



KRAMER ELECTRONICS LTD.

USER MANUAL

MODEL:

TP-46N

Component/UXGA/Audio
Receiver

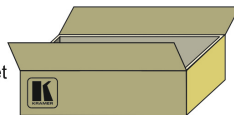
P/N: 2900-300027 Rev 2

TP-46N Quick Start Guide

This page guides you through a basic installation and first-time use of your **TP-46N**. For more detailed information, see the **TP-46N** User Manual. You can download the latest manual at <http://www.kramerelectronics.com>.

Step 1: Check what's in the box

- ☒ **TP-46N** Component/UXGA/Audio Receiver
- ☒ 1 Quick Start sheet
- ☒ 1 Power supply (12V DC)
- ☒ 1 User Manual
- ☒ 4 Rubber feet per device



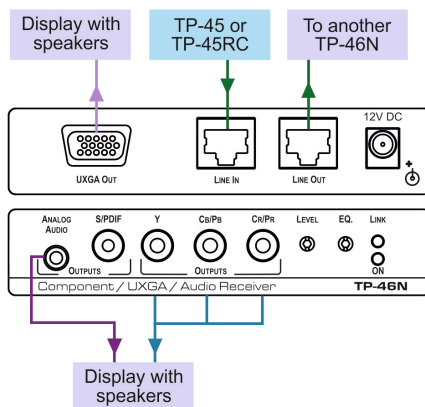
Save the original box and packaging in case your product needs to be returned to the factory for service.

Step 2: Install the TP-46N

Mount the machine in a rack (using the RK-3T rack adapter) or place on a table.

Step 3: Connect the inputs and outputs

Switch off the power on each device before connecting it to your **TP-46N**.



Use Kramer high-performance cables to connect AV equipment to the **TP-46N**.

Step 4: Connect the power

Connect a 12V DC power supply to the transmitter or receiver and plug the supply into the mains electricity.



Step 5: Operate the TP-46N

Adjust the LEVEL and EQ as needed.

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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 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 and GROUP 11: Sierra Products.

Thank you for purchasing the Kramer TOOLS **TP-46N** *Component/UXGA/Audio Receiver*, that uses existing UTP cabling to create an efficient, fast and uncluttered environment for:

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

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).



Caution: There are 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

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)
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer **TP-46N** away from moisture, excessive sunlight and dust

3 Overview

The **TP-46N** is a twisted pair receiver for component video (YUV) or computer graphics video and unbalanced stereo or S/PDIF audio signals. The **TP-45/TP-45RC** transmitters convert audio and video to a twisted pair signal and the **TP-46N** converts the twisted pair signal back into audio and video signals.

By selecting the required video input signal, the **TP-45** or **TP-45RC** with the **TP-46N** can constitute either a component video (Y, CB/PB, CR/PR) or a UXGA video–audio transmitter/receiver system:

The term UXGA used throughout this user manual implies VGA resolutions up to and exceeding UXGA.

The **TP-46N** does not convert the video signal format. Thus computer graphics sources must be routed to computer graphics outputs. Similarly, component video sources must be routed to component video outputs.

- If UXGA is selected, the **TP-45** or **TP-45RC** receives a UXGA (and audio) signal and transmits it over the CAT 5 cable to the UXGA output on the **TP-46N** receiver
- If component video is selected, the component video signal is transmitted over the CAT 5 cable to the COMP outputs on the **TP-46N** receiver
- The analog audio or S/PDIF (digital audio)—as selected via the audio SELECT button—is transmitted together with the video signal over the CAT 5 cable to the **TP-46N** receiver

The audio signal is distributed simultaneously to the analog or digital audio outputs.

Additional **TP-46N** units can be connected via the **TP-46N** LINE OUT CAT 5 connector, to extend the range of the output signals.

You can connect up to three additional **TP-46N** units, adding a total cable length of up to 300 meters. The video quality may be reduced if further units are connected.

The **TP-46N** *Component/UXGA/Audio Receiver* features:

- YUV output on 3 RCA connectors and a computer graphics output on a 15-pin HD (F) connector
- Digital audio output (S/PDIF) on an RCA connector and a stereo analog output on a 3.5mm mini jack

- The Power Connect feature where the **TP-46N** can power the **TP-45** or **TP-45RC** over the same CAT 5 cable (see [Section 3.1](#))
- EQ. and LEVEL controls
- A CAT 5 output for transmitting the signal to an additional receiver
- 12V DC power

3.1 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 (CAT 5 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 CAT 5 cable exceeding a distance of 50m, separate power supplies should be connected to the transmitter and to the receiver simultaneously.

3.2 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.

3.3 Defining the TP-46N

Figure 1 defines the **TP-46N Component/UXGA/Audio Receiver**.

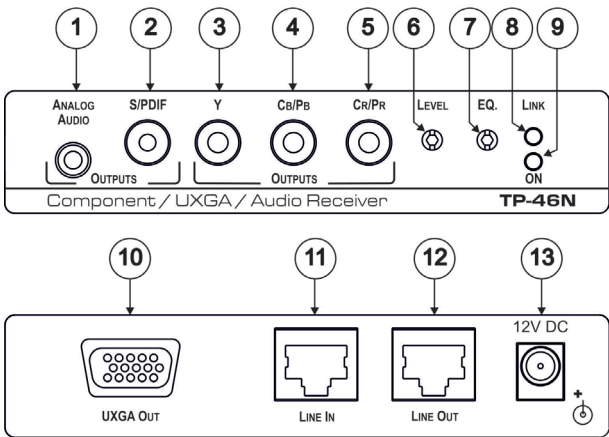


Figure 1: TP-46N Component/UXGA/Audio Receiver

#	Feature		Function
1	OUTPUTS	ANALOG AUDIO 3.5mm Mini Connector	Connect to the stereo analog audio acceptor
2		S/PDIF RCA Connector	Connect to the digital audio acceptor
3		Y RCA Connector	Connect to the component video acceptor
4		Cb/Pb RCA Connector	
5		Cr/Pr RCA Connector	
6	LEVEL Trimmer		Adjusts the output signal level Use a screwdriver to carefully rotate the trimmer, adjusting the appropriate level
7	EQ. Trimmer		Adjusts the cable compensation equalization level Use a screwdriver to carefully rotate the trimmer, adjusting the appropriate level
8	LINK LED		Lights when receiving the correct input signal
9	ON LED		Lights when receiving power
10	UXGA OUT 15-pin HD (F) Connector		Connect to the UXGA acceptor
11	LINE IN RJ-45 Connector		Connect to the LINE OUT RJ-45 connector on the TP-45 or TP-45RC Using a UTP cable with CAT 5 connectors at both ends (the PINOUT is defined in Section 4.3)
12	LINE OUT RJ-45 Connector		Connect to the LINE IN connector on an additional TP-46N Using a UTP cable with CAT 5 connectors at both ends (the PINOUT is defined in Section 4.3)
13	12V DC		+12V DC connector for powering the unit

4 Connecting a Component/UXGA/Audio Distribution System

The Component/UXGA/Audio Distribution System can be configured to operate in one of two video modes:

- In the UXGA mode, a computer graphics source is connected to the input and transmitted to a display connected to the receiver (see [Section 4.1](#))
- In the component video mode, a component video source is connected to the input and transmitted to a TV set connected to the receiver (see [Section 4.2](#))

The Component/UXGA/Audio Distribution System can be configured to operate in one of two audio modes:

- In the analog mode, an analog audio source is connected to the input and transmitted to an acceptor connected to the receiver (see [Section 4.1](#))
- In the digital audio mode, an S/PDIF audio source is connected to the input and transmitted to a digital acceptor connected to the receiver (see [Section 4.2](#))

The modes of the system are determined by setting the VIDEO SELECT and AUDIO SELECT switches on the **TP-45** or **TP-45RC**. Whatever modes are set at the transmitter, the video and audio signals are sent to the receiver and to any additional cascaded receivers.

There is no signal conversion; a component input cannot be sent to a computer graphics output, nor can a digital audio input be sent to an analog audio output.

4.1 Connecting the System in UXGA Mode

To configure a **TP-46N** component/UXGA/audio distribution system in the UXGA mode (using up to 300ft (100m) of UTP cabling), as shown in [Figure 2](#), do the following:

1. On the **TP-45** or **TP-45RC**, connect the following:
 - An UXGA source (for example, the graphics card on a laptop) to the UXGA 15-pin HD (F) connector
 - An analog audio source to the ANALOG AUDIO 3.5mm mini jack (or a digital audio source to the S/PDIF RCA connector), for example, using a Kramer C-GMA/GMA cable (VGA 15-pin HD (M) with audio jack to VGA 15-pin HD (M) with audio jack)
Cables are not supplied. The complete list of Kramer cables is on our Web site at <http://www.kramerelectronics.com>.
2. On the **TP-45**, use the SELECT buttons as follows:
 - Press the video SELECT button to choose the UXGA input
 - Press the audio SELECT button to choose S/PDIF
 - Release the audio SELECT button to choose analog audio
3. On the **TP-45RC**, use the SELECT buttons as follows:
 - Momentarily press the video SELECT button. The UXGA LED lights when the UXGA input is selected
 - Momentarily press the AUDIO SELECT button to toggle between the S/PDIF and analog audio inputs
The analog audio LED lights when analog audio is selected.
4. On the **TP-46N**, connect the following:
 - The UXGA OUT 15-pin HD (F) connector to the UXGA acceptor (for example, a display)
 - The ANALOG AUDIO 3.5mm mini jack to the analog audio acceptor (for example, speakers)
Alternatively, you can connect a digital audio acceptor to the S/PDIF RCA connector, or you can connect both.

5. Connect the LINE OUTPUT RJ-45 connector on the **TP-45** to the LINE IN RJ-45 connector on the **TP-46N**, via CAT 5 cabling, see [Section 4.3](#).
6. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity on both the **TP-45** and the **TP-46N** (not shown in [Figure 2](#)).
The signal from the UXGA source is transmitted via CAT 5 cable, decoded and converted at the UXGA OUT 15-pin HD (F) connector to the UXGA acceptor.
If you cannot connect the power to both the **TP-45** and **TP-46N**, you can connect the power to the **TP-46N** alone (see [Section 3.1](#)).
7. If required, connect the LINE OUT RJ-45 connector on the **TP-46N** to an additional **TP-46N**.

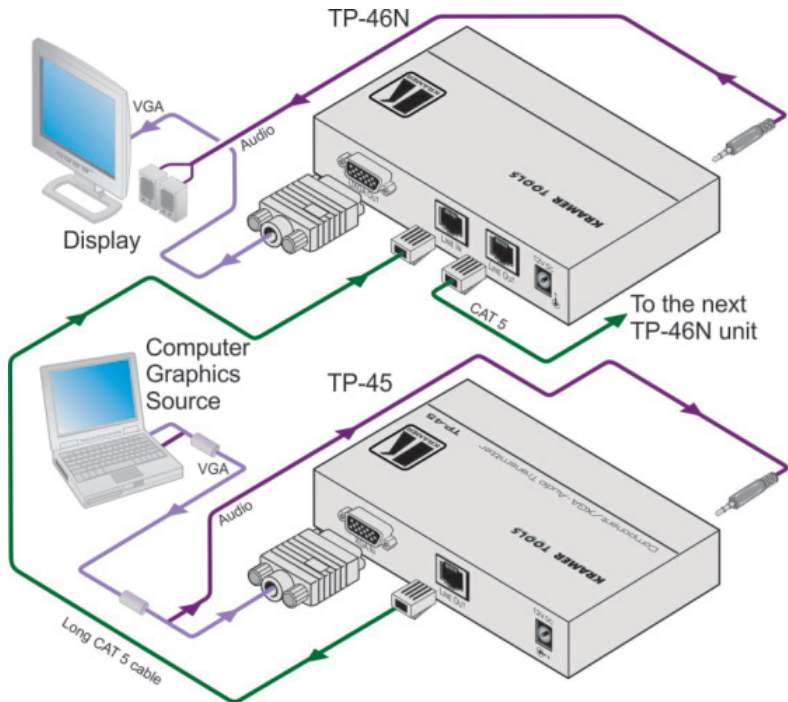


Figure 2: Distribution System, UXGA Mode

4.2 Connecting the System in Component Video Mode

To configure a **TP-46N** component/UXGA/audio distribution system in the component video mode (using up to 300ft (100m) of UTP cabling), as shown in [Figure 3](#), do the following:

1. On the **TP-45** or **TP-45RC**, connect the following:
 - A component video source (for example, a DVD player) to the Y, Cb/Pb, Cr/Pr RCA connectors
 - A digital audio source to the S/PDIF RCA connector
Alternatively, you can connect an analog audio source.
2. On the **TP-45**, use the SELECT buttons as follows:
 - Release the video SELECT button to choose the component video input
 - Press the audio SELECT button to choose S/PDIF
 - Release the audio SELECT button to choose analog audio
3. On the **TP-45RC**, use the SELECT buttons as follows:
 - Momentarily press the VIDEO SELECT button. The UXGA LED turns off when the component video input is selected
 - Momentarily press the AUDIO SELECT button to toggle between the S/PDIF and analog audio inputs
The analog audio LED lights when analog audio is selected.
4. On the **TP-46N**, connect the following:
 - The Y, Cb/Pb, Cr/Pr RCA connectors to a component video acceptor (for example, a plasma display)
 - The S/PDIF RCA connector to the digital audio acceptor (for example, the audio input on the plasma display)
Alternatively, you can connect an analog audio acceptor, or you can connect both.
5. Connect the LINE OUTPUT RJ-45 connector on the **TP-45/TP-45RC** to the LINE IN RJ-45 connector on the **TP-46N**, via CAT 5 cabling, see [Section 4.3](#).

6. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity on both the **TP-45/TP-45RC** and the **TP-46N** (not shown in [Figure 3](#)).

The signal from the component video source is transmitted via the CAT 5 cable; decoded and converted to component video and outputted on the Y, CB/PB, CR/PR OUTPUTS RCA connectors to the component video acceptor. If you cannot connect the power to both the **TP-45** and **TP-46N**, connect it to the **TP-46N** only. If more than one **TP-46N** is connected, connect the power to each **TP-46N** unit

7. Connect the LINE OUT RJ-45 connector on the **TP-46N** to a second **TP-46N** unit (optional) (connect the required outputs to the second **TP-46N**).
8. Similarly, you can connect the LINE OUT RJ-45 connector on the **TP-46N** to additional **TP-46N** units.

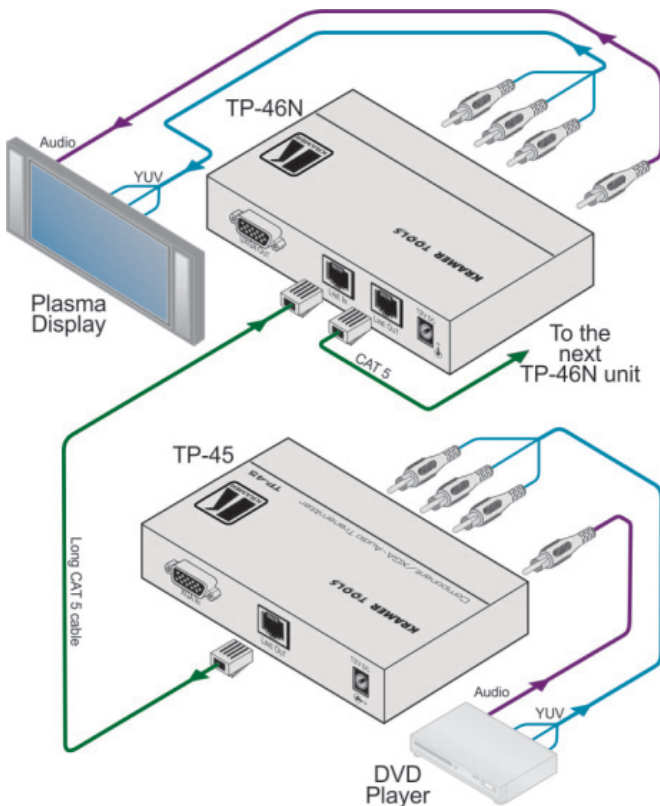


Figure 3: Distribution System, Component Video Mode

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

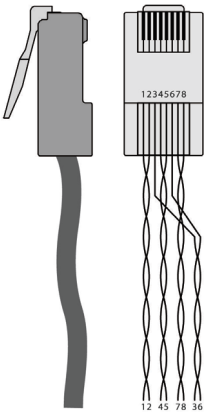
This section defines the CAT 5 pinout, using a straight pin-to-pin cable with RJ-45 connectors.



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 4: CAT 5 PINOUT



5 Technical Specifications

Video Specifications	
INPUTS:	1 CAT 5 line In on an RJ-45 connector (video/audio)
OUTPUTS:	1 CAT 5 line Extension on an RJ-45 connector (video/audio) 1 VGA/UXGA 1Vpp/75Ω on a 15-pin HD connector 1 component 1Vpp/75Ω (Y,Pb,Pr) on 3 RCA connectors
MAX. INPUT LEVEL:	VGA: 1.2Vpp on 75Ω, DC coupling Y,Pb,Pr: 1.05Vpp on 75Ω, AC coupling
RETURN LOSS:	-18dB
MAX. OUTPUT LEVEL:	VGA: 1.5Vpp on 75Ω, DC coupling Y,Pb,Pr: 1.25Vpp on 75Ω, DC coupling
VIDEO RESOLUTION:	Up to UXGA; 1080p
S/N RATIO:	61dB RMS unweighted
K-FACTOR:	0.2%
ISOLATION (CROSSTALK):	-43dB @ 5MHz
AUDIO Specifications	
OUTPUTS:	1 stereo analog audio, 0dBu/1kΩ, 0.5V/75Ω, on a 3.5mm jack 1 digital S/PDIF audio on an RCA connector
MAX. AUDIO INPUT LEVEL ANALOG:	4dBu on 50kΩ, AC coupling
MAX. AUDIO OUTPUT LEVEL ANALOG:	4dBu on 1kΩ, DC coupling
AUDIO BANDWIDTH:	20Hz to 20kHz, @ 0dBu
TND+NOISE:	0.33% @ 0dBu @ 1kHz
SAMPLE RATE CONVERSION:	48kHz
RESOLUTION CONVERSION:	24 bits
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
POWER SOURCE:	12V DC; 140mA (TP-45/RC), 280mA (TP-46N)
DIMENSIONS:	12 cm x 7.2 cm x 2.8 cm (4.7" x 2.8" x 1.1") W, D, H
WEIGHT:	0.3kg (0.67lbs) approx
ACCESSORIES:	Power supply
OPTIONS:	RK-3T 19" rack adapter
Specifications are subject to change without notice at http://www.kramerelectronics.com Video specifications are for 100m of CAT 5 UTP cable, unless otherwise specified	

LIMITED WARRANTY

We warrant 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 us 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.
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)



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