



KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

905xl
Power Amplifier

P/N: 2900-300196 Rev 3

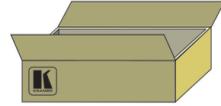


905xl Quick Start Guide

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 the contents of the box

- 905xl Power Amplifier
- 1 Power cord
- 1 Set of rack "ears"
- 1 Quick Start Guide
- 4 Rubber Feet



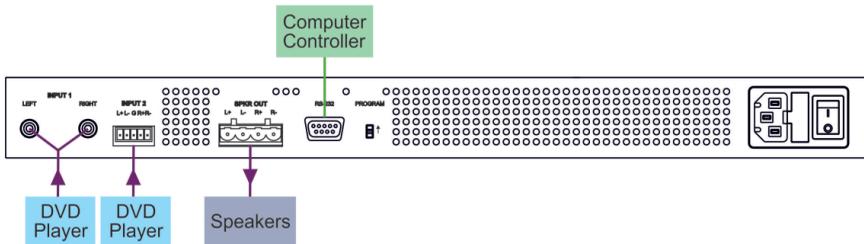
Save the original box and packaging in case your 905xl needs to be returned to the factory for service.

Step 2: Install the 905xl

Mount the device in a rack (using the included rack "ears") or attach the rubber feet and place it on a shelf.

Step 3: Connect the inputs and output

Always switch off the power to all devices before connecting them to your 905xl.



Always use Kramer high-performance cables for connecting AV equipment to the 905xl.

Step 4: Connect the power

Connect the power cord to the 905xl and plug it into the mains electricity.



Step 5: Operate the 905xl

- Select an input
- Adjust the volume

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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 Video Products.

Congratulations on purchasing your Kramer **905xl** *Power Amplifier*, which is ideal for the following typical applications:

- Presentation rooms and multimedia applications for quick, local audio amplification
- Personal audio listening (for example, a PC and portable CD player)

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual



Go to <http://www.kramerelectronics.com> to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

2.1 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Do not secure the cables in tight bundles or roll the slack into tight coils
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality
- Position your **905xl** 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 power cord that is supplied with the unit

Warning: Do not open the unit. High voltages can cause electrical shock! Servicing by qualified personnel only

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 **905xl** is a high quality power amplifier for stereo audio signals. It accepts either a stereo audio signal on RCA connectors or a balanced stereo audio signal on a terminal block connector. It delivers a speaker output of 110 watts RMS per channel into a 4Ω load on a 10A 4 pin terminal block connector.

In particular, the **905xl** features:

- An unbalanced, stereo input on RCA connectors
- A balanced, stereo input on a terminal block connector
- Two input selector buttons
- Volume control buttons
- A mute button
- Bass, treble, midrange, volume, balance and loudness controls (via software)
- An RS-232 serial control port

You can control the **905xl** using the front panel buttons, or remotely via RS-232 serial commands transmitted by a PC, touch screen system or other serial controller.

4 Defining the 905xl Power Amplifier

Figure 1 defines the front and rear panels of the 905xl.

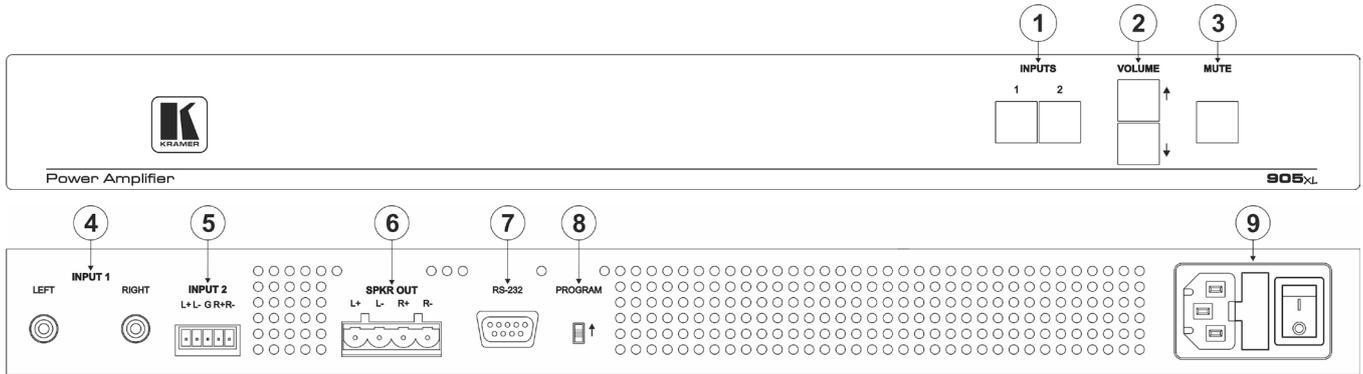


Figure 1: 905xl Power Amplifier Front and Rear Panels

#	Feature	Function
1	INPUTS 1 and 2 Buttons	Press to select input audio source 1 (unbalanced) or 2 (balanced)
2	VOLUME ↑ and ↓ Buttons	Press to increase or decrease the output volume
3	MUTE Button	Press to mute the audio output (the button lights). Press again to unmute the audio output (see Section 7.1.2)
4	INPUT 1	
	LEFT RCA Connector	Connect to the left channel of the unbalanced, stereo audio source (see Section 6)
	RIGHT RCA Connector	Connect to the right channel of the unbalanced, stereo audio source (see Section 6)
5	INPUT 2 5-pin Terminal Block Audio Input	Connect to the left and right channels of the balanced, stereo audio source
6	SPKR OUT 4-pin Terminal Block Speaker Output	Connect to the left and right channels of a balanced, stereo acceptor (speakers)
7	RS-232 9-pin D-sub Serial Port Connector	Connect to a PC/serial controller (see Section 6.1)
8	PROGRAM Switch	Switch up to perform firmware upgrades. Leave down for normal operation
9	Mains Power Connector, Fuse and Power Switch	Plug in the power cord and switch the device on and off

5 Installing in a Rack

This section provides instructions for rack mounting the unit.

Before installing in a rack, be sure that the environment is within the recommended range:

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



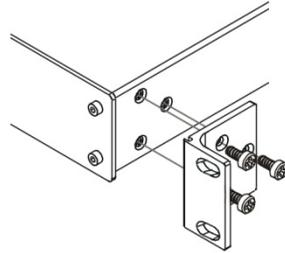
CAUTION!

When installing on a 19" rack, avoid hazards by taking care that:

1. It is located within the recommended environmental conditions, as the operating ambient temperature of a closed or multi unit rack assembly may exceed the room ambient temperature.
2. Once rack mounted, enough air will still flow around the machine.
3. The machine is placed straight in the correct horizontal position.
4. You do not overload the circuit(s). When connecting the machine to the supply circuit, overloading the circuits might have a detrimental effect on overcurrent protection and supply wiring. Refer to the appropriate nameplate ratings for information. For example, for fuse replacement, see the value printed on the product label.
5. The machine is earthed (grounded) in a reliable way and is connected only to an electricity socket with grounding. Pay particular attention to situations where electricity is supplied indirectly (when the power cord is not plugged directly into the socket in the wall), for example, when using an extension cable or a power strip, and that you use only the power cord that is supplied with the machine.

To rack-mount a machine:

1. Attach both ear brackets to the machine. To do so, remove the screws from each side of the machine (3 on each side), and replace those screws through the ear brackets.



2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

Note:

- In some models, the front panel may feature built-in rack ears
- Detachable rack ears can be removed for desktop use
- Always mount the machine in the rack before you attach any cables or connect the machine to the power
- If you are using a Kramer rack adapter kit (for a machine that is not 19"), see the Rack Adapters user manual for installation instructions available from our Web site

6 Connecting the 905xl Power Amplifier



Always switch off the power to all devices before connecting them to your **905xl**. After connecting your **905xl**, connect its power and then switch on the power to each device.

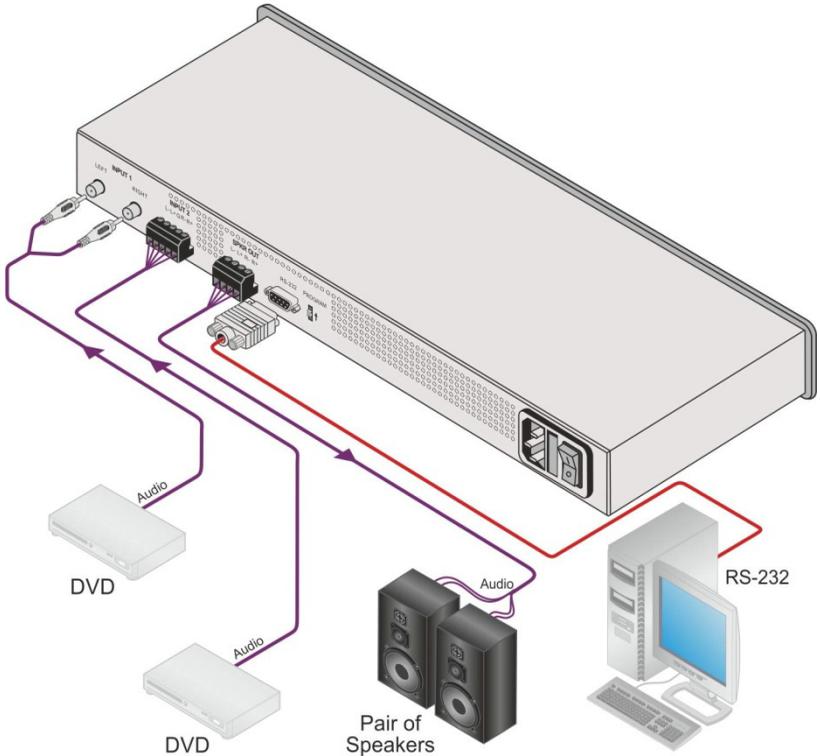


Figure 2: Connecting the 905xl Power Amplifier

To connect the **905xl Power Amplifier** as illustrated in the example in [Figure 2](#):

1. Connect an unbalanced stereo audio source (for example, the unbalanced output of a DVD player) to the Input 1 L and R RCA connectors.
2. Connect a balanced stereo audio source (for example, the balanced stereo audio output of a DVD player) to the Input 2 terminal block connector.

3. Connect the Output terminal block to a pair of speakers.
Connect the “L+” and the “L-” terminal block connectors to the left speaker, and the “R+” and the “R-” terminal block connectors to the right speaker.
Do not ground the loudspeakers.
4. Connect the power cord to the power socket and connect the cord to the mains electricity (not shown in [Figure 2](#)).
5. If required, connect a PC and/or controller to the RS 232 port, (see [Section 6.1](#)).

6.1 Connecting to the 905xl via RS-232

You can connect to the **905xl** via an RS-232 connection using, for example, a PC. Note that a null-modem adapter/connection is not required.

To connect to the **905xl** via RS-232:

- Connect the RS-232 9-pin D-sub rear panel port on the 905xl 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

7 Operating the 905xl Power Amplifier

You can operate your **905xl** using:

- The front panel buttons (see [Section 7.1](#))
- The Audio Control program (see [Section 7.2](#))
- RS-232 serial commands (see [Section 10](#))

7.1 Using the Front Panel Buttons

7.1.1 Adjusting the Volume

To adjust the volume of the output signal:

1. Press the up volume button (▲) to increase the volume.
2. Press the down volume button (▼) to decrease the volume.

7.1.2 Muting the Output

To mute the output:

- Press the Mute button.
The button lights and the audio is muted

To turn on the output:

- Press the Mute button.
The button no longer lights and the audio is unmuted at the previous volume level

7.2 Using the Audio Control Program

The **905xl** Audio Control program allows you to adjust the volume and to operate equalization controls for treble, mid-level and bass which cannot be adjusted from the front panel.

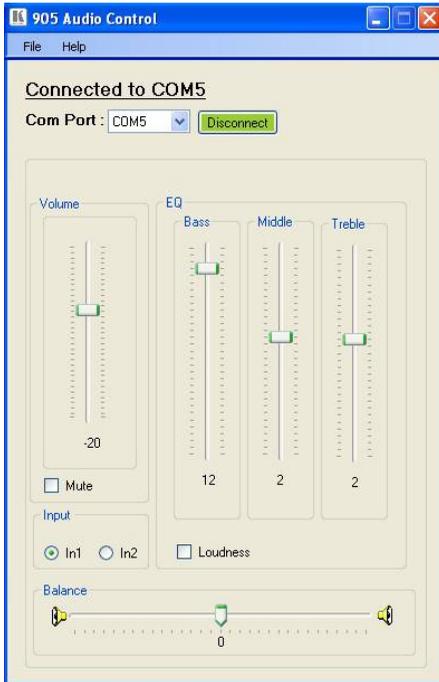


Figure 3: Audio Control Window

To use the Audio Control Program:

1. Download and install the program on your PC from <http://www.kramerelectronics.com>.
2. Connect the **905xl** to the correct COM port of the PC (see [Section 6](#)).
3. Open the Audio Control program.
The Audio Control window appears (see [Figure 3](#)).
4. Select Input 1 or 2.
5. Make volume, equalization and balance adjustments by dragging the sliders in the window.
6. Turn loudness on and off by checking or unchecking the Loudness checkbox.

7.3 Upgrading the Firmware

For instructions on upgrading the firmware see “*Upgrading the 905xl Firmware Using the FLIP Software*”.

8 Technical Specifications

INPUTS:	1 Unbalanced stereo audio input on RCA connectors 1 Balanced stereo audio input on a 5-pin terminal block connector
OUTPUT:	1 Speaker stereo audio output on a 4-pin terminal block connector
INPUT SENSITIVITY:	760mVpp (unbalanced), 1.2Vpp (balanced)
OUTPUT POWER:	55 W per channel into 8 Ω , 10W per channel into 4 Ω
MAX. VOLTAGE GAIN:	8 Ω : 49dB (unbalanced), 45dB (balanced) 4 Ω : 47dB (unbalanced), 44dB (balanced)
OUTPUT MUSIC POWER:	300W per channel into 4 Ω
BANDWIDTH (-3dB):	>26kHz
S/N RATIO:	80dB
CROSSTALK:	-120dB @1kHz -111dB @20kHz
CONTROLS:	Bass: -15dB to 14dB @100Hz Mid: -13.7dB to 13.7dB @1kHz Treble: -13.7dB to 13.8dB @10kHz Balance: -46.9dB to 0dB Volume: -80dB to 32dB @1kHz
ADDITIONAL CONTROLS:	Loudness: -9dB @500Hz -9dB @1kHz -8.5dB @15kHz
COUPLING:	Input: AC, Output: DC
AUDIO THD + NOISE:	<1% @1kHz, 1V
AUDIO 2nd HARMONIC:	<0.1% @1kHz
AMPLIFIER TYPE:	Class D
POWER CONSUMPTION:	220/110V AC, 50/60Hz, 510VA
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:	19" x 7.24" x 1U (W, D, H)
WEIGHT:	1.6kg (3.53lbs) approx.
ACCESSORIES:	Power cord, rack "ears"
Specifications are subject to change without notice at http://www.kramerelectronics.com	

9 Default Communication Parameters

RS-232	
Baud Rate:	9600
Data Bits:	8
Stop Bits:	1
Parity:	None
Command Format:	ASCII
Example (Switch to Input 1):	#AUD-IN 1<CR>

10 Protocol 3000

The **905xl** can be operated using serial commands from a PC, remote controller or touch screen using the Kramer Protocol 3000.

This section describes:

- Kramer Protocol 3000 syntax (see [Section 10.1](#))
- Kramer Protocol 3000 commands (see [Section 10.2](#))

10.1 Kramer Protocol 3000 Syntax

10.1.1 Host Message Format

Start	Address (optional)	Body	Delimiter
#	Destination_id@	Message	CR

10.1.1.1 Simple Command

Command string with only one command without addressing:

Start	Body	Delimiter
#	Command SP Parameter_1,Parameter_2,...	CR

10.1.1.2 Command String

Formal syntax with command concatenation and addressing:

Start	Address	Body	Delimiter
#	Destination_id@	Command_1 Parameter1_1,Parameter1_2,...] Command_2 Parameter2_1,Parameter2_2,...] Command_3 Parameter3_1,Parameter3_2,...]...	CR

10.1.2 Device Message Format

Start	Address (optional)	Body	delimiter
~	Sender_id@	Message	CR LF

10.1.2.1 Device Long Response

Echoing command:

Start	Address (optional)	Body	Delimiter
~	Sender_id@	Command SP [Param1 ,Param2 ...] result	CR LF

CR = Carriage return (ASCII 13 = 0x0D)

LF = Line feed (ASCII 10 = 0x0A)

SP = Space (ASCII 32 = 0x20)

10.1.3 Command Terms

Command

A sequence of ASCII letters ('A'-'Z', 'a'-'z' and '-').

Command and parameters must be separated by at least one space.

Parameters

A sequence of alphanumeric ASCII characters ('0'-'9', 'A'-'Z', 'a'-'z' and some special characters for specific commands). Parameters are separated by commas.

Message string

Every command entered as part of a message string begins with a **message starting character** and ends with a **message closing character**.

Note: A string can contain more than one command. Commands are separated by a pipe ('|') character.

Message starting character

'#' – For host command/query

'~' – For device response

Device address (Optional, for K-NET)

K-NET Device ID followed by '@'

Query sign

'?' follows some commands to define a query request.

Message closing character

CR – For host messages; carriage return (ASCII 13)

CRLF – For device messages; carriage return (ASCII 13) + line-feed (ASCII 10)

Command chain separator character

When a message string contains more than one command, a pipe ('|') character separates each command.

Spaces between parameters or command terms are ignored.

10.1.4 Entering Commands

You can directly enter all commands using a terminal with ASCII communications software, such as HyperTerminal, Hercules, etc. Connect the terminal to the serial or Ethernet port on the Kramer device. To enter **CR** press the Enter key. (**LF** is also sent but is ignored by command parser).

For commands sent from some non-Kramer controllers like Crestron, some characters require special coding (such as, /X##). Refer to the controller manual.

10.1.5 Command Forms

Some commands have short name syntax in addition to long name syntax to allow faster typing. The response is always in long syntax.

10.1.6 Chaining Commands

Multiple commands can be chained in the same string. Each command is delimited by a pipe character (“|”). When chaining commands, enter the **message starting character** and the **message closing character** only once, at the beginning of the string and at the end.

Commands in the string do not execute until the closing character is entered.

A separate response is sent for every command in the chain.

10.1.7 Maximum String Length

64 characters

10.2 Kramer Protocol 3000 Commands

Command	Description
#	Protocol handshaking
AUD-IN	Switch audio only
AUD-IN?	Read audio only
AUD	Switch audio only
AUD?	Read audio only
VOLUME	Set simple audio volume
VOLUME?	Read simple audio level
VOLUME+	Increment audio volume
VOLUME-	Decrement audio volume

Command	Description
BASS	Set audio bass level
BASS?	Read audio bass level
TREBLE	Set audio treble level
TREBLE?	Read audio treble
MIDRANGE	Set audio midrange level
MIDRANGE?	Read audio midrange level
LOUDNESS	Set audio loudness
LOUDNESS?	Read audio loudness
MUTE	Mute audio
MUTE?	Reads mute state
BALANCE	Set balance mode
BALANCE?	Reads balance mode

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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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

E-mail: info@kramerel.com



SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing



P/N: 2900-300196



Rev: 3