

**Kramer Electronics, Ltd.**



# **USER MANUAL**

**Model:**

**TP-50**

*XGA / Audio Line Receiver – DA*

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## 1 Introduction

Welcome to Kramer Electronics (since 1981): a world of unique, creative and affordable solutions to the infinite range of problems that confront the video, audio and presentation professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 500-plus different models now appear in 8 Groups<sup>1</sup>, which are clearly defined by function.

Congratulations on purchasing your Kramer TOOLS **TP-50 XGA / Audio Line Receiver – DA**, which is ideal for:

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

The package includes the following items:

- **TP-50**
- Power adapter (12V DC Input) and 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>

### 2.1 Quick Start

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

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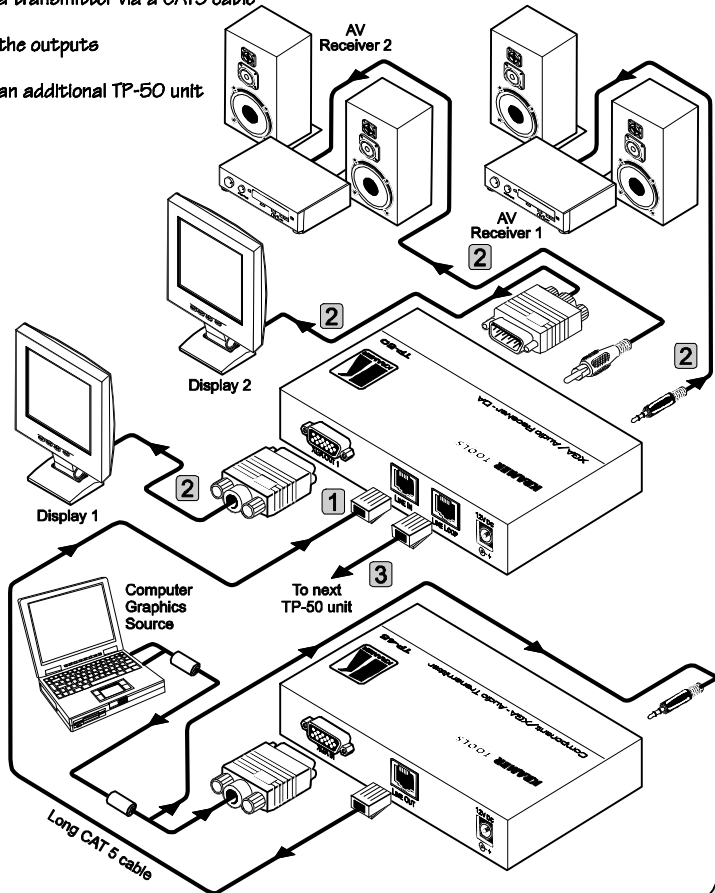
1 GROUP 1: Distribution Amplifiers; GROUP 2: Video and Audio Switchers, Matrix Switchers and Controllers; GROUP 3: Video, Audio, VGA/XGA Processors; GROUP 4: Interfaces and Sync Processors; GROUP 5: Twisted Pair Interfaces; GROUP 6: Accessories and Rack Adapters; GROUP 7: Scan Converters and Scalers; and GROUP 8: Cables and Connectors

2 Download up-to-date Kramer user manuals from the Internet at this URL: <http://www.kramerelectronics.com>

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

**Step 1: Connect the input and the outputs - see section 5**

- 1 Connect a transmitter via a CAT5 cable
- 2 Connect the outputs
- 3 Connect an additional TP-50 unit



**Step 2: Set the underside switches - see section 5**

Set the Hs and Vs  
polarity switches

Hs Vs  
INVERTED  
NORMAL

LEVEL  
EQ.

Adjust the XGA  
level

Adjust the XGA  
EQ. level

**Step 3: Connect the power**

### 3 Overview

This section describes:

- A summary of the **TP-50**, see section 3.1
- Using shielded twisted pair (STP)/unshielded twisted pair (UTP), see section 3.2
- The power connect feature, see section 3.3
- Recommendations for achieving the best performance, see section 3.4

#### 3.1 About the TP-50

The **TP-50 XGA / Audio Line Receiver – DA** receives a CAT5 signal from a transmitter<sup>1</sup>, decodes it and simultaneously distributes it to two XGA outputs as well as to two analog and to two digital audio outputs. Additional **TP-50** units can be connected via the **TP-50** LINE LOOP CAT5 connector, to connect additional outputs as well as to extend the range of the output signals<sup>2</sup>.

In particular, the **TP-50 XGA / Audio Line Receiver – DA**:

- Has two XGA outputs on HD15F connectors
- Includes two digital audio outputs (S/PDIF) on RCA connectors and two stereo analog outputs on 3.5mm mini jacks
- Can power or be powered by the transmitter over the same CAT5 cable (see section 3.3)
- Can change the polarity of decoding H and V Sync for video (XGA)
- Includes EQ. and LEVEL controls for the video (XGA)
- Features a CAT5 output for transmitting the signal to an additional receiver
- Is 12VDC fed

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

The decision whether to use shielded twisted pair (STP) cable or unshielded twisted pair (UTP) cable depends on the nature of the application.

It is recommended that in applications with high interference, shielded twisted pair (STP) cable will give better results. However, the shield itself does create a capacitance that degrades the frequency response of the machines. For shorter distances, of 50m or so, shielded twisted pair (STP) cable is preferred because it provides protection from interference (degradation is non apparent).

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<sup>1</sup> For example, the Kramer TP-45

<sup>2</sup> You can connect up to three additional TP-50 units, adding a total cable length of up to 300 meters. The video quality may be reduced if further units are connected. Adjust controls on the first unit, then on the second unit and then on the third TP-50 unit to avoid over-saturation and image loss in the chain

For a long range application, unshielded twisted pair (UTP) cable is preferred. However, the unshielded twisted pair (UTP) cable should be installed far away from electric cables, motors etc., which are prone to create electrical interference.

### 3.3 About the Power Connect Feature

The Power Connect feature lets you power a transmitter / receiver system by connecting just one power adapter—to either the transmitter or the receiver. The other unit is fed via the cable connecting between the transmitter/receiver. The Power Connect feature applies as long as the cable can carry power. The distance does not exceed 50 meters on standard CAT5 cable, for longer distances, heavy gauge cable should be used<sup>1</sup>.

For a CAT5 cable exceeding a distance of 50 meters, separate power supplies should be connected to the transmitter and to the receiver simultaneously.

### 3.4 Recommendations for Achieving the Best Performance

To achieve the best performance:

- Connect only good quality connection cables, thus avoiding 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 and position your **TP-50** away from moisture, excessive sunlight and dust



**Caution** – No operator-serviceable parts inside unit.

**Warning** – Use only the Kramer Electronics input power wall adapter that is provided with this unit<sup>2</sup>.

**Warning** – Disconnect power and unplug unit from wall before installing or removing device or servicing unit.

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<sup>1</sup> CAT5 cable is still suitable for the video/audio transmission, but not for feeding the power at these distances

<sup>2</sup> For example: model number AD2512C, part number 2535-000251

## 4 Your TP-50 XGA / Audio Line Receiver – DA

For a description of the **TP-50 XGA / Audio Line Receiver – DA**:

- Topside, see section 4.1
- Underside, see section 4.2

### 4.1 Your TP-50 XGA / Audio Line Receiver – DA Topside

Figure 1 and Table 1 define the **TP-50** topside:

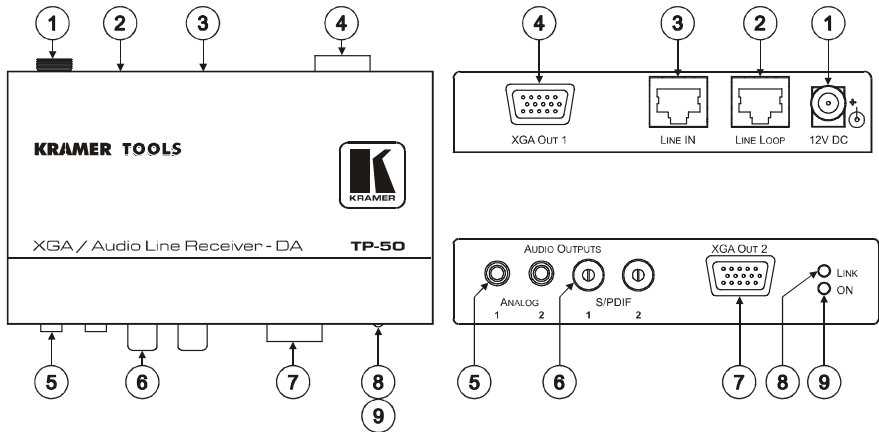


Figure 1: TP-50 XGA / Audio Line Receiver – DA

Table 1: TP-50 XGA / Audio Line Receiver – DA Features

#	Feature		Function
1	12V DC		+12V DC connector for powering the unit
2	LINE LOOP RJ-45 Connector		Connect to the LINE IN RJ-45 connector of an additional receiver to increase the number of outputs
3	LINE IN RJ-45 Connector		Connect to the LINE OUT connector of a transmitter <sup>1</sup>
4	XGA OUT 1 HD15F Connector		Connect to the video acceptor 1
5	AUDIO OUTPUTS	ANALOG 3.5mm Mini Jacks	Connect to the stereo analog audio acceptors (1 and 2)
6		S/PDIF RCA Connectors	Connect to the digital audio acceptor (1 and 2)
7	XGA OUT 2 HD15F Connector		Connect to the video acceptor 2
8	LINK LED		Lights when receiving a valid input signal
9	ON LED		Lights when receiving power

<sup>1</sup> Using a straight pin to pin UTP or STP cable with RJ-45 connectors at both ends (the PINOUT is defined in Table 3 and Figure 4)

## 4.2 Your TP-50 XGA / Audio Line Receiver – DA Underside

Figure 2 and Table 2 define the underside of the **TP-50**:

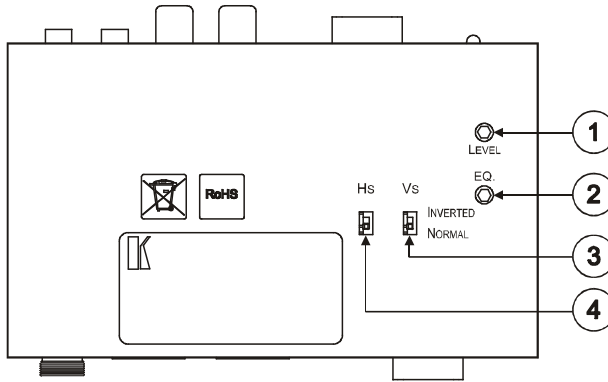


Figure 2: TP-50 XGA / Audio Line Receiver – DA Underside

Table 2: TP-50 XGA / Audio Line Receiver – DA Underside Features

#	Feature	Function
1	LEVEL Trimmer	Adjusts <sup>1</sup> the output signal level for the XGA outputs
2	EQ. <sup>2</sup> Trimmer	Adjusts <sup>1</sup> the cable compensation (equalization) level for the XGA outputs
3	VS Switch <sup>3</sup>	Slide the switch down (to NORMAL) to retain the polarity Slide the switch up (to INVERTED) to invert the VS polarity
4	HS Switch <sup>3</sup>	Slide the switch down (to NORMAL) to retain the polarity Slide the switch up (to INVERTED) to invert the HS polarity

<sup>1</sup> Use a screwdriver to carefully rotate the trimmer, adjusting the appropriate level

<sup>2</sup> Degradation and VGA/XGA signal loss can result from using long cables (due to the effects of stray capacitance, for example), sometimes leading to a loss of sharpness in high-resolution signals

<sup>3</sup> By default, both switches are set to NORMAL



## 5 Connecting the TP-50 XGA / Audio Line Receiver – DA

You can use the **TP-50** with an XGA / audio transmitter, for example, the Kramer **TP-121** or **TP-45** transmitter<sup>1</sup>, and also connect an additional **TP-50** unit to increase the number of outputs.

To configure a **TP-45 / TP-50** XGA / Audio Line Receiver – DA system<sup>2</sup> as illustrated in the example in Figure 3, do the following:

1. On the **TP-45**:
  - Connect an XGA source to the XGA IN HD15F connector
  - Connect an analog audio source to the ANALOG AUDIO 3.5mm mini jack<sup>3</sup>
  - If necessary, set the HS and VS switches on the **TP-45** underside
  - Press the video SELECT button to choose XGA
  - Release the audio SELECT button to choose ANALOG AUDIO<sup>4</sup>
2. On the **TP-50**, connect the following:
  - The XGA OUT 1 HD15F connector to an XGA acceptor (for example, display 1) and the ANALOG 1 AUDIO OUTPUT 3.5mm mini jack<sup>5</sup> to an analog audio acceptor (for example, AV receiver 1)
  - The XGA OUT 2 HD15F connector to an XGA acceptor (for example, display 2) and the S/PDIF 2 AUDIO OUTPUT RCA connector to an S/PDIF acceptor (for example, AV receiver 2)
3. Connect the LINE OUTPUT RJ-45 connector on the **TP-45** to the LINE IN RJ-45 connector on the **TP-50**, via CAT5 cabling, see section 5.1.
4. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity on both<sup>6</sup> the **TP-45** and the **TP-50** (not shown in Figure 3).

The signal from the XGA source is transmitted via CAT5 cable, decoded and converted at the XGA OUT HD15F connector to the XGA acceptor.
5. If required, connect the LINE LOOP RJ-45 connector on the **TP-50** to an additional **TP-50** unit<sup>7</sup>.

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1 Refer to the separate user manuals for these machines, which can be downloaded from the Internet at this URL:  
<http://www.kramerelectronics.com>

2 Using up to 300ft (100m) of UTP cabling

3 Or you can connect a digital audio source to the S/PDIF RCA connector

4 If the digital audio input is connected, press the button to select S/PDIF

5 Alternatively, you can connect a digital audio acceptor to the S/PDIF RCA connector, or you can connect both

6 You can connect the power to the TP-50 to power both the TP-45 and TP-50

7 Alternatively, you can connect it to an additional TP-46 unit

6. On the **TP-50** underside:

- Adjust<sup>1</sup> the video output signal level and/or cable compensation equalization level, if required
- If necessary, set the HS and VS switches<sup>2</sup>, on the underside

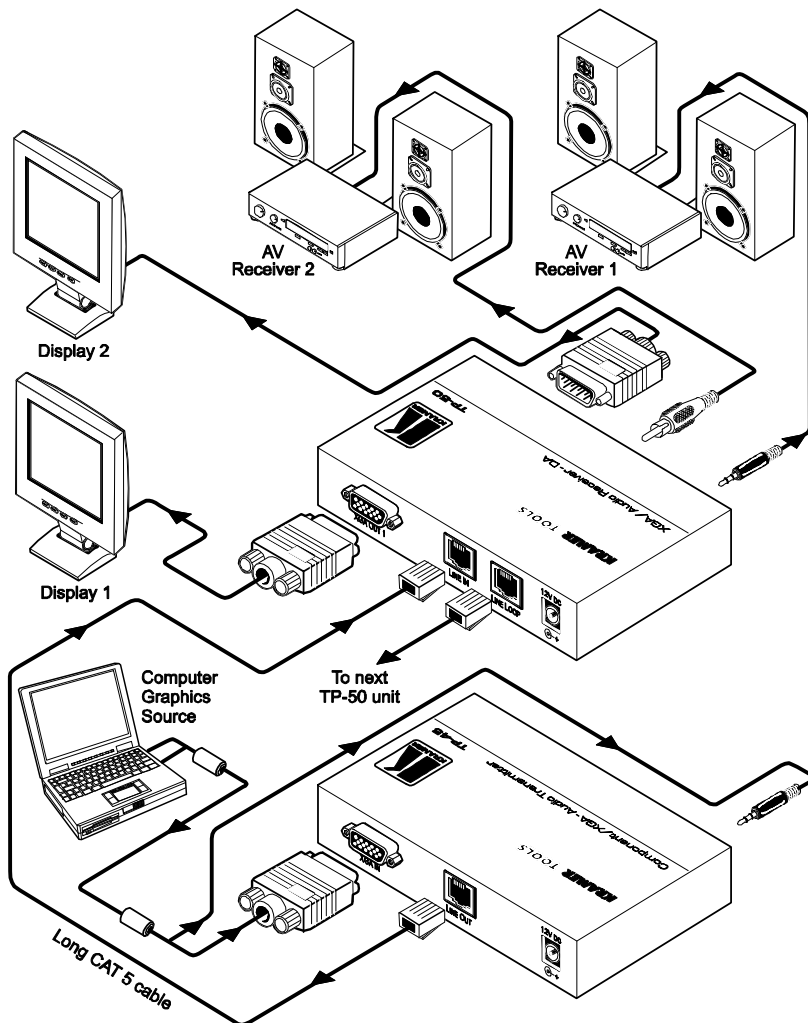


Figure 3: Component/XGA – Audio Distribution System, XGA Mode

1 Use a screwdriver to carefully rotate the trimmer, adjusting the appropriate level

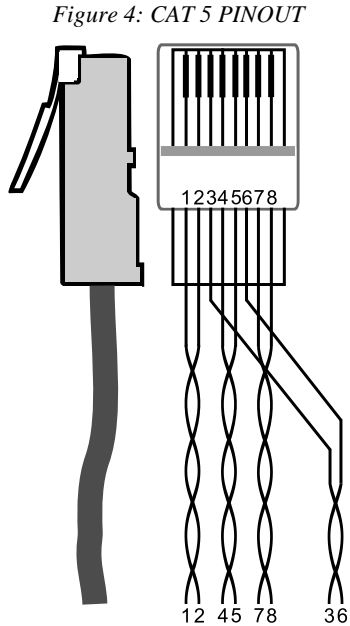
2 By default, both switches are set down (for normal V SYNC and H SYNC polarity)

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

Table 3 and Figure 4 define the CAT 5 PINOUT, using a straight pin to pin cable with RJ-45 connectors:

Table 3: CAT 5 PINOUT

EIA /TIA 568A		EIA /TIA 568B	
PIN	Wire Color	PIN	Wire Color
1	Green / White	1	Orange / White
2	Green	2	Orange
3	Orange / White	3	Green / White
4	Blue	4	Blue
5	Blue / White	5	Blue / White
6	Orange	6	Green
7	Brown / White	7	Brown / White
8	Brown	8	Brown
Pair 1		Pair 1	4 and 5
Pair 2		Pair 2	3 and 6
Pair 3		Pair 3	1 and 2
Pair 4		Pair 3	3 and 6
		Pair 4	7 and 8



## 6 Technical Specifications

Table 4 defines the technical specifications:

*Table 4: Technical Specifications<sup>1</sup> of the TP-50*

INPUTS:	1 CAT5 on an RJ-45 connector, for differential XGA and S/PDIF audio (line input)	
OUTPUTS:	2 XGA outputs on HD15F connectors 1 LINE LOOP on an RJ-45 connector 2 stereo unbalanced audio outputs on 3.5mm phone jacks 2 S/PDIF outputs on RCA connectors	
MAX. OUTPUT LEVEL:	VIDEO: 2Vpp @max gain	AUDIO: 4.6Vpp (analog)
VIDEO RESOLUTION:	Up to UXGA	
AUDIO BANDWIDTH:	22kHz	
DIFF. GAIN:	4.7%	
DIFF. PHASE:	0.3 Deg.	
K-FACTOR:	<0.05%	
S/N RATIO:	VIDEO: 62.5dB	AUDIO: 69.2dB
CONTROLS:	Video level: -9.5dB to +2.2dB; video EQ: 0 to +26.3dB @50MHz	
COUPLING:	VIDEO: DC	AUDIO: Input: AC Output: Analog: DC; S/PDIF: AC
AUDIO THD + NOISE:	0.035% @1kHz	
AUDIO 2nd HARMONIC:	0.003% @1kHz	
POWER SOURCE:	12V DC, 800mA	
DIMENSIONS:	12.1cm x 7.18cm x 2.42cm (4.76" x 2.83" x 0.95"), W, D, H	
WEIGHT:	0.3kg (0.67lbs.) approx.	
ACCESSORIES:	Power supply	
OPTIONS:	19" rack adapters	

<sup>1</sup> Specifications are subject to change without notice

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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.
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 your 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);<br>generic emission standard.<br>Part 1: Residential, commercial and light industry"          |
| EN-50082: | "Electromagnetic compatibility (EMC) generic immunity standard.<br>Part 1: Residential, commercial and light industry environment". |
| CFR-47:   | FCC Rules and Regulations:<br>Part 15: "Radio frequency devices<br>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.



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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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