

**Kramer Electronics, Ltd.**



# **USER MANUAL**

**Model:**

**VP-12NHD**

*1:12 + 3 UXGA / CAT5 Distributor*

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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 **VP-12NHD 1:12 + 3 UXGA / CAT5 Distributor**, which is ideal for:

- Presentation and multimedia applications that require high quality computer graphics distribution to multiple monitors and/or projectors
- Long range graphics distribution for schools, hospitals, security, and stores

The package includes the following items:

- **VP-12NHD 1:12 + 3 UXGA / CAT5 Distributor**
- Power cord
- 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:

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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>

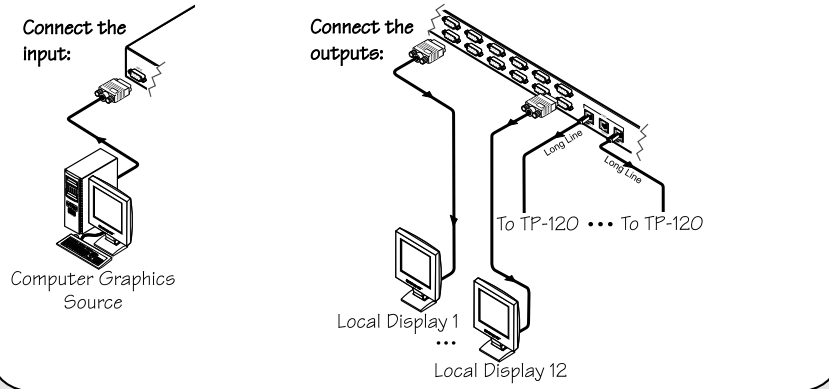
3 The complete list of Kramer cables is on our Web site at <http://www.kramerelectronics.com>

**Step 1: Mount the machine - see section 5**

Mount the machine in a rack or stick the 4 rubber feet to the underside



**Step 2: Connect the VP-12NHD - see section 6**



**Step 3: Turn the power ON**

**Step 4: Set / adjust the underside switches / controls - see section 4**

Set the ID Bit:  OFF  ON

Adjust the red, green and blue level controls, if required, using a screwdriver:

LEVEL	Control
BLUE	<input type="radio"/>
GREEN	<input type="radio"/>
RED	<input type="radio"/>

Set the polarity:  INVERT  NORMAL

VS HS

### 3 Overview

This section describes:

- The power connect feature, see section 3.1
- Using shielded twisted pair (STP) / unshielded twisted pair (UTP), see section 3.2
- A summary of the **VP-12NHD**, see section 3.3
- Recommendations for achieving the best performance, see section 3.4

#### 3.1 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.

#### 3.2 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 is used. 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 not apparent).

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

#### 3.3 About the VP-12NHD

The Kramer **VP-12NHD** is a high performance distributor for computer graphics signals, accepting one input, providing necessary buffering and isolation, and distributing the signal to its identical 12 outputs, as well as transmitting it over UTP cabling to 3 CAT5 outputs, each with a transmission range of more than 300 ft. (more than 100 meters).

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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

In particular, the **VP-12NHD** has:

- Switches on the underside for ID Bit control and polarity control<sup>1</sup>
- Three level control trimmers on the underside for red, green, and blue
- A video bandwidth that exceeds 300MHz, ensuring that it remains transparent even at high-resolution UXGA modes
- The power connect feature, see section 3.1

In addition, the **VP-12NHD** is mains fed and housed in a 19" enclosure.

### 3.4 Recommendations for Achieving the Best Performance

Achieving the best performance means:

- Connecting 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)
- Avoiding interference from neighboring electrical appliances that may adversely influence signal quality, and positioning your **VP-12NHD** away from moisture, excessive sunlight and dust

## 4 Your VP-12NHD 1:12 + 3 UXGA / CAT5 Distributor

This section defines the **VP-12NHD 1:12 + 3 UXGA / CAT5 Distributor**:

- Front and rear panels (see Figure 1 and Table 1)
- Underside panel (see Figure 2 and Table 2)

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<sup>1</sup> Letting you change the polarity of the H and V Sync outputs

Your VP-12NHD 1:12 + 3 UXGA / CAT5 Distributor

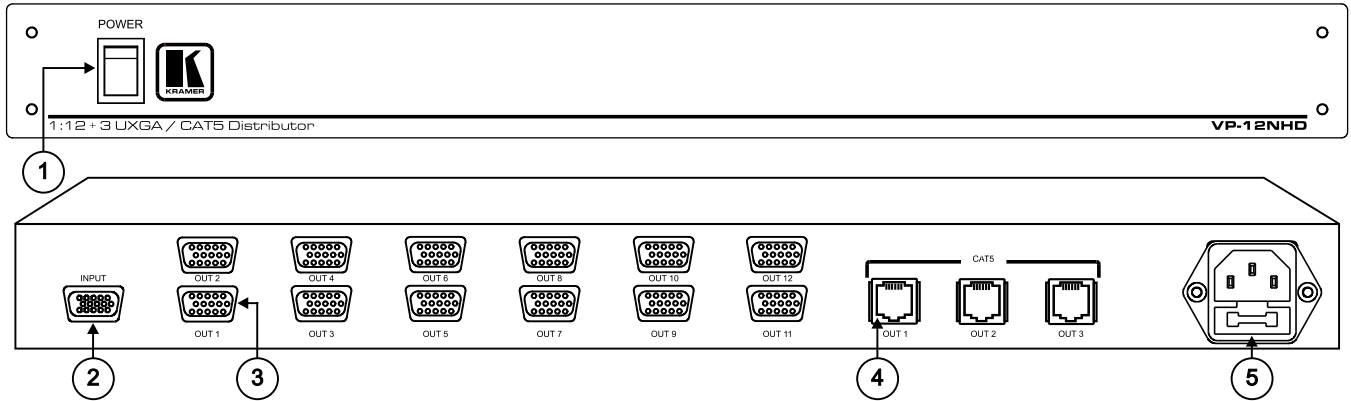


Figure 1: VP-12NHD 1:12 + 3 UXGA / CAT5 Distributor

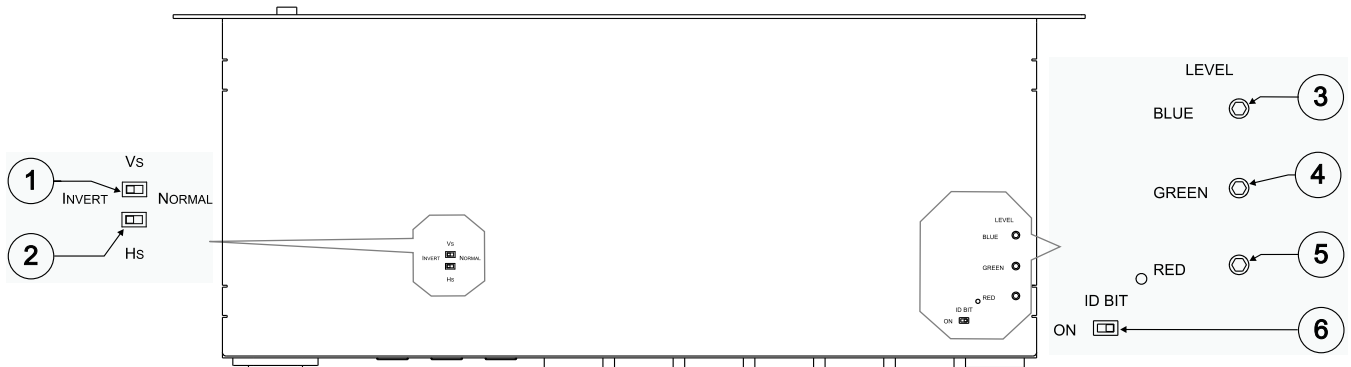


Figure 2: Underside of the VP-12NHD 1:12 + 3 UXGA / CAT5 Distributor



Table 1: Front and Rear Panel Features of the VP-12NHD

#	Feature	Function
1	POWER Switch	Illuminated switch for turning the unit ON or OFF
2	INPUT HD15F Connector	Connect to the computer graphics (UXGA) source
3	OUT HD15F Connectors	Connect to the computer graphics (UXGA) acceptors (from 1 to 12)
4	OUT RJ-45 Connectors	Connect to <sup>1</sup> the LINE IN RJ-45 connector <sup>2</sup> (from 1 to 3)
5	Power Connector with FUSE	AC connector enabling power supply to the unit

Table 2: Underside Features of the VP-12NHD

#	Feature	Function
1	VS Switch	Slide the switch to the left <sup>3</sup> to invert the VS polarity <sup>4</sup> ; slide the switch to the right, to NORMAL, to retain the polarity
2	HS Switch	Slide the switch to the left <sup>3</sup> to invert the HS polarity <sup>4</sup> ; slide the switch to the right, to NORMAL, to retain the polarity
3	LEVEL	BLUE Trimmer Adjusts the blue level <sup>5</sup>
4		GREEN Trimmer Adjusts the green level <sup>5</sup>
5		RED Trimmer Adjusts the red level <sup>5</sup>
6	ID BIT CONTROL Switch	Slide to the left to set to ON <sup>6</sup> ; to the right to set to OFF

1 Using a UTP cable with CAT5 connectors at both ends (the PINOUT is defined in Table 3 and Figure 4)

2 For example, on the TP-120 XGA Line Receiver. Refer to the separate user manual: PT-110, WP-110, PT-120, TP-120, which can be downloaded from the Internet at this URL: <http://www.kramerelectronics.com>

3 By default, both switches are set to the right

4 Downgoing syncs

5 Insert a screwdriver into the small hole and carefully rotate it to adjust the level

6 The default. Enabling the notebook or laptop to output a VGA signal to an external VGA monitor



## 5 Installing on a Rack

This section describes what to do before installing on a rack and how to rack mount.

### Before Installing on a Rack

Before installing on a rack, be sure that the environment is within the recommended range:	
Operating temperature range	+5 to +45 Deg. Centigrade
Operating humidity range	5 to 65 % RHL, non-condensing
Storage temperature range	-20 to +70 Deg. Centigrade
Storage humidity range	5 to 95% RHL, non-condensing



### CAUTION!!

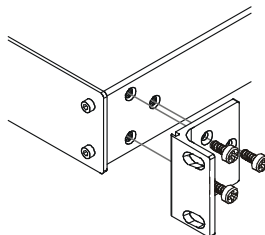
When installing on a 19" rack, avoid hazards by taking care that:

- 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 supply connections other than direct connections to the branch circuit (for example, the use of power strips), and that you use only the power cord that is supplied with the machine.

### How to Rack Mount

To rack-mount the 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 that:

- 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 (you can download it at: <http://www.kramerelectronics.com>)

## 6 Using Your VP-12NHD 1:12 + 3 UXGA / CAT5 Distributor

This section describes how to connect the **VP-12NHD 1:12 + 3 UXGA / CAT5 Distributor**. The example in Figure 3 illustrates how to output a computer graphics signal from a computer to up to 12 local monitors, as well as how to transmit it over UTP cabling to 3 **TP-120 XGA Line Receiver** units.

To connect the **VP-12NHD** and up to 3 **TP-120 XGA Line Receiver** units, do the following:

1. Connect a computer graphics source (for example, a computer) to the INPUT HD15F connector.
2. Connect the OUTPUT HD15F connectors to up to 12 acceptors (for example, Local Display 1 to Local Display 12).
3. Ensure that the ID BIT switch on the underside of the **VP-12NHD** is set to ON (by sliding it to the left). This would enable a notebook or laptop (if connected instead of a computer) to output a VGA signal to an external VGA monitor.
4. On the **VP-12NHD**, connect<sup>1</sup> the CAT5 RJ-45<sup>2</sup>:
  - OUT 1 connector to the LINE IN RJ-45 connector on a **TP-120** unit, and connect the XGA OUT connector on that **TP-120** unit to Display 1
  - OUT 2 connector to the LINE IN RJ-45 connector on a second **TP-120** unit, and connect the XGA OUT connector on that second **TP-120** unit to Display 2
  - OUT 3 connector to the LINE IN RJ-45 connector on a third **TP-120** unit, and connect the XGA OUT connector on that third **TP-120** unit to Display 3
5. Connect the power cord<sup>3</sup> (not illustrated in Figure 3).
6. On the **TP-120** units, if necessary:
  - Set the H SYNC and V SYNC switches<sup>4</sup> on the underside
  - Adjust<sup>5</sup> the video output signal level and/or cable compensation equalization level
7. On the **VP-12NHD**, if required:
  - Adjust<sup>5</sup> the blue, green and red signal levels
  - Set the VS and HS switches<sup>6</sup>

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1 Via UTP cabling, with a range of more than 300ft (>100m): see section 6.1

2 The TP-120 units may be powered via this connector (instead of via the 12VDC external supply)

3 We recommend that you use only the power cord that is supplied with this machine

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

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

6 By default, both switches are set to the right (to NORMAL) to retain the VS and HS polarity

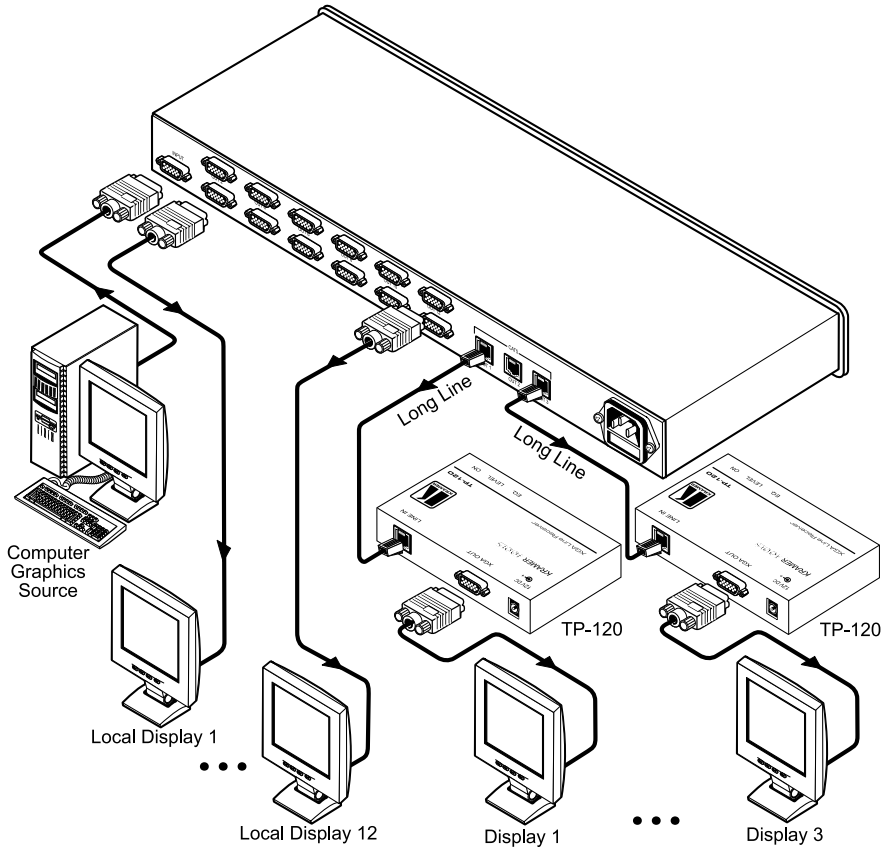


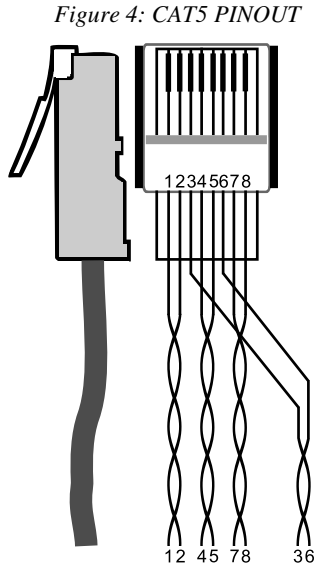
Figure 3: Connecting the VP-12NHD 1:12 + 3 UXGA / CAT5 Distributor

## 6.1 Wiring the CAT5 LINE IN / LINE OUT RJ-45 Connectors

Table 3 and Figure 4 define the UTP CAT5 PINOUT, using a straight pin to pin cable with RJ-45 connectors:

Table 3: CAT5 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		4 and 5	
Pair 2		3 and 6	
Pair 3		1 and 2	
Pair 4		7 and 8	



## 7 Technical Specifications

Table 4 includes the technical specifications:

*Table 4: Technical Specifications<sup>1</sup> of the VP-12NHD 1:12 + 3 UXGA / CAT5 Distributor<sup>2</sup>*

INPUT:	1 UXGA on an HD15F connector
OUTPUTS:	12 UXGA on HD15F connectors 3 RJ-45 OUT connectors
MAX. OUTPUT LEVEL <sup>3</sup> :	UXGA: 1.8Vpp; CAT5: 1.6Vpp
BANDWIDTH (-3dB) <sup>4</sup> :	UXGA: 340MHz; CAT5: 150MHz
DIFF. GAIN:	0.17%
DIFF. PHASE:	0.44°
K-FACTOR:	<0.05%
S/N RATIO:	73dB
CONTROLS:	Level: -0.8dB to 2.4dB, 2 switches for sync inversion
COUPLING:	UXGA: DC; CAT5: AC
POWER SOURCE:	230 VAC, 50 / 60 Hz (115VAC, U.S.A.) 31VA
DIMENSIONS:	19 inch (W), 7 inch (D) 1U (H) rack mountable
WEIGHT:	2.7 kg. (6 lbs.) approx.
ACCESSORIES:	Power cord

1 Specifications are subject to change without notice

2 Specifications are shown for the UXGA output, unless stated otherwise

3 The CAT5 output is measured at the TP-120 output, at maximum TP-120 gain of the TP-12N and the TP-120 setup

4 The CAT5 output is measured at the TP-120 output on the TP-12N and the TP-120 setup

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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);  
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.



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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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