KRAMER

USER MANUAL

MODELS:

TP-873XR HDMI 4K Line Transmitter
TP-874XR HDMI 4K Line Receiver

Contents

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!

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.

(i) Go to www.kramerav.com/downloads/TP-873XR or www.kramerav.com/downloads/TP-874XR to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

Achieving 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 **TP-873XR** or **TP-874XR** away from moisture, excessive sunlight and dust.

Safety Instructions

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

- For products with relay terminals and GPI\O ports, please refer to the permitted rating for an external connection, located next to the terminal or in the User Manual.

- There are no operator serviceable parts inside the unit.

Warning:
- Use only the power cord that is supplied with the unit.

- To ensure continuous risk protection, replace fuses only according to the rating specified on the product label which located on the bottom of the unit.

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 www.kramerav.com/support/recycling.

Overview

Congratulations on purchasing your Kramer **TP-873XR HDMI 4K Line Transmitter** and **TP-874XR HDMI 4K Line Receiver**.

TP-873XR and **TP-874XR** are a high-performance, long-reach DGKat™ 2.0 transmitter and receiver for 4K@60Hz (4:4:4) HDR HDCP 2.2 signals, RS-232 and IR signals and 2-way powering over twisted pair.

TP-873XR converts the HDMI™, RS-232 and IR input signals into a DGKat™ 2.0 signal and transmits it to the receiver. **TP-874XR** converts the transmitted DGKat™ 2.0 signal into HDMI, RS-232 and IR signals.

TP-873XR and **TP-874XR** extend video signals to up to 50m (160ft) at 4K@60Hz (4:4:4) resolution and up to 70m (230ft) at 4K@30Hz (4:4:4) 24bpp resolution over Kramer shielded cables.

TP-873XR and **TP-874XR** provide exceptional quality, and advanced and user-friendly operation.

Exceptional Quality

- High Performance Extender – Professional DGKat™ 2.0 for providing long-reach signals and 2-way power over twisted pair copper infrastructures. **TP-873XR** and **TP-874XR** employ low-level video compression technology that delivers visually lossless performance for 4K@60Hz (4:4:4) HDR signals with near-zero latency.

- HDMI Signal Extension – Support deep color, x.v.Color™, lip sync, HDMI uncompressed audio channels, Dolby TrueHD, DTS-HD, 2K, 4K and 3D, as specified in HDMI 2.0.

- HDR and HDCP 2.2 compliance.

Advanced and User-friendly Operation

- EDID Pass-through – Pass-through algorithm ensures plug-and-play operation for HDMI source and display systems.

- Multi-channel Audio Extension – Up to 32 channels of digital stereo uncompressed signals for supporting studio–grade surround sound.

- Bidirectional RS-232 Extension – Serial interface data flows in both directions, allowing data transmission and device control.

- Bidirectional Infrared Extension – IR interface data flows in both directions, allowing remote control of peripheral devices located at either end of the extended line.

- Cost-effective Maintenance – Status LED indicators for local and remote HDMI ports facilitate easy local maintenance and troubleshooting.

- Easy Installation – Single twisted-pair cable for signal and power wiring. Compact DigiTOOLS® fan-less enclosure for device-back mounting, or side-by-side mounting of 3 units in a 1U rack space with the optional, compatible Kramer rack adapter.

Typical Applications

TP-873XR and **TP-874XR** are ideal for the following typical applications:

- Long-distance AV and control signal extension for large room connectivity.
- AV extension in meeting rooms, boardrooms, hotels and corporate facilities.

Defining TP-873XR HDMI 4K Line Transmitter

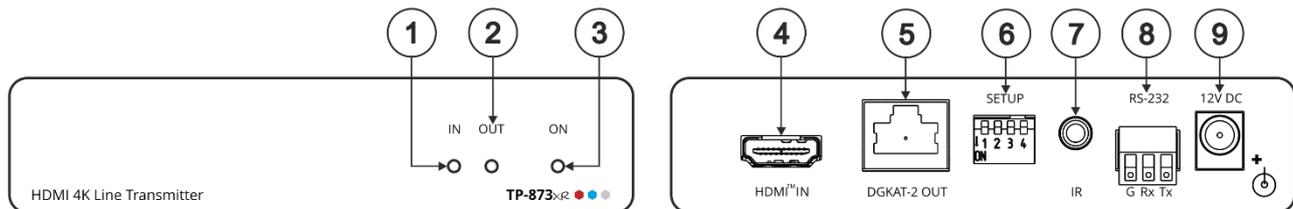## TP-873XR HDMI 4K Line Transmitter

This section defines **TP-873XR**.

Figure 1: TP-873XR HDMI 4K Line Transmitter

#	Feature	Function
1	IN LED	Lights green when an active source device input signal is detected.
2	OUT LED	Lights green when an active, far-end sink (acceptor) output signal is detected via the DGKAT link.
3	ON LED	Lights green when the device receives power.
4	HDMI™ IN Connector	Connect to an HDMI source.
5	DGKAT-2 OUT RJ-45 Connector	Connect to the DGKAT-2 IN RJ-45 connector on the **TP-874XR**.
6	SETUP DIP-switches	Set the operation DIP-switches (see Setting the DIP-Switches on page 9).
7	IR 3.5mm Mini Jack Connector	Connect to an external infrared emitter / sensor for IR signal bidirectional extension to control a remote device. For example, connect to an external infrared sensor to control the HDMI OUT acceptor that is connected to **TP-874XR**.
8	RS-232 (G, Rx, Tx) 3-pin Terminal Block Connector	Connect to an RS-232 port for serial signal bidirectional extension to the receiver. For example, connect to an **SL-240C** controller device to serially control the HDMI OUT acceptor that is connected to **TP-874XR**. For firmware upgrade via the RS-232 port, contact Kramer Tech Support.
9	12V DC Power Connector	12V DC connector for powering the unit when it is not powered by **TP-874XR** via the DGKAT link.

TP-874XR HDMI 4K Line Receiver
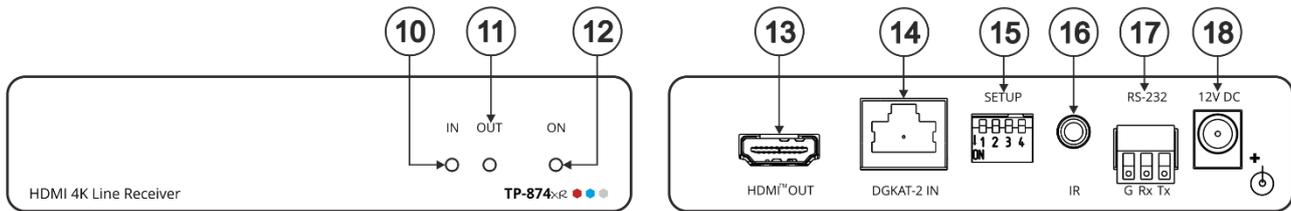
This section defines **TP-874XR**.

Figure 2: TP-874XR HDMI 4K Line Receiver

#	Feature	Function
10	IN LED	Lights green when an active source device input signal is detected.
11	OUT LED	Lights green when an active, far-end sink (acceptor) output signal is detected via the HDBT link.
12	ON LED	Lights green when the device receives power.
13	HDMI™ OUT Connector	Connect to an HDMI acceptor.
14	DGKAT-2 IN RJ-45 Connector	Connect to the DGKAT-2 OUT RJ-45 connector on the **TP-873XR**.
15	SETUP DIP-switches	Set the operation DIP-switches (see Setting the DIP-Switches on page 9).
16	IR 3.5mm Mini Jack Connector	Connect to an external infrared emitter / sensor for IR signal bidirectional extension. For example, connect to an external infrared sensor to control the HDMI IN source that is connected to **TP-873XR**.
17	RS-232 (G, Rx, Tx) 3-pin Terminal Block Connector	Connect to an RS-232 port for serial signal bidirectional extension to the transmitter. For example, connect to an RS-232 device to be controlled, for example, a display. For firmware upgrade via the RS-232 port, contact Kramer Tech Support.
18	12V DC Power Connector	12V DC connector for powering the unit when it is not powered by **TP-873XR** via the DGKAT link.

Mounting TP-873XR/TP-874XR

This section provides instructions for mounting **TP-873XR/TP-874XR**. Before installing, verify that the environment is within the recommended range:

- Operation 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.

Caution:
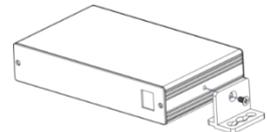- Mount **TP-873XR/TP-874XR** before connecting any cables or power.

Warning:
- Ensure that the environment (e.g., maximum ambient temperature & air flow) is compatible for the device.
- Avoid uneven mechanical loading.
- Appropriate consideration of equipment nameplate ratings should be used for avoiding overloading of the circuits.
- Reliable earthing of rack-mounted equipment should be maintained.

To mount the TP-873XR/TP-874XR on a rack:

Mount the unit in a rack using the recommended rack adapter
(see www.kramerav.com/product/TP-873XR)

To mount the TP-873XR/TP-874XR on a table or shelf:

- Attach the rubber feet and place the unit on a flat surface.
- Fasten a bracket (included) on each side of the unit and attach it to a flat surface.

For more information go to www.kramerav.com/downloads/TP-873XR

Connecting TP-873XR/TP-874XR

ⓘ Always switch off the power to each device before connecting it to your **TP-873XR**/**TP-874XR**. After connecting your **TP-873XR**/**TP-874XR**, connect its power and then switch on the power to each device.
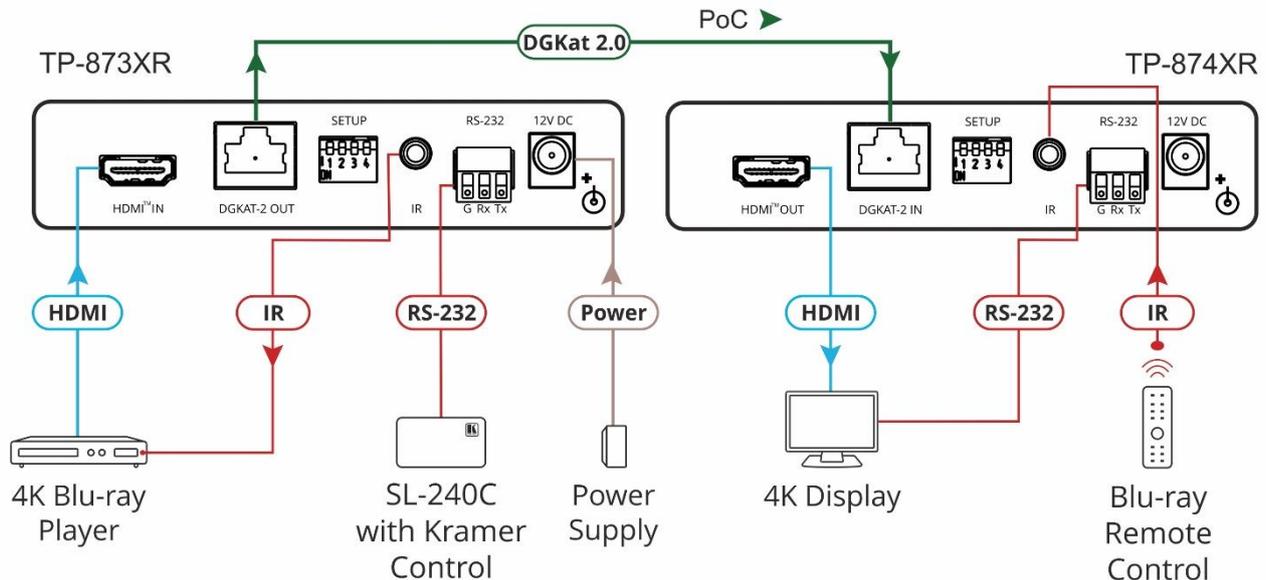

Figure 3: Connecting to the TP-873XR/TP-874XR Rear Panel

To connect the TP-873XR/TP-874XR as illustrated in the example in [Figure 3]:

1. On **TP-873XR**, connect an HDMI source (for example, a 4K Blu-ray player) to the HDMI™ IN connector ④.

2. On **TP-874XR**, connect the HDMI™ OUT connector ⑬ to an acceptor (for example, a 4K display).

3. Connect the **TP-873XR** DGKAT-2 OUT RJ-45 connector ⑤ to the **TP-874XR** DGKAT-2 IN RJ-45 connector ⑭.

4. Connect IR extension:

   ▪ On **TP-873XR** connect the IR 3.5mm mini jack ⑦ to an IR emitter and connect it to the Blu-ray IR sensor.

   ▪ On **TP-874XR** connect the IR 3.5mm mini jack ⑯ to an IR sensor.
   Point the Blu-ray IR remote control transmitter to that IR sensor to send commands to the Blu-ray player via DGKat 2.0.

5. Connect RS-232 extension:

   ▪ On **TP-873XR** connect a controller (for example, **SL-240C** room controller) to the RS-232 3-pin terminal block connector ⑧.

   ▪ On **TP-874XR** connect the RS-232 3-pin terminal block connector ⑰ to the display.

6. Connect the power adapter to the **TP-873XR** power connector ⑨ and to the mains electricity.

> ⓘ You can connect the power adapter to either the transmitter or the receiver since DGKat 2.0 passes power bidirectionally.
>
> This example shows the power adapter connected to **TP-873XR** but you can connect the power adapter to the receiver instead.

Connecting to TP-873XR/TP-874XR via RS-232

You can connect to the **TP-873XR**/**TP-874XR** via an RS-232 connection ⑬ using, for example, a PC.

The **TP-873XR**/**TP-874XR** features an RS-232 3-pin terminal block connector allowing the RS-232 to control the **TP-873XR**/**TP-874XR**.

Connect the RS-232 terminal block on the rear panel of the **TP-873XR**/**TP-874XR** to a PC/controller, as follows:
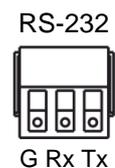
From the RS-232 9-pin D-sub serial port connect:

- Pin 2 to the TX pin on the **TP-873XR**/**TP-874XR** RS-232 terminal block

- Pin 3 to the RX pin on the **TP-873XR**/**TP-874XR** RS-232 terminal block

- Pin 5 to the G pin on the **TP-873XR**/**TP-874XR** RS-232 terminal block
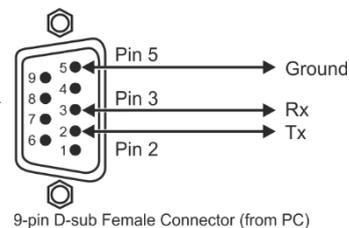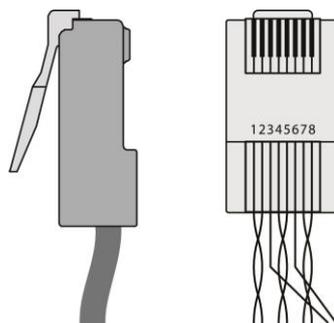

Wiring the RJ-45 Connectors

This section defines the CAT cable pinout, using a straight pin-to-pin cable with RJ-45 connectors.

> ⓘ For DGKAT cables, 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

> ⓘ We highly recommend using only Kramer UNIKAT cables with these products. If using 3rd party shielded CAT-6A cables, both ends of the shield must be soldered to the connectors for the products to function properly. Do not use any jumpers, unshielded wall plates or mid-span cable connections. These extenders are not compatible with HDBaseT technologies. Prior to signal extension, ensure that the extension line cable is lying straight and not coiled.

Setting the DIP-Switches

The DIP-switches are used to:

- Set the compression levels.

- Determine IR frequency mode.

- Enable RS-232 signal extension.

- Upgrade the firmware.

SETUP
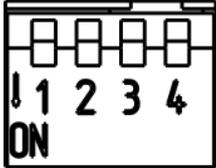
Figure 4: Setup DIP-Switches

(i) All the DIP-switches are set to **OFF** (up) by default.

#	Feature	DIP-switch Settings
1	Compression Options	OFF (up) – Standard compression level. ON (down) – High compression level for additional range extension.
2	IR Frequency Mode	OFF (up) – Frequency is 38kHz. ON (down) – Wide-range modulated IR frequency pass-through.
3	RS-232 Mode	OFF (up) – Serial extension. ON (down) – Serial device service mode.
4	FW Upgrade	OFF (up) – Normal operation mode. ON (down) – FW upgrade mode (DIP-switch 3 needs to be ON).

Technical Specifications

TP-873XR

Input	HDMI	On a female HDMI connector	
Output	DGKAT 2.0	On a female RJ-45 connector	
Port	RS-232	On a 3-pin terminal block connector for serial link extension	
	IR	On a 3.5mm mini-jack connector for IR link extension	

TP-874XR

Input	DGKAT 2.0	On a female RJ-45 connector	
Output	HDMI	On a female HDMI connector	
Port	RS-232	On a 3-pin terminal block connector for serial link extension	
	IR	On a 3.5mm mini-jack connector for IR link extension	

General

Video	Max Bandwidth	Up to 18Gbps (6Gbps per graphic channel)	
	Max Resolution	Standard compression level	4096x2160@60Hz (4:4:4) 24bpp
		High compression level	3840x2160@60Hz (4:4:4) 24bpp
	Compliance	HDCP 2.2, HDR 10	
Extension Range	Standard Compression Level	Up to 35m (110ft) at 4K@60Hz (4:4:4); Up to 70m (230ft) at 4K@60Hz (4:2:0) or full HD (1080p @60Hz 36bpp)	
	High Compression Level	When using shielded UNIKAT cables: Up to 50m (160ft) at 4K@60Hz (4:4:4); Up to 70m (230ft) at 4K@60Hz (4:2:0) or full HD (1080p @60Hz 36bpp) When using plenum HDKat cables: Up to 40m (130ft) at 4K@60Hz (4:4:4); Up to 50m (160ft) at 4K@60Hz (4:2:0) or full HD (1080p @60Hz 36bpp)	
	Compliance	DGKat 2.0	
Extended RS-232	Baud Rate	300 to 57600 baud	
Extended IR	Frequency	20kHz to 100kHz	
	Direction	Bidirectional (IR sensor or emitter)	
Controls	Front Panel	IN, OUT and ON LED indicators	
	Rear Panel	DIP-switches	
Power	Source	12V DC, 2A	
	Consumption	**TP-873XR** and **TP-874XR** (one device is connected to power, providing power to the other device): 12V, 0.87A	
Environmental Conditions	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	
Regulatory Compliance	Safety	CE	
	Environmental	RoHs, WEEE	
Enclosure	Size	Tool	
	Type	Aluminum	
	Cooling	Convection ventilation	
General	Net Dimensions	12cm x 7.2cm x 2.4cm (4.7" x 2.8" x 0.94") W, D, H, each	
	Shipping Dimensions	15.7cm x 12cm x 8.7cm (6.2" x 4.7" x 3.4") W, D, H	
	Net Weight (each)	0.25kg (0.6lbs) approx.	
	Shipping Weight	0.68kg (1.5lbs) approx.	
Accessories	Included	1 Power adapter, 1 power cord and 1 bracket set per device	
Specifications are subject to change without notice at www.kramerav.com			

The warranty obligations of Kramer Electronics Inc. ("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 this Coverage Lasts

The standard limited warranty for Kramer products is seven (7) years from the date of original purchase, with the following exceptions:

1. All Kramer VIA hardware products are covered by a standard three (3) year warranty for the VIA hardware and a standard three (3) year warranty for firmware and software updates; all Kramer VIA accessories, adapters, tags, and dongles are covered by a standard one (1) year warranty.

2. All Kramer fiber optic cables, adapter-size fiber optic extenders, pluggable optical modules, active cables, cable retractors, all ring mounted adapters, all Kramer speakers and Kramer touch panels are covered by a standard one (1) year warranty.

3. All Kramer Cobra products, all Kramer Calibre products, all Kramer Minicom digital signage products, all HighSecLabs products, all streaming, and all wireless products are covered by a standard three (3) year warranty.

4. All Sierra Video MultiViewers are covered by a standard five (5) year warranty.

5. Sierra switchers & control panels are covered by a standard seven (7) year warranty (excluding power supplies and fans that are covered for three (3) years).

6. K-Touch software is covered by a standard one (1) year warranty for software updates.

7. All Kramer passive cables are covered by a ten (10) year warranty.

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, visit our web site at www.kramerav.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 (RMA number). 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 of 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, visit our web site at www.kramerav.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.

KRAMER

⚠️ **SAFETY WARNING**
Disconnect the unit from the power supply before opening and servicing

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.

www.KramerAV.com
info@KramerAV.com