

Kramer Electronics, Ltd.



USER MANUAL

Models:

PT-110, *XGA Line Transmitter*

WP-110, *XGA Line Transmitter*

PT-120, *XGA Line Receiver*

TP-120, *XGA 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 groups¹ that are clearly defined by function.

Thank you for purchasing the Kramer Pico TOOLS **PT-110 XGA Line Transmitter**, Kramer Wall Plate **WP-110 XGA Line Transmitter**, Kramer Pico TOOLS **PT-120 XGA Line Receiver**, and/or Kramer TOOLS **TP-120 XGA Line Receiver**, which are ideal for:

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

The package includes the following items:

- **PT-110 XGA Line Transmitter** or **WP-110 XGA Line Transmitter** or **PT-120 XGA Line Receiver** or **TP-120 XGA Line Receiver**
- Power adapter (12V DC Input) and this user manual²

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 cables³

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 the Internet at <http://www.kramerelectronics.com>

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

3 Overview

This section describes:

- A summary of the **PT-110 XGA Line Transmitter**, see section [3.1](#)
- A summary of the **WP-110 XGA Line Transmitter**, see section [3.2](#)
- A summary of the **PT-120 XGA Line Receiver**, see section [3.3](#)
- A summary of the **TP-120 XGA Line Receiver**, see section [3.4](#)
- The power connect feature, see section [3.5](#)
- Using shielded twisted pair (STP) / unshielded twisted pair (UTP), see section [3.6](#)
- Recommendations for achieving the best performance, see section [3.7](#)

3.1 PT-110 XGA Line Transmitter

Using an XGA Line Transmitter—the **PT-110** or **WP-110**—with the **PT-120** or **TP-120** constitutes a VGA/XGA-to-Twisted Pair Transmitter and Receiver.

The Kramer Pico TOOLS **PT-110** is an XGA line transmitter that receives an XGA signal and transmits it over a CAT 5 cable to the **PT-120** or **TP-120** receiver. In particular, the **PT-110**:

- Has a resolution of up to UXGA
- Can use the simplest UTP CAT 5 cables, and performs even better with higher quality cables
- Has the Power Connect feature
- Is 12V DC fed

3.2 WP-110 XGA Line Transmitter

The Kramer Wall Plate **WP-110** is an XGA line transmitter—available in three versions: one for the USA, one for Belgium and Germany, and one for the UK and most of Europe¹—that receives an XGA signal and transmits it over a CAT 5 cable to the **PT-120** or **TP-120** receiver. In particular, the **WP-110**:

- Has a resolution of up to UXGA
- Can use the simplest UTP CAT 5 cables, however, it benefits from better quality cables
- Has the power connect feature
- Is powered via a standard 12V DC feed

¹ Excluding Belgium and Germany

3.3 PT-120 XGA Line Receiver

The Kramer Pico TOOLS **PT-120** is an XGA line receiver that receives a coded CAT 5 signal transmitted by either the **WP-110** or the **PT-110**, decodes it and converts it to an XGA output. In particular, the **PT-120**:

- Has an operating range of more than 300ft (more than 100m) using standard CAT 5 cable and the **WP-110** or the **PT-110**
- Includes EQ. and level controls
- Has the power connect feature
- Is 12V DC fed

3.4 TP-120 XGA Line Receiver

The Kramer TOOLS **TP-120** is an XGA line receiver that receives a coded CAT 5 signal transmitted by either the **WP-110** or the **PT-110**, decodes it and converts it to an XGA output. In particular, the **TP-120**:

- Has an operating range of more than 300ft (more than 100m) using standard CAT 5 cable and the **WP-110** or the **PT-110**
- Includes EQ. and level controls
- Has the power connect feature
- Is 12V DC fed

3.5 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 used¹. 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.

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

3.6 Shielded Twisted Pair (STP) / Unshielded Twisted Pair (UTP)

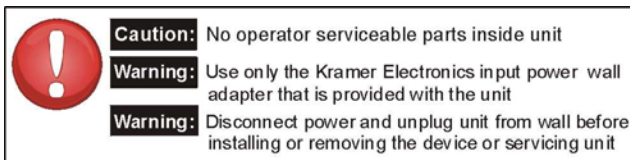
We recommend that you use Shielded Twisted Pair (STP) cable. There are different levels of STP cable available, and we advise you to use the best quality STP cable that you can afford. Our non-skew-free cable, Kramer **BC-STP** is intended for analog signals where skewing is not an issue. For cases where 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.

3.7 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables¹ 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 and position your Kramer *XGA Line Transmitter(s) / Receiver* away from moisture, excessive sunlight and dust



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

4 Your XGA Line Transmitter(s) / Receiver

This section defines the XGA Line Transmitter(s) / Receiver:

- **PT-110** XGA Line Transmitter (see section [4.1](#))
- **WP-110** XGA Line Transmitter (see section [4.2](#))
- **PT-120** XGA Line Receiver (see section [4.3](#))
- **TP-120** XGA Line Receiver (see section [4.4](#))

4.1 Your PT-110 XGA Line Transmitter

[Figure 1](#) and [Table 1](#) define the **PT-110**:

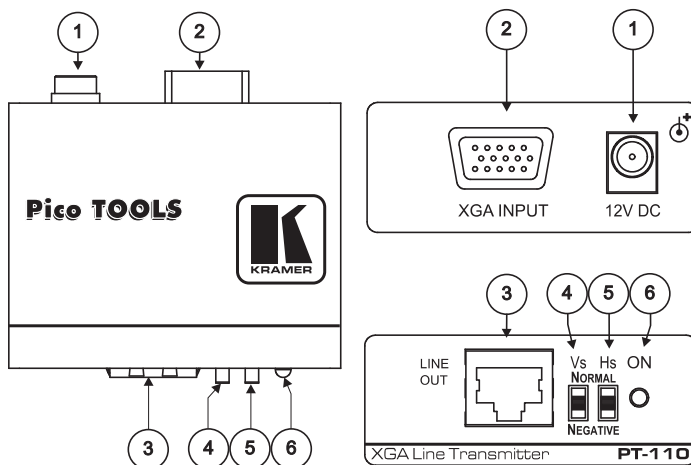


Figure 1: PT-110 XGA Line Transmitter

Table 1: PT-110 Features

#	Feature	Function
1	12V DC	+12V DC connector for powering the unit
2	XGA INPUT 15-pin HD F Connector	Connect to the XGA source
3	LINE OUT RJ-45 Connector	Connects to the LINE IN RJ-45 connector on the PT-120 or TP-120 XGA Line Receiver ¹
4	VS Switch	Slide down to set the V SYNC to negative polarity (NEGATIVE); slide up ² to set the V SYNC to positive polarity (NORM)
5	HS Switch	Slide down to set the H SYNC to negative polarity (NEGATIVE); slide up ² to set the H SYNC to positive polarity (NORM)
6	ON LED	Illuminates when receiving power

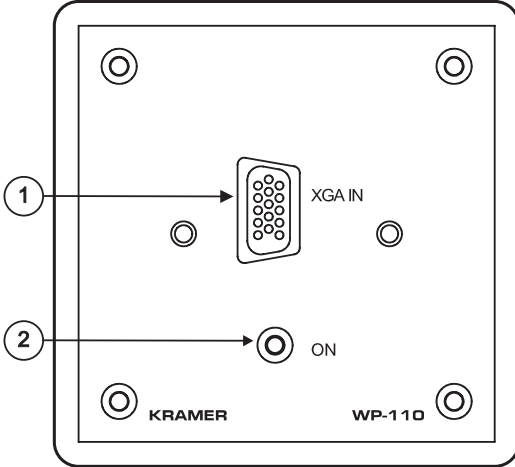
¹ Using a UTP cable with CAT 5 connectors at both ends (the PINOUT is defined in [Table 5](#) and [Figure 6](#))

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

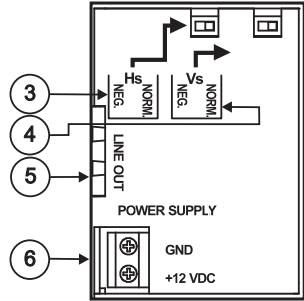
4.2 Your WP-110 XGA Line Transmitter

The **WP-110** is available in three versions: one for the US, one for Belgium and Germany, and one for the UK and most of Europe¹, as [Figure 2](#) and [Table 2](#) define:

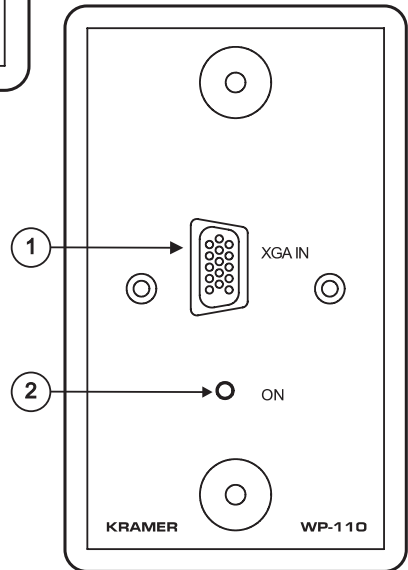
Version for the UK and most of Europe:



Side Panel View



Version for the USA:



Version for Belgium and Germany:

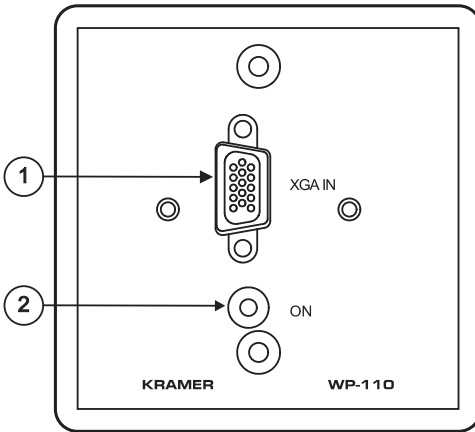


Figure 2: WP-110 XGA Line Transmitter

¹ Excluding Belgium and Germany

Table 2: WP-110 XGA Line Transmitter Features

#	Feature	Function	
1	XGA IN 15-pin HD (F) Connector	Connect to the XGA source	
2	ON LED	Illuminates when receiving power	
3	HS ³ Switch	Slide the switch to the left ¹ to change the HS polarity to (NEG.) negative polarity ² ; slide the switch to the right (NORM.) to retain the polarity	
4	VS ³ Switch	Slide the switch to the left ¹ to change the VS polarity to (NEG.) negative polarity ² ; slide the switch to the right (NORM.) to retain the polarity	
5	LINE OUT RJ-45 Connector	Connects to the LINE IN RJ-45 connector on the PT-120 or TP-120 XGA Line Receiver ⁴	
6	POWER SUPPLY	GND PIN	Connect (-) to the Ground
		+12V DC PIN	Connect (+) to the connector for powering the unit

4.3 Your PT-120 XGA Line Receiver

This section describes the PT-120 XGA Line Receiver.

Figure 3 and Table 3 define the topside of the PT-120 XGA Line Receiver:

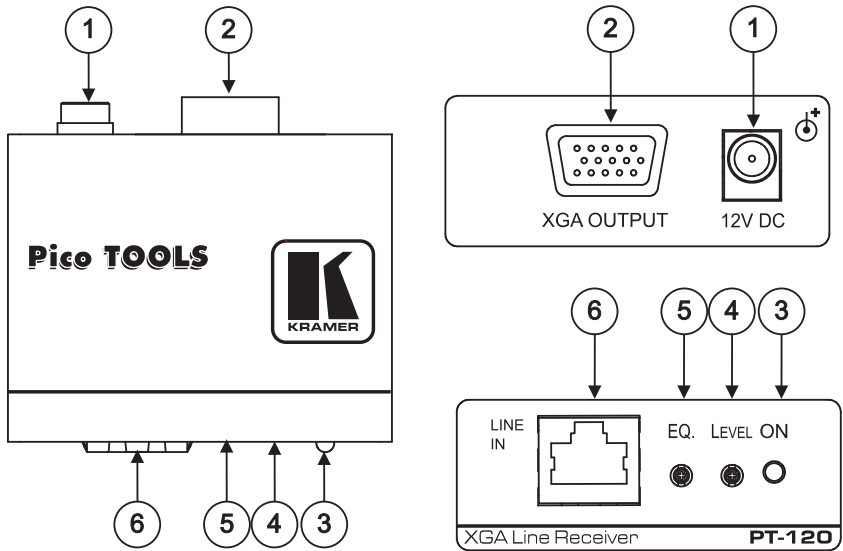


Figure 3: PT-120 XGA Line Receiver

1 By default, both switches are set to the right

2 Downgoing syncs

3 SYNC

4 Using a UTP cable with CAT 5 connectors at both ends (the PINOUT is defined in Table 5 and Figure 6)

Table 3: PT-120 XGA Line Receiver Features

#	Feature	Function
1	12V DC	+12V DC connector for powering the unit
2	XGA OUTPUT 15-pin HD (F) Connector	Connect to the XGA acceptor
3	ON LED	Illuminates when receiving power
4	LEVEL Trimmer	Adjusts ¹ the output signal level
5	EQ. ² Trimmer	Adjusts ¹ the cable compensation equalization level
6	LINE IN RJ-45 Connector	Connects to the LINE OUT RJ-45 connector on the PT-110 or WP-110 XGA Line Receiver ³

4.4 Your TP-120 XGA Line Receiver

This section describes the **TP-120 XGA Line Receiver** and its underside. [Figure 4](#) and [Table 4](#) define the topside of the **TP-120 XGA Line Receiver**:

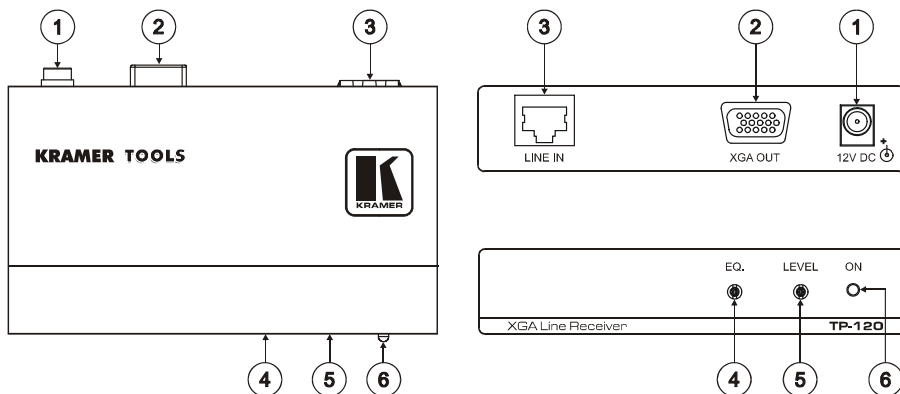


Figure 4: TP-120 XGA Line Receiver

Table 4: TP-120 XGA Line Receiver Features

#	Feature	Function
1	12V DC	+12V DC connector for powering the unit
2	XGA OUT 15-pin HD (F) Connector	Connect to the XGA acceptor
3	LINE IN RJ-45 Connector	Connects to the LINE OUT RJ-45 connector on the PT-110 or WP-110 XGA Line Receiver ³
4	EQ. ² Trimmer	Adjusts ¹ the cable compensation equalization level
5	LEVEL Trimmer	Adjusts ¹ the output signal level
6	ON LED	Illuminates when receiving power

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

2 Degradation and VGA/XGA signal loss can result from using long cables (due to stray capacitance), sometimes leading to a total loss of sharpness in high-resolution signals

3 Using a UTP cable with CAT 5 connectors at both ends (the PINOUT is defined in [Table 5](#) and [Figure 6](#))

5 Using the XGA Line Transmitter(s) / Receiver

You can use the **PT-110**¹ *XGA Line Transmitter* and the **TP-120** *XGA Line Receiver* to configure an XGA-to-Twisted Pair Transmitter and Receiver system.

To connect the **PT-110** *XGA Line Transmitter* with the **TP-120** *XGA Line Receiver*, as the example in [Figure 5](#) illustrates, do the following:

1. On the **PT-110**, connect the XGA source (for example, the 15-pin HD output from a computer's graphics card) to the XGA INPUT 15-pin HD (F) connector.
2. On the **TP-120**, connect the XGA OUT 15-pin HD (F) connector to the XGA acceptor (for example, a monitor).
3. Connect the LINE OUTPUT RJ-45 connector on the **PT-110** to the LINE IN RJ-45 connector on the **TP-120**, via UTP cabling (with a range of more than 300ft (>100m)).
4. On both² the **PT-110** and the **TP-120**, connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity.
The signal from the XGA source is transmitted via CAT 5 cable, decoded and converted at the XGA OUT 15-pin HD (F) connector to the XGA acceptor.
5. On the **TP-120**, adjust³ the output signal level and/or cable compensation equalization level, if required.
6. If necessary, set the H SYNC and V SYNC switches⁴, on the underside of the **PT-110**.

¹ You can use the WP-110 (not shown in [Figure 5](#)) instead of the PT-110. For details, see section [5.1](#)

² For details of the power connect feature see section [3.5](#)

³ Use a screwdriver to carefully rotate the trimmer, adjusting the appropriate level

⁴ By default, both switches are set for normal H SYNC and V SYNC polarity

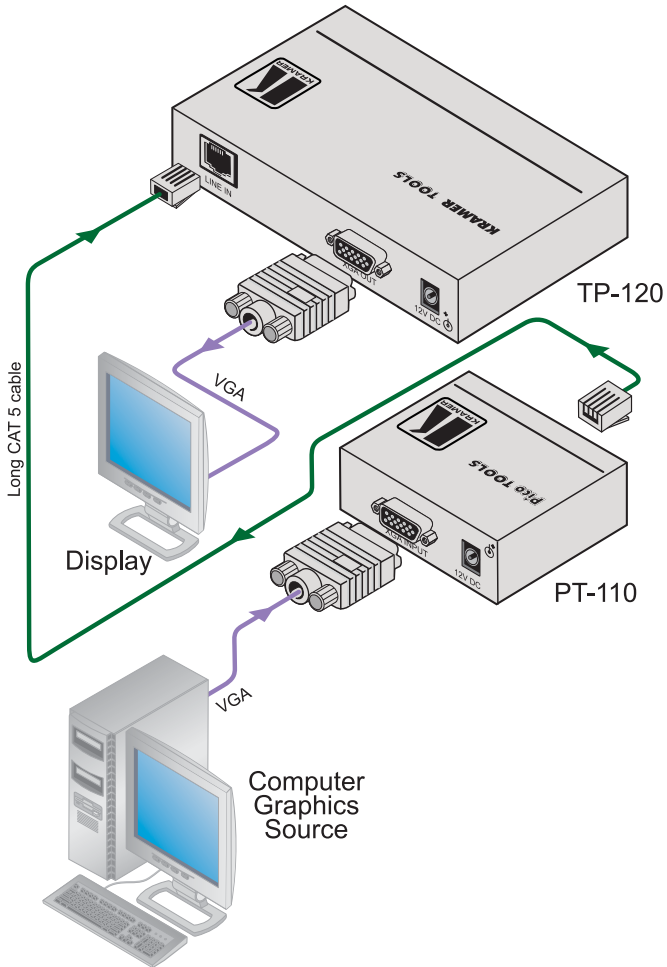


Figure 5: XGA-to-Twisted Pair Transmitter and Receiver System via UTP Cable

5.1 Installing the WP-110 XGA Line Transmitter

To install your **WP-110 XGA Line Transmitter**:

1. Connect the **LINE OUT RJ-45** connector to the pre-installed UTP wiring in the wall box opening that connects via UTP cabling to the **LINE IN RJ-45** connector of the **PT-120** or **TP-120**.
2. Connect your 12V DC power supply to the **POWER SUPPLY** pins¹, taking care that **polarity is correct**.
3. Insert the **WP-110** directly into the wall box opening, and then mount the front panel securely using the screws.
4. Connect the XGA source to the **XGA IN 15-pin HD (F)** connector.

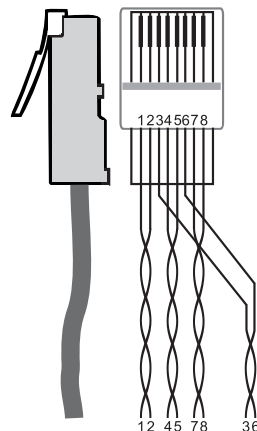
5.2 Wiring the CAT 5 LINE IN / LINE OUT RJ-45 Connectors

[Table 5](#) and [Figure 6](#) define the CAT 5 PINOUT, using a straight pin-to-pin cable with RJ-45 connectors:

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

Figure 6: CAT 5 PINOUT



¹ Connect the wire labeled “+” to the +12V pin, and the wire labeled “-” to the GND pin

6 Technical Specifications

[Table 6](#) lists the technical specifications:

Table 6: Technical Specifications¹ of the PT-110 / WP-110 / PT-120 / TP-120

	PT-110	WP-110	PT-120	TP-120
INPUTS:	1 VGA / UXGA on a 15-pin HD connector	1 VGA / UXGA on a 15-pin HD connector	1 RJ-45 LINE IN connector	1 RJ-45 LINE IN connector
OUTPUTS:	1 RJ-45 LINE OUTPUT connector	1 RJ-45 LINE OUT connector	1 VGA / UXGA on a 15-pin HD connector	1 VGA / UXGA on a 15-pin HD connector
MAX. OUTPUT LEVEL:			1.5Vpp	1.4Vpp
RESOLUTION:	Up to UXGA			
DIFF. GAIN ² :	2.9% (worst case)			
DIFF. PHASE ² :	0.3 Deg (worst case)			
K-FACTOR ² :	<0.05%			
S/N RATIO ² :	69dB (worst case)			
CONTROLS:			-7.7dB to +3.1dB, 130m level, 0dB to +25dB EQ. @ 50MHz	-7.5dB to +4.4dB, 130m level, 0dB to +33dBm 130m, EQ. @ 50MHz
COUPLING:	AC	AC	DC	AC
POWER SOURCE:	12V DC 60mA	12V DC 60mA	12V DC 175mA	12V DC 160mA
DIMENSIONS:	6cm x 6.5cm x 2.5cm (2.36" x 2.56" x 1") W, D, H	USA: 6.9cm x 3.8cm x 11.4cm (2.72" x 1.5" x 4.5") W, D, H Belgium and Germany: 8cm x 3.8cm x 8cm (3.15" x 1.5" x 3.15") W, D, H UK and most of Europe ³ : 8.6cm x 3.8cm x 8.6cm (3.39" x 1.5" x 3.39") W, D, H	6cm x 6.5cm x 2.5cm (2.36" x 2.56" x 1") W, D, H	12cm x 7.5cm x 2.5cm (4.7" x 0.98" x 2.95") W, D, H
WEIGHT:	0.14kg (0.31lbs) approx.	0.14kg (0.31lbs) approx.	0.14kg (0.31lbs) approx.	0.3kg (0.66lbs) approx.
ACCESSORIES:	Power supply			
OPTIONS:	19-inch rack adapters			

¹ Specifications are subject to change without notice

² For the transmitter/receiver pair

³ Excluding Belgium and Germany

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 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.
- 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: 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.



Kramer Electronics, Ltd.

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E-mail: info@kramerel.com

P/N: 2900-000085 REV 10