

**Kramer Electronics, Ltd.**



# **USER MANUAL**

**Model:**

**900xl**

*Power Amplifier*

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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<sup>1</sup> that are clearly defined by function.

Thank you for purchasing the Kramer TOOLS **900x1** *Power Amplifier*, which is ideal for:

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

The package includes the following items:

- **900x1** Power Amplifier
- 12V DC power supply
- This user manual<sup>2</sup>

## 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<sup>3</sup>

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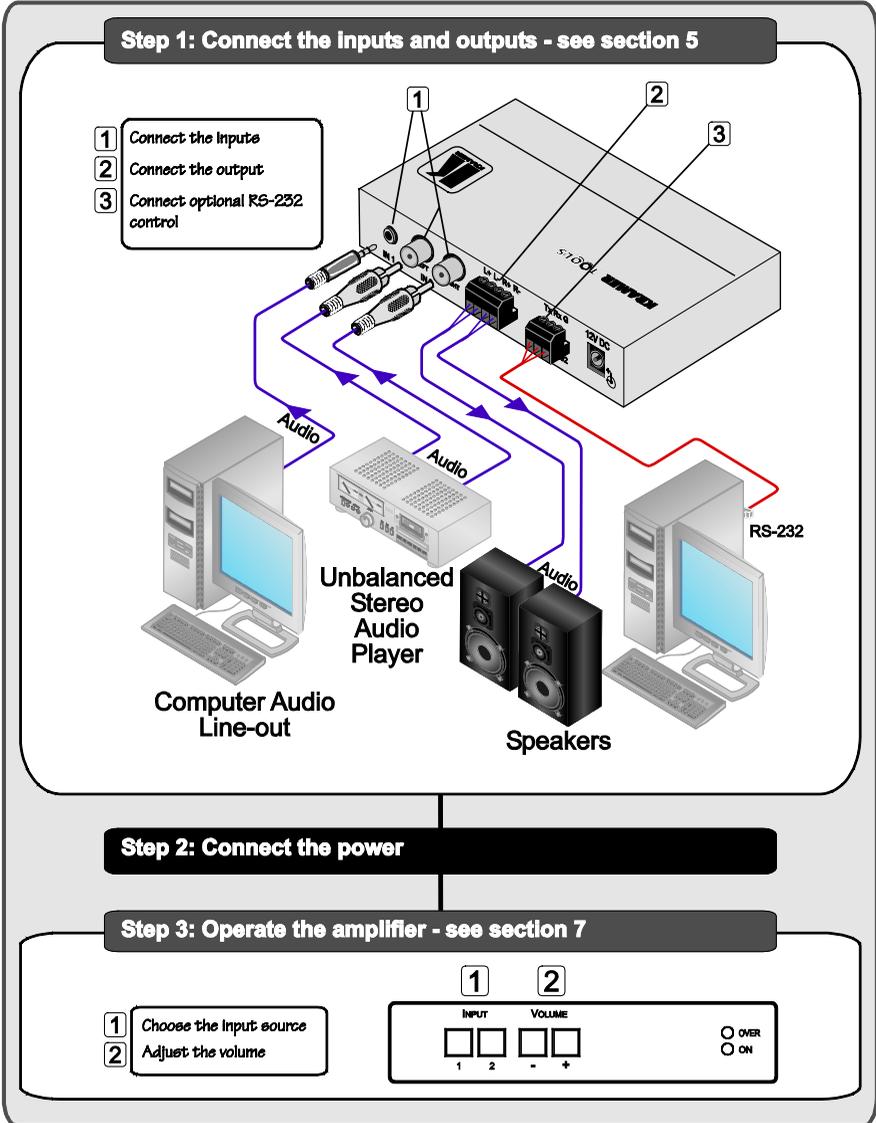
1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

2 Download up-to-date Kramer user manuals from our Web site at <http://www.kramerelectronics.com>

3 The complete list of Kramer cables is on our Web site at <http://www.kramerelectronics.com>

## 2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.



### 3 Overview

The Kramer **900xl** is a high-performance power amplifier for line-level stereo audio signals. It accepts either a stereo audio signal on an RCA connector or a stereo audio signal on a 3.5mm mini jack. It delivers a speaker output of 10 watts RMS per channel into a 4 $\Omega$  load on a 10A 4-pin terminal block connector.

The **900xl** includes:

- Input selector buttons
- Audio gain buttons for volume control
- Overheating warning protection with LED indicator
- A 12V DC power source

The **900xl** is housed in a Kramer TOOLS enclosure.

To achieve the best performance:

- Use only good quality connection cables<sup>1</sup> to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables).
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer **900xl** away from moisture, excessive sunlight and dust

	<b>Caution:</b> No operator serviceable parts inside unit
	<b>Warning:</b> Use only the Kramer Electronics input power wall adapter that is provided with the unit
	<b>Warning:</b> Disconnect power and unplug unit from wall before installing or removing the device or servicing unit

<sup>1</sup> Available from Kramer Electronics on our Web site at <http://www.kramerelectronics.com>

## 4 Your 900xl Power Amplifier

[Figure 1](#), [Figure 2](#), [Table 1](#), and [Table 2](#) define the unit.

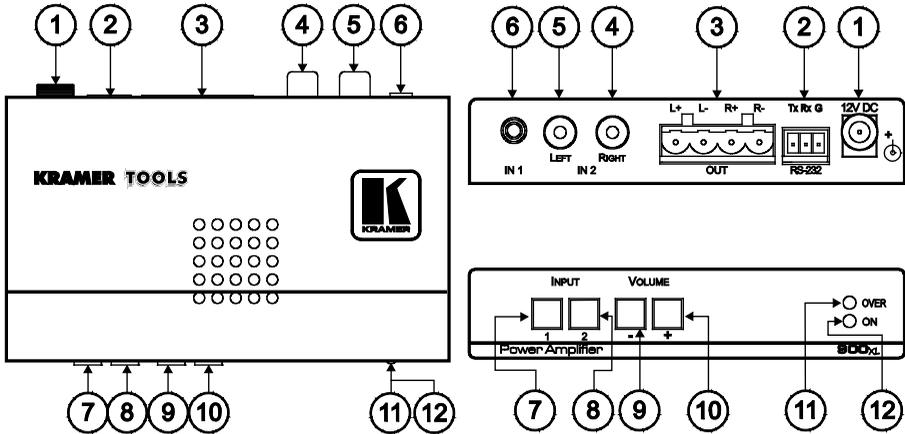


Figure 1: 900xl Power Amplifier – Top, Front, and Rear Views

Table 1: 900xl Power Amplifier Front, and Rear Functions

#	Feature	Function
1	12V DC Connector	+12V DC for powering the unit
2	RS-232 Tx Rx G Terminal Block Connector	Connect to PC
3	L+ L- R+ R- OUT Terminal Block Connector	Speaker output
4	IN 2 RIGHT RCA Connector	Connect to stereo audio right input of source 2
5	IN 2 LEFT RCA Connector	Connect to stereo audio left input of source 2
6	IN 1 3.5mm Mini-jack Connector	Connect to stereo audio input of source 1
7	INPUT 1 Button	Selects the input from audio source 1
8	INPUT 2 Button	Selects the input from audio source 2
9	VOLUME - Button	Decreases output volume
10	VOLUME + Button	Increases output volume
11	OVER LED	Illuminates red when device is overheating and mutes output
12	ON LED	Illuminates green when receiving power

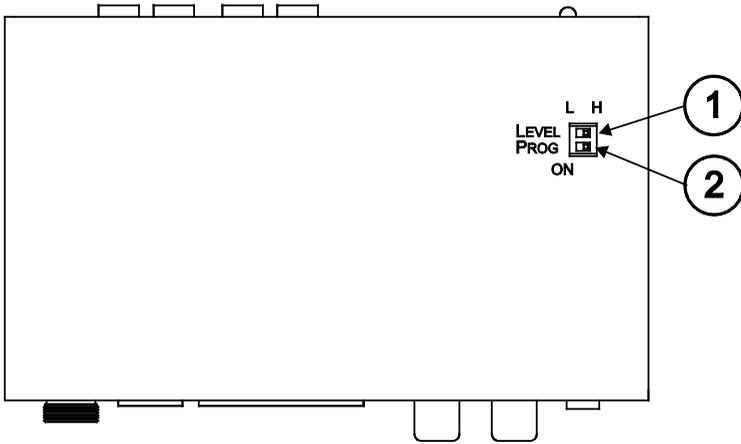


Figure 2: 900xl Power Amplifier – Underside View

Table 2: 900xl Power Amplifier Underside Functions

#	Feature	Function
1	LEVEL L/H Switch	Input level – low / high gain; set to low in case of distortion
2	PROG ON Switch	For use when upgrading device firmware

## 5 Connecting the 900xl Power Amplifier

To connect the **900xl**, as illustrated in [Figure 3](#), perform the following:

1. Connect an unbalanced stereo audio source (for example, a computer audio line out) to the IN 1 mini jack connector.
2. Connect an unbalanced stereo audio source (for example, an unbalanced stereo audio player) to the LEFT and RIGHT IN 2 RCA connectors.
3. Connect the SPKR OUT terminal block to a pair of loudspeakers: Connect the “L+” and the “L-” terminal block connectors to the left loudspeaker, and the “R+” and the “R-” terminal block connectors to the right loudspeaker. **Do not ground the loudspeakers.**
4. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in [Figure 3](#)).

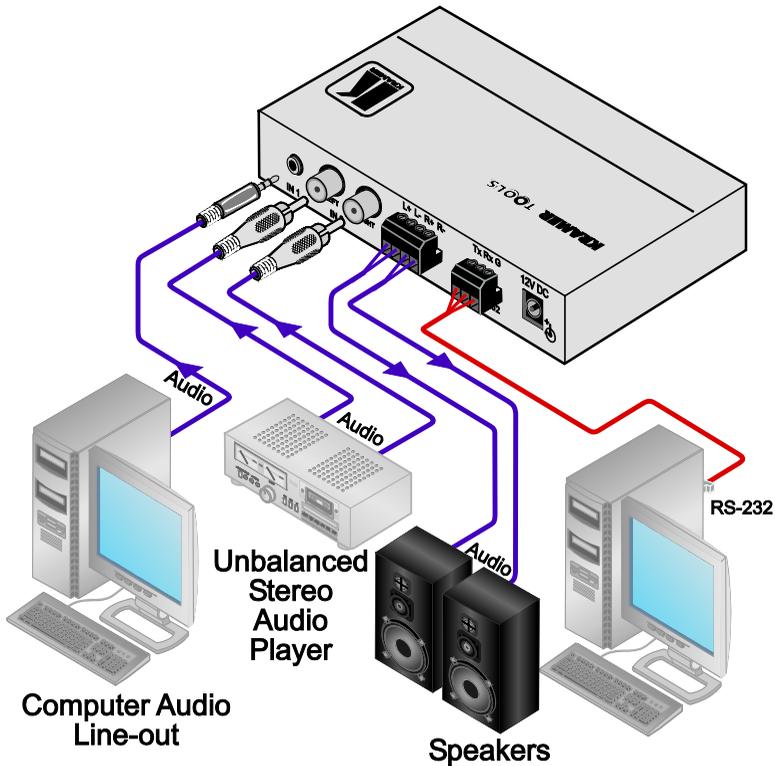


Figure 3: Connecting the 900xl Power Amplifier

## 5.1 Connecting a PC

You can control the **900xl** with a PC (or other controllers) via the RS-232 port using serial commands.

To connect a PC to the **900xl**:

- Connect the RS-232 9-pin D-sub port on your PC to the RS-232 rear panel port on the Master **900xl** using a cable as shown in [Figure 4](#):

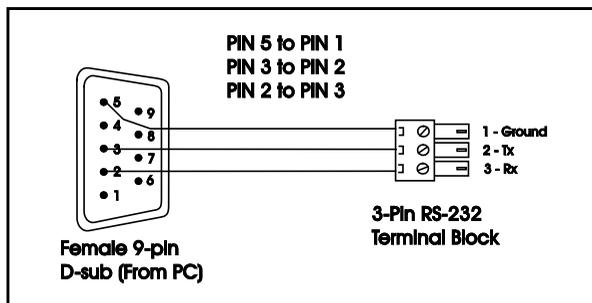


Figure 4: RS-232 Control Cable

## 6 Operating the 900xl Power Amplifier

You can operate your **900xl** using:

- The front panel buttons
- RS-232 serial commands transmitted by a PC, touch screen system, or other serial controller

### 6.1 Using the Front Panel Buttons

To operate the **900xl** using the front panel buttons:

- To choose audio input source 1 (the PC line-out as shown in [Figure 3](#)), press INPUT 1 button.
- To choose audio input source 2 (a stereo tape), press INPUT 2 button.

Adjust the output volume to the speakers using the VOLUME + and – buttons.

**Note:** In the case of output distortion that cannot be corrected using the volume controls, try switching the LEVEL switch on the underside of the unit (see [Figure 2](#)) from H to L and alter the output using the volume control.

## 6.2 Using Serial Commands

To operate your device using serial commands, you need to install Kramer's control software<sup>1</sup>.

For an explanation of all control commands, see sections [8](#) and [9](#).

## 7 Technical Specifications

900xl technical specifications are shown in [Table 3](#):

*Table 3: 900xl Technical Specifications<sup>2</sup>*

INPUTS:	1 unbalanced stereo audio on a 3.5mm mini-jack connector; 1 unbalanced stereo audio on RCA connectors
OUTPUT:	1 stereo differential speaker output
OUTPUT POWER:	2x10W (4Ω)
INPUT SENSITIVITY:	460mV
OUTPUT MUSIC POWER:	2x40W (4Ω)
BANDWIDTH (-3dB):	25kHz
S/N RATIO:	85dB @1kHz, 0dBu output
CONTROLS:	Gain range: -14 to +32dB at high-gain; -21 to +20dB at low-gain
COUPLING:	Input: AC; output: DC
AUDIO THD + NOISE:	0.6% @0dBu output
AUDIO 2nd HARMONIC:	0.35% @0dBu output
POWER SOURCE:	12V DC, 2.0A
DIMENSIONS:	12cm x 7.5cm x 2.5cm (4.7" x 3.0" x 1.0") W, D, H
WEIGHT:	0.2kg (0.4lbs) approx.
ACCESSORIES:	Power supply
OPTIONS:	RK-3T 19" rack adapter

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<sup>1</sup> Download control software from our Web site at <http://www.kramerelectronics.com>

<sup>2</sup> Specifications are subject to change without notice

## 8 Hex Table

[Table 4](#) lists the Hex values (described in section [9](#)) for the **900xl**:

*Table 4: 900xl Hex Table*

Instruction #	Hex Code		Description
2. Switch Audio	02 81 81 81		Connect Input 1 to output
	02 82 81 81		Connect Input 2 to output
22. Gain Control	<b>Input 1</b>	<b>Input 2</b>	
	16 81 80 81	16 82 80 81	Mute
	16 81 81 81	16 82 81 81	
	16 81 82 81	16 82 82 81	...
	...	...	
	16 81 FF 81	16 82 FF 81	Maximum gain
24. Increase/Decrease Audio Parameter	18 81 80 81		Increase output
	18 81 81 81		Decrease output

## 9 Kramer Protocol 2000

The **900xl** is compatible with Kramer's Protocol 2000, version 0.50. This RS-232/RS-485 communication protocol uses four bytes of information as defined below. For RS-232, a null-modem connection between the machine and controller is used. The default data rate is 9600 baud, with no parity, 8 data bits, and 1 stop bit.

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

*Table 5: Protocol Definitions*

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



NOTES on the above table:

**NOTE 1** – When the master switcher is reset, (e.g. when it is turned on), the reset code is sent to the PC. If this code is sent to the switchers, it will reset according to the present power-down settings.

**NOTE 2** – These are bi-directional definitions. That is, if the switcher receives the code, it will perform the instruction; and if the instruction is performed (due to a keystroke operation on the front panel), then these codes are sent. For example, if the HEX code

02            82            81            81

was sent from the PC, then the switcher (machine 3) will switch input 1 to output 1. If the user switched input 1 to output 1 via the front panel keypad, then the switcher will send HEX codes:

42            81            81            81

to the PC.

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

**NOTE 3** – SETUP # 0 is the present setting. SETUP # 1 and higher are the settings saved in the switcher's memory, (i.e. those used for Store and Recall).

**NOTE 4** – The reply to a "REQUEST" instruction is as follows: the same instruction and INPUT codes as were sent are returned, and the OUTPUT is assigned the value of the requested parameter.

**NOTE 6** – If INPUT is set to 127 for these instructions, then, if the function is defined on this machine, it replies with OUTPUT=1. If the function is not defined, then the machine replies with OUTPUT=0, or with an error (invalid instruction code).

If the INPUT is set to 126 for these instructions, then, if possible, the machine will return the current setting of this function, even for the case that the function is not defined.

**NOTE 11** – For machines where the audio parameter is programmable.

**NOTE 12** – Under normal conditions, the machine's present status is saved each time a change is made. The "power-down" save (auto-save) may be disabled using this code. Note that whenever the machine is turned on, the auto-save function is set.

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

If the request for identification is sent with the INPUT set as 3 or 4, the appropriate machine will send its software version number. Again, the reply would be the decimal value of the INPUT and OUTPUT - the INPUT representing the number in front of the decimal point, and the OUTPUT representing the number after it. For example, for version 3.5, the reply to the request to send the version number would be (HEX codes):

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

**NOTE 14** – The number of inputs and outputs refers to the specific machine which is being addressed, not to the system. For example, if six 16X16 matrices are configured to make a 48X32 system (48 inputs, 32 outputs), the reply to the HEX code

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

would be HEX codes

7E            82            90            82 i.e. 16 outputs

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## LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

### HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven years from the date of the first customer purchase.

### WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

### WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site [www.kramerelectronics.com](http://www.kramerelectronics.com).
2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
3. Damage, deterioration or malfunction resulting from:
  - i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
  - ii) Product modification, or failure to follow instructions supplied with the product
  - iii) Repair or attempted repair by anyone not authorized by Kramer
  - iv) Any shipment of the product (claims must be presented to the carrier)
  - v) Removal or installation of the product
  - vi) Any other cause, which does not relate to a product defect
  - vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

### WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

### HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

### LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

### EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

**NOTE:** All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

- EN-50081: "Electromagnetic compatibility (EMC);  
generic emission standard.  
Part 1: Residential, commercial and light industry"
- EN-50082: "Electromagnetic compatibility (EMC) generic immunity standard.  
Part 1: Residential, commercial and light industry environment".
- CFR-47: FCC\* Rules and Regulations:  
Part 15: "Radio frequency devices  
Subpart B Unintentional radiators"

### CAUTION!

⊗ Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.

⊗ Use the supplied DC power supply to feed power to the machine.

⊗ Please use recommended interconnection cables to connect the machine to other components.

\* FCC and CE approved using STP cable (for twisted pair products)



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**For the latest information on our products and a list of Kramer distributors, visit our Web site: [www.kramerelectronics.com](http://www.kramerelectronics.com) where updates to this user manual may be found. We welcome your questions, comments and feedback.**



**Caution**

**Safety Warning:**

Disconnect the unit from the power supply before opening/servicing.



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**Kramer Electronics, Ltd.**

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