KRAMER

USER MANUAL
MODEL:

TP‑580TD, TP‑580RD
DVI Line Transmitter / 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.

Go to www.kramerav.com/downloads/TP-580TD 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‑580TD** and **TP‑580RD** 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.

Safety Instructions

Caution: There are no operator serviceable parts inside the unit

Warning: Use only the Kramer Electronics power supply that is provided with the unit

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

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‑580TD DVI Line Transmitter** and/or **TP‑580RD DVI Line Receiver**. **TP‑580TD** and **TP‑580RD** are a high-performance, long-reach **DVI Line Transmitter / Receiver** for 4K@60Hz (4:2:0) DVI/HDMI, RS-232 and IR signals over twisted pair. **TP‑580TD** and **TP‑580RD** extend video signals to up to 40m (130ft) over CAT copper cables at up to 4K@60Hz (4:2:0) 24bpp video resolution and provides even further reach for lower HD video resolutions. **TP‑580TD/TP‑580RD** can be connected to any market-available HDBaseT-compliant extension product.

- High Performance Standard Extender − Professional HDBaseT extender for providing long-reach signals over twisted-pair copper infrastructures. For optimum extension reach and performance, use recommended Kramer cables.

- Secured Operation — Highly-secured operation is ensured by lockable wiring connectivity with protection against unintentional cable disconnection.

- HDMI Signal Extension — HDMI 2.0 and HDCP 2.2 compliant, via single-link DVI-I connection. Supports deep color, x.v.Color™, lip sync, HDMI uncompressed audio channels, Dolby TrueHD, DTS-HD, 2K, 4K, and 3D. EDID signals are passed through from the source to the display.

- I-EDIDPro™ Kramer Intelligent EDID Processing™ — Intelligent EDID pass-through that 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 DVI and HDBT ports facilitate easy local maintenance and troubleshooting.

- Easy Installation — Compact DigiTOOLS® fan-less enclosure for dropped-ceiling mounting, or side-by-side mounting of 3 units in a 1U rack space. For more information on side-by-side mounting, go to www.kramerav.com/downloads/TP-580TD.

Typical Applications

TP‑580TD and **TP‑580RD** are ideal for the following typical applications:

- Medical operation rooms and other critical AV extension applications.

- Highly reliable, long-distance extension of high-quality professional AV signals via lockable cable connections.

- Governmental high-reliability AV extension applications.

- Rental and Staging events.
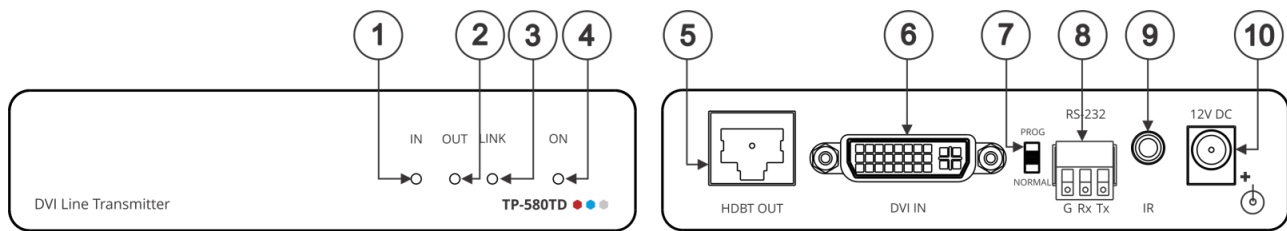
Defining the TP‑580TD DVI Line Transmitter

Figure 1: **TP‑580TD DVI Line Transmitter**

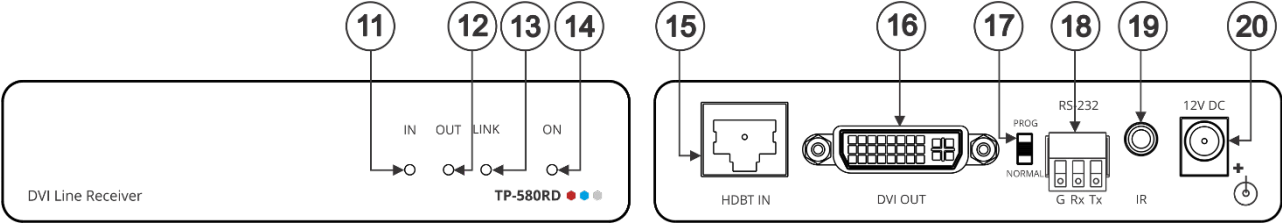| #	Feature	Function
1	IN LED	Lights green when an active DVI source device input signal is detected.
2	OUT LED	Lights green when an active, far-end sink (acceptor) DVI output signal is detected via the HDBaseT link (a DVI signal is detected from a sink device connected to the HDBaseT receiver that is connected to this output).
3	LINK LED	Lights green when an HDBT link is established with the HDBaseT receiver.
4	ON LED	Lights green when the device receives power.
5	HDBT OUT RJ-45 Connector	Connect to the HDBT IN connector on a receiver (for example, **TP‑580RD**).
6	DVI IN Connector	Connect to a DVI source.
7	PROG/NORMAL Switch	Slide to PROG to upgrade to the latest Kramer firmware via RS-232 or slide to NORMAL for normal operation.
8	RS-232 3-pin Terminal Block Connector	Connect to a laptop to control **TP‑580TD** or perform firmware upgrade. Connect to a controller device (for example, **SL-240C**) to serially control a remote device (for example, the DVI OUT acceptor) that is connected to **TP‑580RD**.
9	IR 3.5mm Mini Jack Connector	Connect to an external infrared emitter / sensor.
10	12V DC Power Connector	12V DC connector for powering the unit.

Defining the TP‑580RD DVI Line Receiver

Figure 2: **TP‑580RD DVI Line Receiver**

#	Feature	Function
11	IN LED	Lights green when an active far-end source DVI input signal is detected via the HDBaseT link (a DVI signal is detected from a source device connected to the HDBaseT transmitter that is connected to this input).
12	OUT LED	Lights green when an DVI output signal is detected.
13	LINK LED	Lights green when an HDBT link is established with the HDBaseT transmitter.
14	ON LED	Lights green when the device receives power.
15	HDBT IN RJ-45 Connector	Connect to the RJ-45 HDBT OUT connector on a transmitter (for example, **TP‑580TD**).
16	DVI OUT Connector	Connect to a DVI acceptor.
17	PROG/NORMAL Switch	Slide to PROG to upgrade to the latest Kramer firmware via RS-232 or slide to NORMAL for normal operation.
18	RS-232 3-pin Terminal Block Connector	Connect to a laptop to control **TP‑580RD** or perform firmware upgrade. Connect to a controlled device (for example, the DVI OUT acceptor) to control it from a remote serial controller (for example, **SL-240C**) that is connected to **TP‑580TD**.
19	IR 3.5mm Mini Jack Connector	Connect to an external infrared emitter / sensor.
20	12V DC Power Connector	12V DC connector for powering the unit.

Connecting the TP‑580TD, TP‑580RD DVI Line Transmitter / Receiver

⚠ Always switch off the power to each device before connecting it to your transmitter and receiver. After connecting your transmitter and receiver, connect their power and then switch on the power to each device.

You can use the **TP‑580TD DVI Line Transmitter** and the **TP‑580RD DVI Line Receiver** to configure an DVI transmitter/receiver system, as shown in the example in Figure 3.
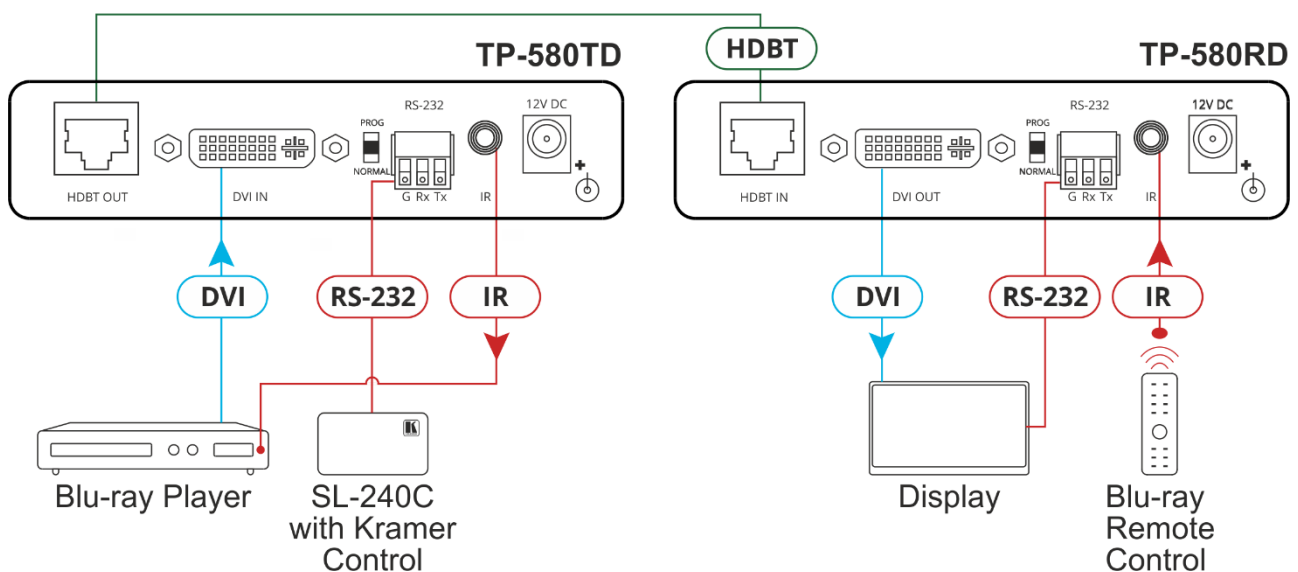
Figure 3: Connecting the TP‑580TD, TP‑580RD DVI Line Transmitter / Receiver

To connect the TP‑580TD, TP‑580RD DVI Line Transmitter / Receiver:

1. Connect a DVI source (for example, a Blu-ray player) to the DVI IN connector.

2. Connect the DVI OUT connector to the DVI acceptor, (for example, a display).

3. On the **TP‑580TD**, connect the RS-232 3-pin terminal block connector to the RS-232 port of a controller device (for example, the Kramer **SL-240C**).

4. On the **TP‑580RD**, connect the RS-232 3-pin terminal block to the device to be controlled, (for example, a display that is controlled by **SL-240C** which is connected to **TP‑580TD**).

5. On the **TP‑580TD**, connect the IR 3.5mm mini jack to an IR emitter that is connected to the IR-controlled device (for example, a Blu-ray player).

6. On the **TP‑580RD**, connect the 3.5mm mini jack to an IR sensor.

7. Connect the supplied power adapters to the power sockets of the **TP‑580TD** and **TP‑580RD**, and plug the adapters into the mains electricity (not shown in Figure 3).

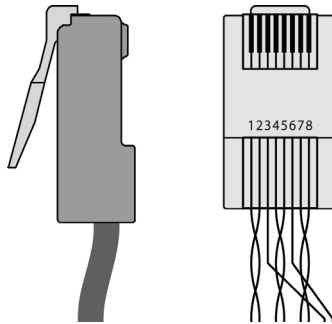# Wiring the HDBT RJ 45 Connectors

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

ⓘ Note, For HDBT cables, it is recommended that the cable ground shielding 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

Controlling A/V Equipment via an IR Remote Control

You can use an IR remote-control transmitter (that is used for controlling a peripheral device, for example, a Blu-ray disk player) to send commands from the receiver system to the transmitter or to send commands from the transmitter system to the receiver. To use an IR remote-control transmitter, connect the Kramer IR sensor cable at one end, and the Kramer IR emitter cable at the other end.

The example in <u>Figure 3</u> illustrates how to control a Blu-ray player that is connected to the **TP‑580TD** using a remote control located on the **TP‑580RD** side. An IR sensor is connected to the **TP‑580RD** and an IR emitter is connected between the **TP‑580TD** and the Blu-ray player. The Blu-ray remote control sends a command while pointed at the external IR sensor. The IR signal is passed over the HDBT link and the IR emitter connected to the Blu-ray player responds to the command sent.

Connecting to TP‑580TD, TP‑580RD via RS-232

The **TP‑580TD** and **TP‑580RD** each feature an RS-232 3-pin terminal block connector that can be used to:

- Extend serial communication data between serial-enabled devices that are connected to the **TP‑580TD** and **TP‑580RD**.

- Upgrade the firmware of the **TP‑580TD** and/or **TP‑580RD** using a Laptop, PC, or other serial-enabled controller devices.

Connect the RS-232 terminal block on the rear panel of the **TP‑580TD, TP‑580RD** to a PC/controller, as follows (see Figure 4):
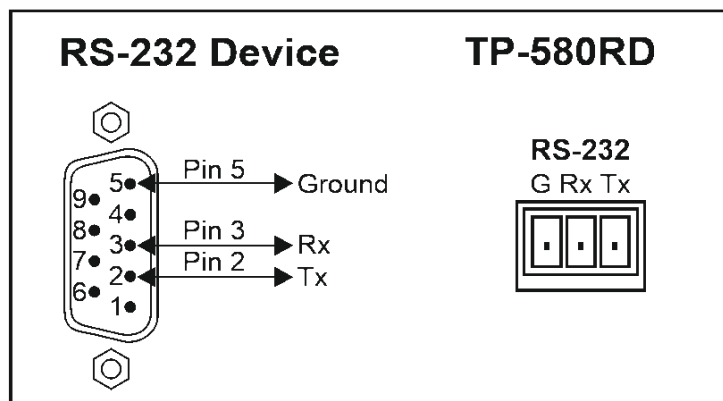
- TX pin to Pin 2

- RX pin to Pin 3

- GND pin to Pin 5

Figure 4: RS-232 Connection

Technical Specifications

TP‑580TD

Input	DVI-D/HDMI	On a DVI-I female connector
Output	HDBaseT	On an RJ-45 female connector

TP‑580RD

Input	HDBaseT	On an RJ-45 connector
Output	DVI-D/HDMI	On a female DVI-I connector

General

Ports	IR	On a 3.5mm mini jack for IR link extension
	RS-232	On a 3-pin terminal block for serial link extension and device firmware upgrade
Extension Line	Compliance	HDBaseT 1.0
	4K@60Hz (4:2:0) range	Up to 40m (130ft)
	Full HD (1080p @60Hz 36bpp) Range	Up to 70m (230ft)
Video	Max. Data Rate	10.2Gbps (3.4Gbps per graphic channel)
	Max. Supported Resolution	4K@60Hz (4:2:0) 24bpp
	Standards Compliance	HDMI 2.0 and HDCP 2.2
Extended RS-232	Baud Rate	300 to 115200
Control RS-232	Baud Rate	115200
Enclosure	Size	DigiTOOLS®
	Type	Aluminum
	Cooling	Convection ventilation
Power	Source	12V DC, 2A
	Consumption	**TP‑580TD**: 12V DC, 275mA
		TP‑580RD: 12V DC, 450mA
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
General	Product Dimensions	12.00cm x 7.15cm x 2.44cm (4.72" x 2.81" x 0.96") W, D, H
	Product Weight	0.3kg (0.6lbs) approx.
	Shipping Dimensions	15.70cm x 12.00cm x 8.70cm (6.18" x 4.72" x 3.43") W, D, H
	Shipping Weight	0.7kg (1.5lbs) approx.
Accessories	Included	1 Power adapter and cord per unit

Specifications are subject to change without notice at www.KramerAV.com.

The terms HDMI, HDMI High-Definition Multimedia Interface, and the HDMI Logo are trademarks or registered trademarks of HDMI Licensing Administrator, Inc.

Default Communication Parameters

RS-232	
Baud Rate:	115,200
Data Bits:	8
Stop Bits:	1
Parity:	None

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Technical Specifications

TP‑580TD

Input	DVI-D/HDMI	On a DVI-I female connector
Output	HDBaseT	On an RJ-45 female connector

TP‑580RD

Input	HDBaseT	On an RJ-45 connector
Output	DVI-D/HDMI	On a female DVI-I connector

General

Ports	IR	On a 3.5mm mini jack for IR link extension
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Enclosure	Size	DigiTOOLS®
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Default Communication Parameters

RS-232	
Baud Rate:	115,200
Data Bits:	8
Stop Bits:	1
Parity:	None

TP‑580TD, TP‑580RD – Technical Specifications   9

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.
2. All Kramer fiber optic cables, adapter-size fiber optic extenders, active cables, cable retractors, 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.

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

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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