Kramer Electronics, Ltd.

USER MANUAL

Model:

TP-9, *Audio/Video Line Transmitter*

TP-10, *Audio/Video Line Receiver*

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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[1] that are clearly defined by function.

Thank you for purchasing the Kramer TOOLS **TP-9** *Audio/Video Line Transmitter* and Kramer TOOLS **TP-10** *Audio/Video Line Receiver* that are ideal for high-quality home cinema installations.

The **TP-9** and **TP-10** uses existing UTP cabling for an efficient, fast and uncluttered environment in:

- Studios, airports, offices and hospitals
- Security and military applications

The package includes the following items:

- **TP-9** and/or **TP-10**
- Two sets of IR emitter cables[2]
- Power supply (12V DC)
- This user manual[3]

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[4]

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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
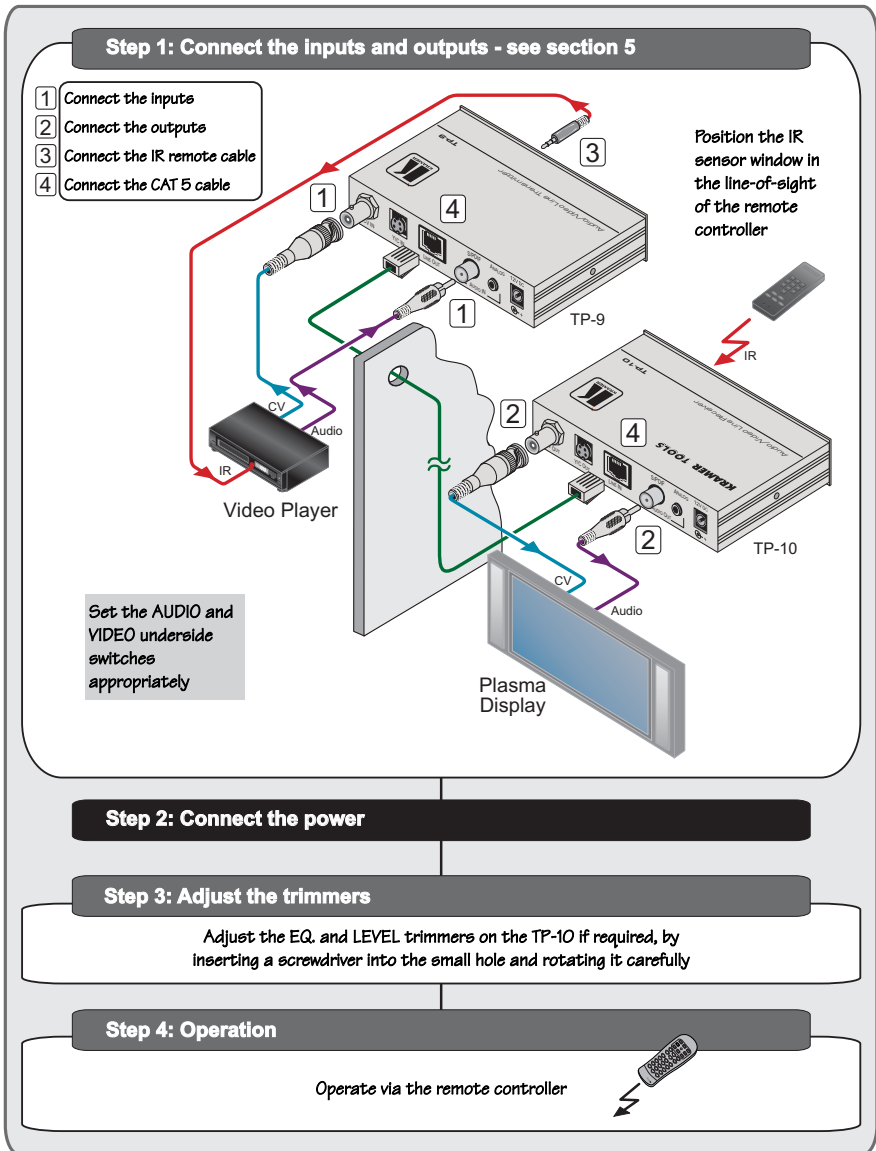
2 3.5mm to IR Emitter Control Cable (C-A35/IRE-10)

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

4 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:

Step 1: Connect the inputs and outputs - see section 5

1 Connect the inputs
2 Connect the outputs
3 Connect the IR remote cable
4 Connect the CAT 5 cable

Position the IR sensor window in the line-of-sight of the remote controller

3

1

4

1

TP-9

IR

2

4

2

TP-10

CV

Audio

IR

Video Player

Set the AUDIO and VIDEO underside switches appropriately

CV

Audio

Plasma Display

Step 2: Connect the power

Step 3: Adjust the trimmers

Adjust the EQ. and LEVEL trimmers on the TP-10 if required, by inserting a screwdriver into the small hole and rotating it carefully

Step 4: Operation

Operate via the remote controller

3   Overview

Using the **TP-9** *Audio/Video Line Transmitter* with the **TP-10** *Audio/Video Line Receiver* constitutes an *Audio/Video Line* transmitter/receiver system.

The **TP-9** accepts the audio and video input signals, encodes and sends them to the CAT 5 cable. The **TP-10** receives the CAT 5 signal, which includes both audio and video, decodes and distributes it to the audio and video acceptors. The IR signal from the remote control is transmitted from the **TP-10**, via the CAT 5 cable to the **TP-9**, which is connected to a video source, letting you control the video source via its remote control transmitter from a distance.

The **TP-9** *Audio/Video Line Transmitter* includes:

- A composite video input on a BNC connector and an s-Video (Y/C) input on a 4-pin connector
- A digital audio input (S/PDIF) and an analog stereo audio input
- IR emitter outputs for up to two machines
- A CAT 5 LINE OUT RJ-45 connector for signal transmission to the **TP-10** and IR reception

The **TP-10** *Audio/Video Line Receiver* includes:

- A composite video output on a BNC connector and an s-Video (Y/C) output on a 4-pin connector
- A digital audio output (S/PDIF) and an analog stereo audio output
- An IR sensor
- A CAT 5 LINE IN RJ-45 connector for signal reception from the **TP-9** and IR transmission
- Level and EQ. controls for the CV and Y/C signals

Kramer twisted pair adapters are an excellent way to solve remote controlling requirements without using more costly coaxial cable or fiber, or wireless transmission systems.

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 that may adversely influence signal quality and position your Kramer **TP-9** and/or **TP-10** away from moisture, excessive sunlight and dust
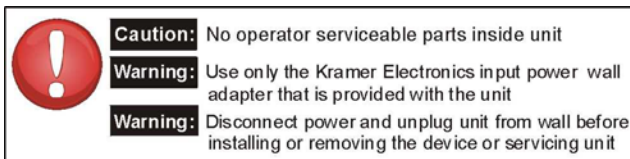
3.1 About the Power Connect Feature

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 on standard CAT 5 cable. For longer distances, heavy gauge cable should be used[1]. 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. 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. For cases where there is skewing, our UTP skew-free cable, Kramer **BC-XTP**, may be used. Bear in mind, though, that we advise using STP cables where possible, since the compliance to electromagnetic interference was tested using those cables.

Although Unshielded Twisted Pair (UTP) cable might be preferred for long range applications, the UTP cable should be installed far away from electric cables, motors and so on, which are prone to create electrical interference. However, since the use of UTP cable might cause inconformity to electromagnetic standards, Kramer does not commit to meeting the standard with UTP cable.

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

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1 CAT 5 cable is still suitable for the video/audio transmission, but not for feeding the power at these distances

4 Your Audio/Video Line Transmitter and Line Receiver

This section describes the:

- **TP-9** *Audio/Video Line Transmitter*, see section 4.1
- **TP-10** *Audio/Video Line Receiver*, see section 4.2

4.1 Your TP-9 Audio/Video Line Transmitter
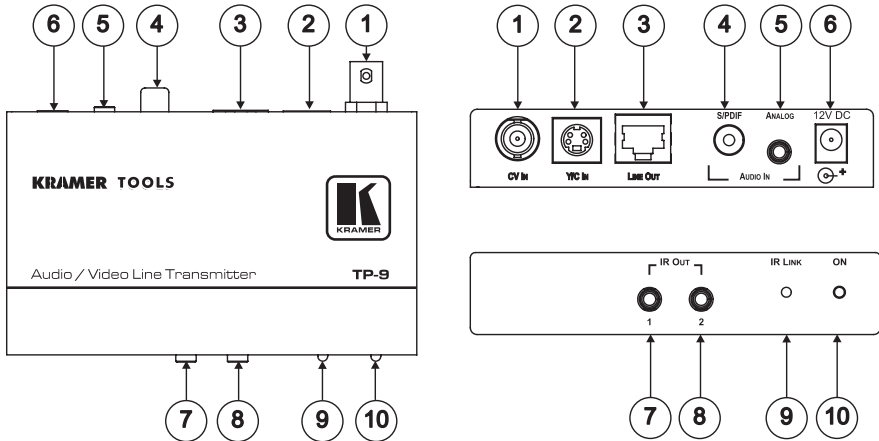
Figure 1 and Table 1 define the **TP-9** unit:

Figure 1: TP-9 Audio/Video Line Transmitter

Table 1: Features and Functions of the TP-9

#		Feature	Function
1		*CV IN* BNC Connector	Connects to the composite video source
2		*Y/C IN* 4-pin Connector	Connects to the s-Video source
3		*LINE OUT* RJ-45 Connector	Connects to the *LINE IN* connector on the **TP-10**[1]
4	*AUDIO IN*	*S/PDIF* RCA Connector	Connects to the digital audio source
5		*ANALOG* 3.5mm Mini connector	Connects to the analog audio source
6		*12V DC*	+12V DC connector for powering the unit
7	*IR OUT*	3.5mm Mini connector *1*	Connects to the IR emitter cable
8		3.5mm Mini connector *2*	
9		*IR LINK* LED	Lights when an IR link is established
10		*ON* LED	Lights when receiving power

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1 Using a straight pin to pin UTP cable with RJ-45 connectors at both ends (the PINOUT is defined in Table 4 and Figure 6)

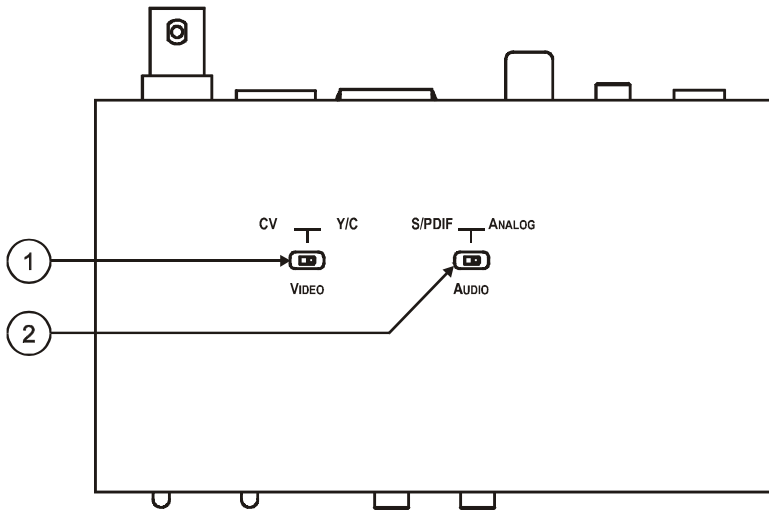Figure 2 and Table 2 define the switches on the underside of the **TP-9**:

Figure 2: TP-9 Audio/Video Line Transmitter Underside

Table 2: TP-9 Audio/Video Line Transmitter Underside Features

#	Feature		Function
1	*VIDEO* Input Selector Switch	CV	Set to CV to transmit composite video
		Y/C	Set to Y/C to transmit s-Video
2	*AUDIO* Input Selector Switch	*S/PDIF*	Set to S/PDIF to transmit digital audio
		ANALOG	Set to ANALOG to transmit analog audio

4.2 Your TP-10 Audio/Video Line Receiver
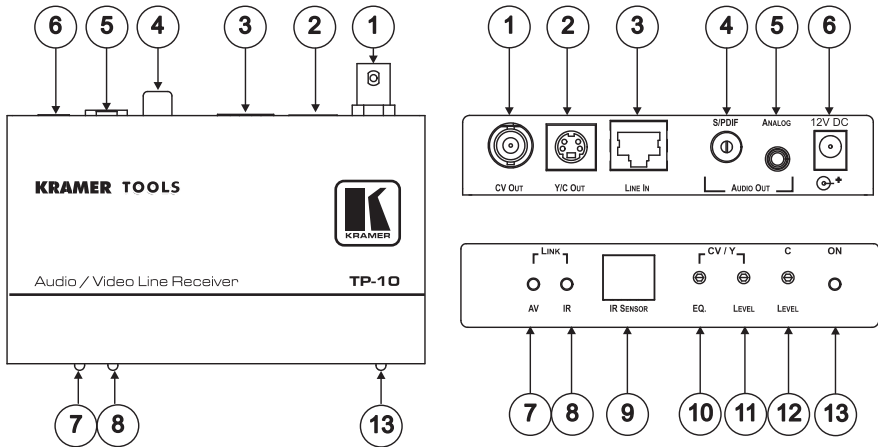
Figure 3 and Table 3 define the **TP-10** unit:

Figure 3: TP-10 Audio/Video Line Receiver

Table 3: Features and Functions of the TP-10

#	Feature		Function
1	*CV OUT* BNC Connector		Connects to the composite video acceptor
2	*Y/C OUT* 4-pin Connector		Connects to the s-Video acceptor
3	*LINE IN* RJ-45 Connector		Connects to the *LINE OUT* connector on the **TP-9**[1]
4	*AUDIO OUT*	*S/PDIF* RCA Connector	Connects to the digital audio acceptor
5		*ANALOG* 3.5mm Mini connector	Connects to the analog audio acceptor
6	*12V DC*		+12V DC connector for powering the unit
7	*LINK*	*AV* LED	Illuminates when receiving the correct input signal
8		*IR* LED	Illuminates when receiving signals from an IR remote control transmitter
9	*IR SENSOR*		IR sensor red glass window
10	*CV/Y*	*EQ.* Trimmer[2]	Adjusts[3] the video EQ. (equalization) compensation
11		*LEVEL* Trimmer[2]	Adjusts[3] composite video output signal or Y output signal
12	*C LEVEL* Trimmer[2]		Adjusts[3] the C output signal
13	*ON* LED		Lights when receiving power

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1 Using a straight pin to pin UTP cable with RJ-45 connectors at both ends (the PINOUT is defined in Table 4 and Figure 6)

2 If necessary (for example, when using a long cable), the adjustment range may be improved by opening the TP-10 cover and shorting the following jumpers: J9, for equalization, J7, for CV or Y levels, and J8, for C level

3 Insert a screwdriver into the small hole and carefully rotate it, trimming the level

5   Connecting an Audio/Video Distribution System

To configure a **TP-9**/**TP-10** audio/video distribution system (for example, for high quality home cinema system), as Figure 5 illustrates, do the following:

1. On the **TP-9** connect:
    - A composite video source (for example, a video player) to the CV IN BNC connector
    - A digital audio source (for example, the video player's audio signal) to the AUDIO IN S/PDIF RCA connector
    - The IR OUT 2, 3.5mm mini connector to the IR receiver[1] (on the video player) via the IR emitter cable (see Figure 4)

2. On the **TP-10**, connect the:
    - CV OUT BNC connector to a composite video acceptor (for example, a plasma display)
    - AUDIO OUT S/PDIF (digital audio) RCA connector[2] to an audio acceptor (for example, the plasma display's audio connector)

3. Connect the LINE OUT connector of the **TP-9** to the LINE IN connector of the **TP-10**, via UTP cabling (maximum range of up to 300ft (100m)).

4. On the **TP-9** underside, set the VIDEO switch to CV and the AUDIO switch to S/PDIF.
    Note: Do not power the device ON when set to S/PDIF. First set the device to Analog mode, power on and then switch to S/PDIF if needed.

5. On each **TP-9/TP-10** unit, connect a 12V DC power adapter to the power socket and connect the adapter to the mains electricity (see section 3.1).

6. On the **TP-10**, if required, adjust the CV EQ. and level, by inserting a screwdriver into the small hole and carefully rotating it.
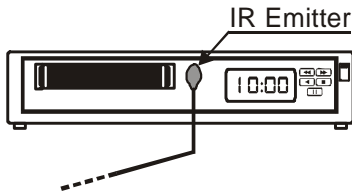

Figure 4: Connecting the IR Emitter

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1 Stick the IR emitter to the IR receiver window (usually located on the front panel of the video player)

2 You can also connect either the AUDIO OUT ANALOG 3.5mm mini connector to an analog audio acceptor, or both AUDIO OUT connectors

> Be sure to place the TP-10 in such a way that the IR SENSOR window will be in the line-of-sight of your IR remote controller.

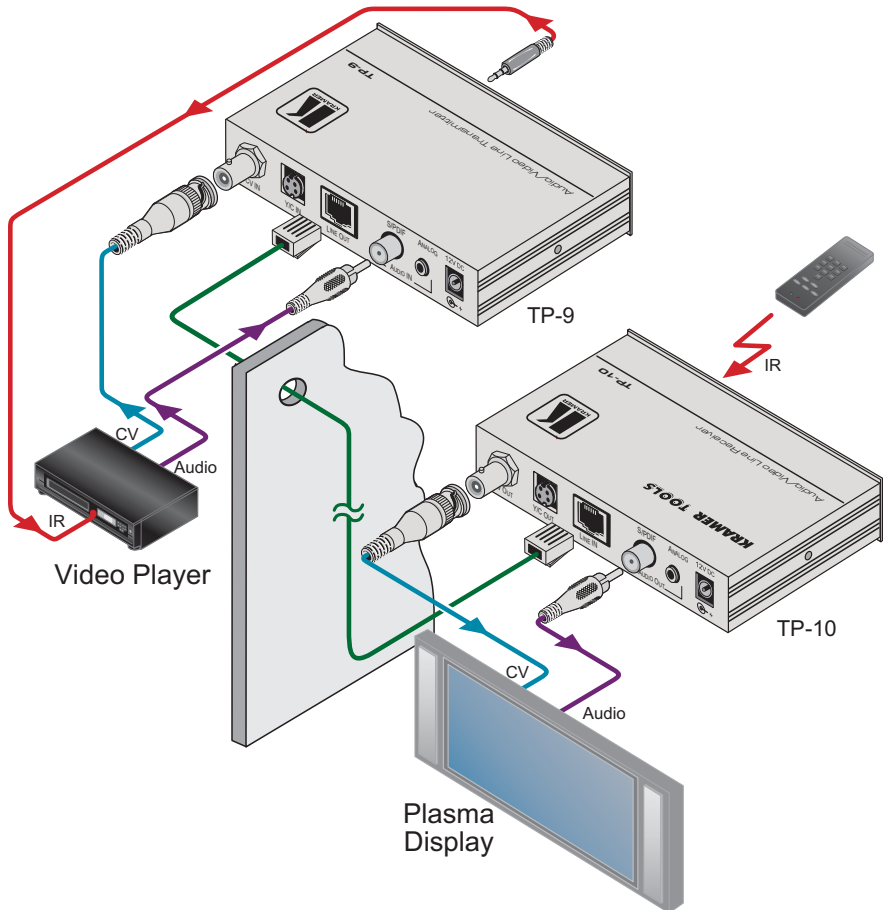You can now operate the video player via its IR remote controller from a distance.

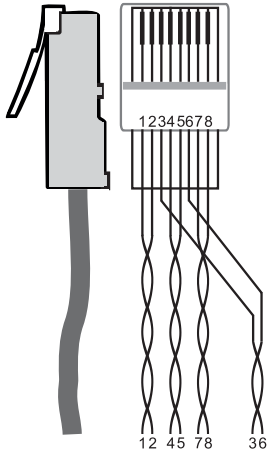*Figure 5: Audio/Video Distribution System up to 300ft (100m) UTP Cable*

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

Table 4 and Figure 6 define the CAT 5 PINOUT, using a straight pin-to-pin cable with RJ-45 connectors:

Figure 6: CAT 5 PINOUT

Table 4: CAT 5 PINOUT

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

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

6 Technical Specifications

Table 5 defines the technical specifications[1]:

Table 5: Technical Specifications[2] of the TP-9/TP-10

	TP-9	**TP-10**
INPUTS:	1 composite video 1Vpp/75Ω on a BNC connector 1 s-Video 1Vpp/75Ω [Y], 0.3Vpp/75Ω [C] on a 4-pin connector 1 S/PDIF (digital audio) on an RCA connector 1 audio (analog audio) <0dBu on a 3.5mm mini connector	1 RJ-45 CAT-5 shielded connector (LINE IN)
OUTPUTS:	1 RJ-45 CAT-5 shielded connector (LINE OUT) 2 IR emitters on 3.5mm mini connectors	1 composite video 1Vpp/75Ω on a BNC connector 1 s-Video 1Vpp/75Ω [Y], 0.3Vpp/75Ω [C] on a 4-pin connector 1 S/PDIF (digital audio) on an RCA connector 1 audio (analog audio) <8dBu on a 3.5mm mini connector

VIDEO Specifications		
MAX. OUTPUT LEVEL:	2.6V	
BANDWIDTH:	≥70MHz/-3dB	
NON-LINEARITY:	<0.05%	
DIFF. GAIN:	<0.05%	
DIFF. PHASE:	0.09Deg	
S/N RATIO:	>75dB RMS/5MHz weighted	
AUDIO Specifications		
MAX. OUTPUT LEVEL:	0dBu	
BANDWIDTH:	20Hz to 20kHz/0.1dB	
CONVERSION SAMPLE RATE:	48kHz	
CONVERSION RESOLUTION:	24 bits	
S/N RATIO:	>73dB	
POWER SOURCE:	12V DC, 95mA	12V DC, 82mA
DIMENSIONS:	12cm x 6.95cm x 2.76cm (4.7" x 2.8" x 1.08") W, D, H	
WEIGHT:	0.3 kg (0.67 lbs.) approx	
ACCESSORIES:	Power Supply, 3.5mm to IR Emitter Control Cable (C-A35/IRE-10)	
OPTIONS:	15m (50ft) cable and 20m (65ft) IR Emitter Extension Cables	

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1 Specifications for 100m of CAT 5 UTP cable, unless otherwise specified

2 Specifications are subject to change without notice

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.

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)

![Kramer logo]

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

<table>
<tr><td>⚠
Caution</td><td>**Safety Warning**:
Disconnect the unit from the power supply before opening/servicing.</td></tr>
</table>

ISO 9001:2008
IQC
Institute of
Quality & Control
Certified Quality Management System

$C\epsilon$

P/N: 2900-000144   Rev: 3