inputs and outputs refers to the specific machine being addressed, *not* to the system.

For example, if six 16x16 matrices are configured to make a 48x32 system (48 inputs, 32 outputs), the reply to the HEX code:

3E 82 81 82 (i.e. request the number of outputs)

would be HEX code:

7E 82 90 82 (i.e. 16 outputs).

NOTE 15 – When the OVR bit (4th byte) is set, then the video commands have universal meaning.

For example, instruction 1 (SWITCH VIDEO) causes all units (including audio, data, etc.) to switch. Similarly, if a machine is in FOLLOW mode, it performs any video instruction.

NOTE 16 – The reply to the REQUEST WHETHER PANEL IS LOCKED is the same as in NOTE 4 above, except that OUTPUT is assigned with the value 0 if the panel is unlocked, or 1 if it is locked.

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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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 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

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CE



SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing



P/N: 2900-000717



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