



KRAMER ELECTRONICS LTD.

# USER MANUAL

MODELS:

**WP-110**, XGA Line Transmitter

**PT-120**, XGA Line Receiver

**TP-120**, XGA Line Receiver

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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 wall plate **WP-110 XGA Line Transmitter**, Kramer Pico TOOLS **PT-120 XGA Line Receiver**, and/or Kramer TOOLS **TP-120 XGA Line Receiver**, which are ideal for:

- Presentation and multimedia applications
- Long-range graphics distribution for schools, hospitals, security, and stores

## 2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high performance high resolution cables



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 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 **WP-110**, **PT-120** or **TP-120** away from moisture, excessive sunlight and dust



**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

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## 3 Overview

This section describes:

- A summary of the **WP-110 XGA Line Transmitter**, see [Section 3.1](#)
- A summary of the **PT-120 XGA Line Receiver**, see [Section 3.2](#)
- A summary of the **TP-120 XGA Line Receiver**, see [Section 3.3](#)
- The power connect feature, see [Section 3.4](#)
- Using shielded twisted pair (STP) / unshielded twisted pair (UTP), see [Section 3.5](#)

### 3.1 WP-110 XGA Line Transmitter

The Kramer Wall Plate **WP-110** is an XGA line transmitter that receives an XGA signal and transmits it over a CAT 5 cable to the **PT-120** or **TP-120** receiver. The **WP-110** is available in three versions: one for USA, one for Belgium and Germany, and one for UK and most of Europe (excluding Belgium and Germany). In particular, the **WP-110**:

- Has a resolution of up to UXGA
- Can use the simplest UTP CAT 5 cables, however, it benefits from better quality cables
- Has the power connect feature and is 12V DC fed

### 3.2 PT-120 XGA Line Receiver

The Kramer Pico TOOLS **PT-120** is an XGA line receiver that receives a coded CAT 5 signal transmitted by the **WP-110**, decodes it and converts it to an XGA output. In particular, the **PT-120**:

- Has an operating range of more than 300ft (more than 100m) using standard CAT 5 cable and the **WP-110**
- Includes EQ. and level controls
- Has the power connect feature and is 12V DC fed

### 3.3 TP-120 XGA Line Receiver

The Kramer TOOLS **TP-120** is an XGA line receiver that receives a coded CAT 5 signal transmitted by the **WP-110**, decodes it and converts it to an XGA output. In particular, the **TP-120**:

- Has an operating range of more than 300ft (more than 100m) using standard CAT 5 cable and the **WP-110**
- Includes EQ. and level controls
- Has the power connect feature and is 12V DC fed

### 3.4 About the Power Connect™ Feature

The Power Connect feature applies as long as the cable can carry power. This feature is available when using STP cable and the distance does not exceed 50m (164ft) on standard CAT 5 cable. For longer distances, heavy gauge cable should be used (TP cable is still suitable for the video/audio transmission, but not for feeding the power at these distances). For units which are connected via RJ-45 connectors, make sure that the shield of the STP cable is connected to the metal casing of the connectors on both ends of the cable. For units which are connected via terminal block connectors, the shield of the STP cable must be connected to a ground terminal on the units at both ends (use the ground terminal of the power supply connection if necessary).

For a TP cable exceeding a distance of 50m, separate power supplies should be connected to the transmitter and to the receiver simultaneously.

### 3.5 Shielded Twisted Pair (STP) / Unshielded Twisted Pair (UTP)

We recommend that you use Shielded Twisted Pair (STP) cable, and stress that the compliance to electromagnetic interference was tested using STP cable. There are different levels of STP cable available, and we advise you to use the best quality STP cable that you can afford. Our non-skew-free cable, Kramer **BC-STP** is intended for analog signals where skewing is not an issue.

In cases where there is skewing, our Unshielded Twisted Pair (UTP) skew-free cable, Kramer **BC-XTP**, may be advantageous, and UTP cable might also be preferable for long range applications. In any event when using UTP cable, it is advisable to ensure that the cable is installed far away from electric cables, motors and so on, which are prone to create electrical interference.

## 4 Your XGA Line Transmitter(s) / Receiver

This section defines the XGA Line Transmitter(s)/Receiver:

- **WP-110** XGA Line Transmitter (see [Section 4.1](#))
- **PT-120** XGA Line Receiver (see [Section 4.2](#))
- **TP-120** XGA Line Receiver (see [Section 4.3](#))

### 4.1 Your WP-110 XGA Line Transmitter

The **WP-110** is available in three versions: US, Belgium and Germany, and UK and most of Europe (excluding Belgium and Germany), as defined in [Figure 1](#):

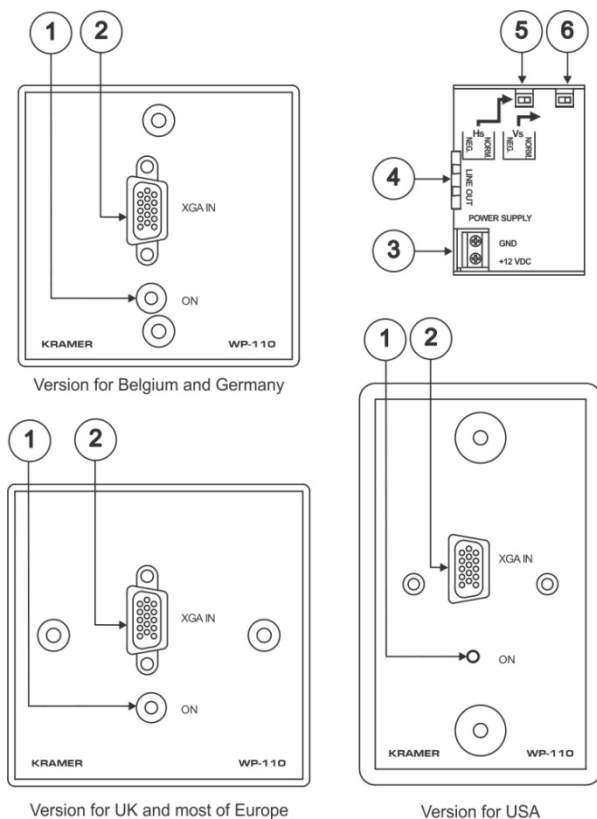


Figure 1: WP-110 XGA Line Transmitter



#	Feature	Function
1	ON LED	Illuminates when receiving power
2	XGA IN 15-pin HD (F) Connector	Connect to the XGA source
3	POWER SUPPLY	GND PIN Connect (-) to the Ground
		+12V DC PIN Connect (+) to the connector for powering the unit
4	LINE OUT RJ-45 Connector	Connects to the <i>LINE IN</i> RJ-45 connector on the <b>PT-120</b> or <b>TP-120 XGA Line Receiver</b>  Use a UTP cable with CAT 5 connectors at both ends (the PINOUT is defined in <a href="#">Figure 5</a> )
5	HS Switch	Slide the switch to the left (by default, both switches are set to the right) to change the HS (horizontal sync) polarity to (NEG.) negative polarity (down-going syncs); slide the switch to the right (NORM.) to retain the polarity
6	VS Switch	Slide the switch to the left to change the VS (vertical sync) polarity to (NEG.) negative polarity; slide the switch to the right (NORM.) to retain the polarity

## 4.2 Your PT-120 XGA Line Receiver

[Figure 2](#) defines the **PT-120 XGA Line Receiver**:

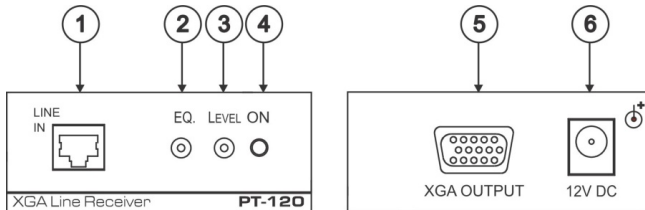


Figure 2: PT-120 XGA Line Receiver

#	Feature	Function
1	LINE IN RJ-45 Connector	Connects to the <i>LINE OUT</i> RJ-45 connector on the <b>WP-110 XGA Line Receiver</b>  Using a UTP cable with CAT 5 connectors at both ends (the PINOUT is defined in <a href="#">Figure 5</a> )
2	EQ. Trimmer	Adjusts the cable compensation equalization level  Degradation and VGA/XGA signal loss can result from using long cables (due to stray capacitance), sometimes leading to a total loss of sharpness in high-resolution signals
3	LEVEL Trimmer	Adjusts the output signal level  Use a screwdriver to carefully rotate the trimmer, adjusting the appropriate level
4	ON LED	Illuminates when receiving power
5	XGA OUTPUT 15-pin HD (F) Connector	Connect to the XGA acceptor
6	12V DC	+12V DC connector for powering the unit

### 4.3 Your TP-120 XGA Line Receiver

Figure 3 defines the **TP-120 XGA Line Receiver**.

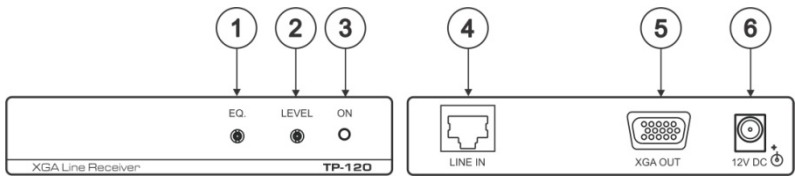


Figure 3: TP-120 XGA Line Receiver

#	Feature	Function
1	<i>EQ</i> Trimmer	Adjusts the cable compensation equalization level
2	<i>LEVEL</i> Trimmer	Adjusts the output signal level
3	<i>ON</i> LED	Illuminates when receiving power
4	<i>LINE IN</i> RJ-45 Connector	Connects to the <i>LINE OUT</i> RJ-45 connector on the <b>WP-110 XGA Line Receiver</b>
5	<i>XGA OUT</i> 15-pin HD (F) Connector	Connect to the XGA acceptor
6	<i>12V DC</i>	+12V DC connector for powering the unit

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## 5 Using the XGA Line Transmitter(s)/Receiver

You can use the **WP-110 XGA Line Transmitter** and the **TP-120 XGA Line Receiver** to configure an XGA-to-twisted pair transmitter and receiver system.

### 5.1 Installing the WP-110 XGA Line Transmitter

To install your **WP-110 XGA Line Transmitter**:

1. Connect the LINE OUT RJ-45 connector to the pre-installed UTP wiring in the wall box opening that connects via UTP cabling to the LINE IN RJ-45 connector of the **PT-120** or **TP-120**.
2. Connect your 12V DC power supply to the POWER SUPPLY pins, taking care that **polarity is correct**.  
Connect the wire labeled “+” to the +12V pin, and the wire labeled “-” to the GND pin.
3. Insert the **WP-110** directly into the wall box opening, and then mount the front panel securely using the screws.
4. Connect the XGA source to the XGA IN 15-pin HD (F) connector.

### 5.2 Connecting the WP-110 to the TP-120

To connect the **WP-110 XGA Line Transmitter** to the **TP-120 XGA Line Receiver**, as the example in [Figure 4](#) illustrates, do the following:

1. On the **WP-110**, connect the XGA source (for example, the 15-pin HD output from a computer's graphics card) to the XGA INPUT 15-pin HD (F) connector.
2. On the **TP-120**, connect the XGA OUT 15-pin HD (F) connector to the XGA acceptor (for example, a monitor).
3. Connect the LINE OUTPUT RJ-45 connector on the **WP-110** to the LINE IN RJ-45 connector on the **TP-120**, via UTP cabling (with a range of more than 300ft (>100m)).
4. On both the **WP-110** and the **TP-120**, connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity.  
The signal from the XGA source is transmitted via CAT 5 cable, decoded

and converted at the XGA OUT 15-pin HD (F) connector to the XGA acceptor.

For details of the power connect feature see [Section 3.4](#).

5. On the **TP-120**, using a screwdriver to carefully rotate the trimmer, adjust the output signal level and/or cable compensation equalization level, if required.
6. If necessary, set the H SYNC and V SYNC switches, on the underside of the **WP-110**.  
By default, both switches are set for normal H SYNC and V SYNC polarity.

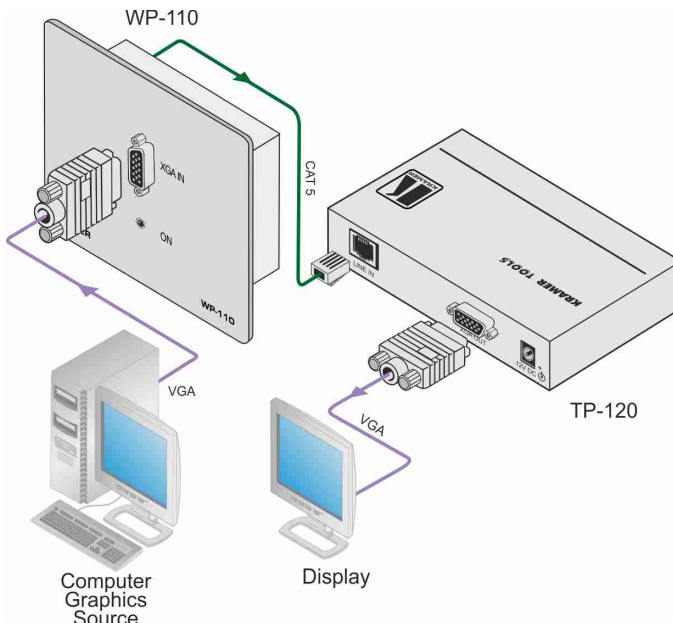


Figure 4: Connecting the WP-110 to a TP-120

### 5.3 Wiring the CAT 5 LINE IN / LINE OUT RJ-45 Connectors

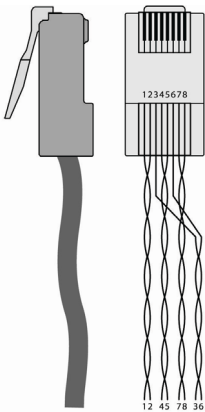
This section defines the CAT 5 pinout, using a straight pin-to-pin cable with RJ-45 connectors.



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 5: CAT 5 PINOUT



## 6 Technical Specifications

	WP-110	PT-120	TP-120
INPUTS:	1 VGA/UXGA on a 15-pin HD connector	1 RJ-45 LINE IN connector	1 RJ-45 LINE IN connector
OUTPUTS:	1 RJ-45 LINE OUT connector	1 VGA / UXGA on a 15-pin HD connector	1 VGA / UXGA on a 15-pin HD connector
MAX. OUTPUT LEVEL:		1.5Vpp	1.4Vpp
RESOLUTION:	Up to UXGA		
DIFF. GAIN:	2.9% (worst case) (for the transmitter/receiver pair)		
DIFF. PHASE	0.3Deg (worst case) “		
K-FACTOR:	<0.05% “		
S/N RATIO:	69dB (worst case) “		
CONTROLS:		Level: -7.7dB to +3.1dB, 130m; EQ: 0dB to +25dB @50MHz	Level: -7.5dB to +4.4dB, 130m, EQ: 0dB to +33dB @50MHZ
COUPLING:	AC	DC	AC
POWER SOURCE:	12V DC, 230mA max.	12V DC, 260mA max.	12V DC, 230mA max.
OPERATING TEMPERATURE:		0° to +55°C (32° to 131°F)	
STORAGE TEMPERATURE:		-45° to +72°C (-49° to 162°F)	
HUMIDITY:		10% to 90%, RHL non-condensing	
DIMENSIONS:	USA: 6.9cm x 3.8cm x 11.4cm (2.72" x 1.5" x 4.5") W, D, H	6cm x 6.5cm x 2.5cm (2.36" x 2.56" x 1") W, D, H	12cm x 7.5cm x 2.5cm (4.7" x 0.98" x 2.95") W, D, H
	Belgium and Germany: 8cm x 3.8cm x 8cm (3.15" x 1.5" x 3.15") W, D, H		
	UK and most of Europe (excluding Germany and Belgium): 8.6cm x 3.8cm x 8.6cm (3.39" x 1.5" x 3.39") W, D, H		
WEIGHT:	0.14kg (0.31lbs) approx.	0.14kg (0.31lbs) approx.	0.3kg (0.66lbs) approx.
ACCESSORIES:	Power supply		
OPTIONS:	19-inch rack adapters		
The power source was measured using a pair of units (transmitter and receiver). Specifications are subject to change without notice at <a href="http://www.kramerelectronics.com">http://www.kramerelectronics.com</a>			

## 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@kramere1.com](mailto:info@kramere1.com)



#### **SAFETY WARNING**

Disconnect the unit from the power supply before opening and servicing