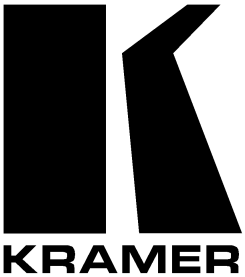
Kramer Electronics, Ltd.



USER MANUAL

Model:

TP-112HD

XGA / HD Line Transmitter - 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 350-plus different models now appear in 8 Groups[1], which are clearly defined by function. Congratulations on purchasing your Kramer TOOLS: **TP-112HD** *XGA / HD Line Transmitter - DA*, which is ideal for:

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

The package includes the following:

- **TP-112HD** *XGA / HD Line Transmitter - DA*
- Power adapter (12V DC Input)
- This user manual[2]

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[3]

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 **TP-112HD**, see section 3.3
- Recommendations for achieving the best performance, see section 3.4

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

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 over the same cable. The Power Connect feature applies as long as the cable is heavy gauge cable (that is, it can carry power). The distance does not exceed 50 meters on standard CAT5 cable.

For a distance of 100 meters, separate power supplies must be connected to the transmitter and to the receiver simultaneously, unless using heavy gauge cable.

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 non apparent).

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 and so on, which are prone to create electrical interference.

3.3 About the TP-112HD

Your Kramer TOOLS **TP-112HD** *XGA / HD Line Transmitter - DA*:

- Receives a computer graphics[1] / HD[2] signal and transmits it over two CAT5 cables to appropriate receivers[3]
- Has a video bandwidth of 150MHz, with a transmission range of more than 300 ft. (more than 100 meters)
- Includes the Power Connect feature
- Is 12VDC fed

1 The terminology XGA is used throughout this manual, where this implies any RGBHV signal on an HD15 connector having a resolution from VGA up to UXGA

2 The TP-112HD accepts high definition resolutions: 480p, 576p, 720p, 1080i, and 1080p

3 Note that the CAT5 connectors exclude audio

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 **TP-112HD** away from moisture, excessive sunlight and dust

4 Your TP-112HD XGA / HD Line Transmitter – DA

Figure 1, Figure 2, Figure 3 and Table 1 define the **TP-112HD**:

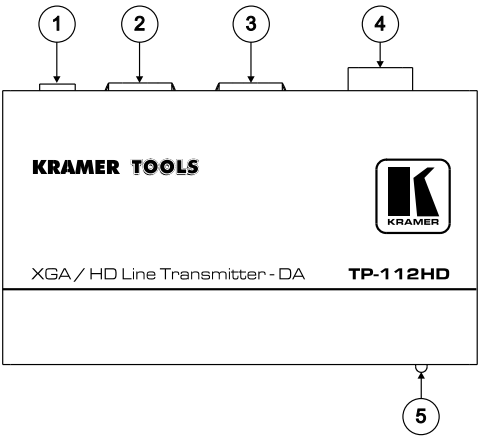

Figure 1: TP-112HD XGA / HD Line Transmitter – DA

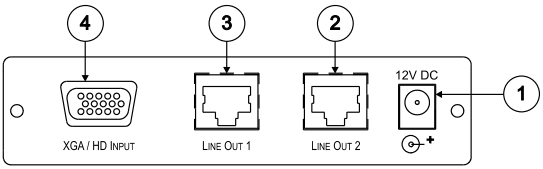

Figure 2: TP-112HD (Top Side Panel)

Figure 3: TP-112HD (Lower Side Panel)

Table 1: TP-112HD XGA / HD Line Transmitter - DA Features

#	Feature	Function
1	*12V DC*	+12V DC connector for powering the unit
2	*LINE OUT* 2 RJ-45 Connector	Connects to[1] the LINE IN RJ-45 connector on the (second) **TP-120** *XGA Line Receiver*[2]
3	*LINE OUT* 1 RJ-45 Connector	Connects to[1] the LINE IN RJ-45 connector on the (first) **TP-120** *XGA Line Receiver*[2]
4	*XGA / HD INPUT* HD15F Connector	Connect to the XGA source
5	*ON* LED	Illuminates when receiving power

Figure 4 and Table 2 define the **TP-112HD** underside panel:

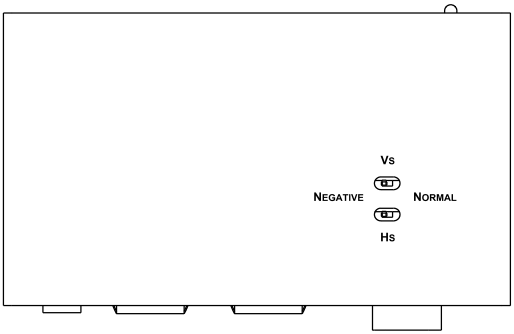

Figure 4: TP-112HD (Underside Panel)

Table 2: TP-112HD (Underside Panel) Features

#	Feature	Function
1	*VS* Switch	Slide the switch to the left[3] to change the VS polarity to NEGATIVE polarity[4]; slide the switch to the right (to NORMAL) to retain the polarity
2	*HS* Switch	Slide the switch to the left[3] to change the HS polarity to NEGATIVE polarity[4]; slide the switch to the right (to NORMAL) to retain the polarity

1 Using a UTP CAT5 cable with RJ-45 connectors at both ends (the PINOUT is defined in Table 3 and Figure 6)

2 Refer to the separate user manual: PT-110, PT-120, TP-120, WP-110, which can be downloaded from the Internet at this URL: http://www.kramerelectronics.com. Also, see the example illustrated in Figure 5

3 By default, both switches are set to the right

4 Downgoing syncs

5 Configuring a 1:2 XGA / HD-to-Twisted Pair DA System

You can use the **TP-112HD** *XGA / HD Line Transmitter – DA* with two **TP-120** *XGA Line Receiver* units[1] to configure a 1:2 *XGA / HD*-to-Twisted Pair DA system. This will let you transmit a computer graphics / HD signal to two displays via long line CAT5 UTP cabling.

To connect the **TP-112HD** to two **TP-120** units, as the example in Figure 5 illustrates, do the following:

1. On the **TP-112HD**, connect the XGA / HD source (for example, a computer graphics / HD source) to the XGA / HD INPUT HD15F connector, and connect the line output RJ-45 connector[2]:
   - OUT 1 connector to the LINE IN RJ-45 connector on the first **TP-120**
   - OUT 2 connector to the LINE IN RJ-45 connector on the second **TP-120**
2. On the two **TP-120** units, connect the:
   - XGA OUT HD15F connector of the first **TP-120** unit to the XGA / HD acceptor (for example, Display 1)
   - XGA OUT HD15F connector of the second **TP-120** unit to the XGA / HD acceptor (for example, Display 2)
3. On each of the three Kramer TOOLS, 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 the two CAT5 cables, decoded and converted at the each of the XGA OUT HD15F connectors to the XGA acceptors.
4. On the **TP-120** units, if necessary:
   - Set the H SYNC and V SYNC switches[3] on the underside
   - Adjust[4] the video output signal level and/or cable compensation equalization level
5. On the **TP-112HD**, if necessary, set the VS and HS switches[5] on the underside

1 Refer to the separate user manual: PT-110, PT-120, TP-120, WP-110, which can be downloaded from the Internet at this URL: http://www.kramerelectronics.com

2 Via UTP cabling (with a range of more than 300ft (>100m)). For details of how to wire a CAT5 LINE IN / LINE OUT RJ-45 connector, see section 5.1

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

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

5 By default, both switches are set to the right (to NORMAL) to retain the V SYNC and H SYNC polarity

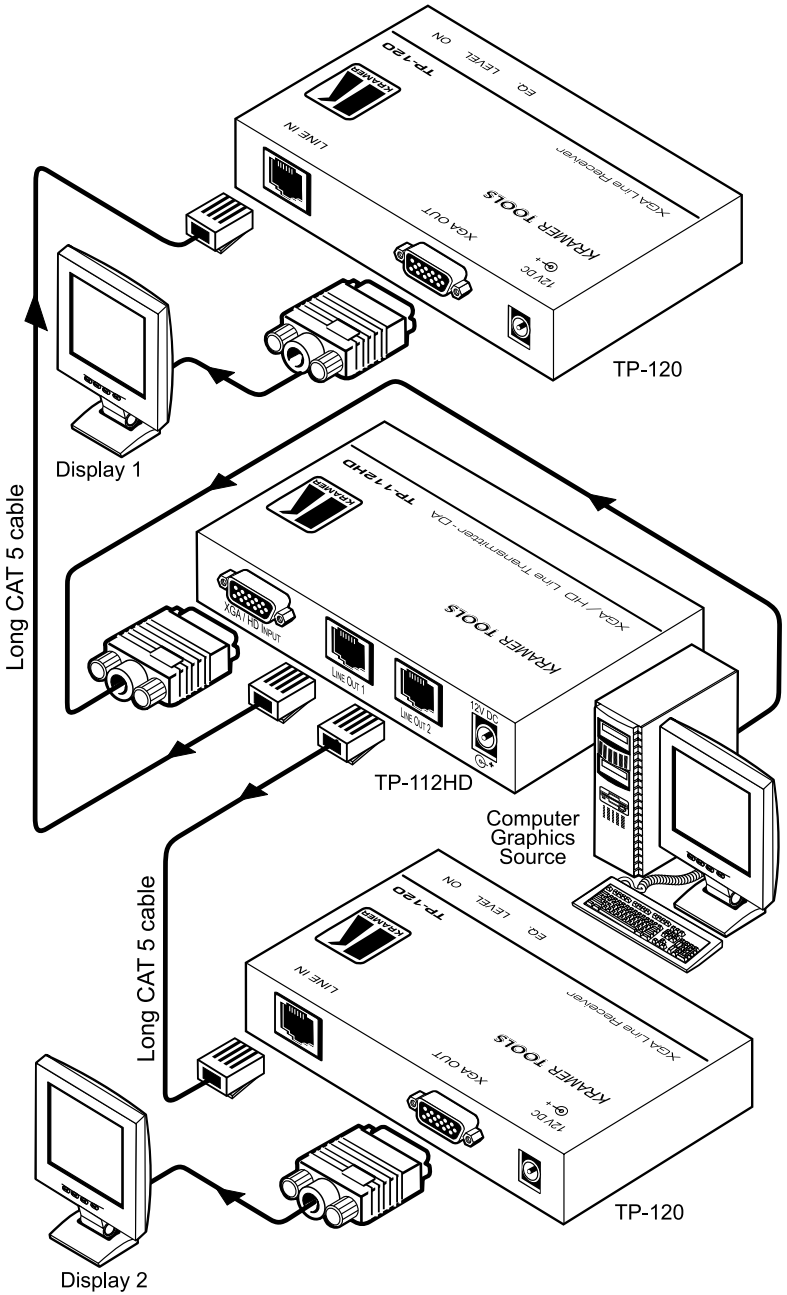

Figure 5: Configuring a 1:2 XGA / HD to Twisted Pair Transmitter / Receiver / DA

5.1 Wiring the CAT5 LINE IN / LINE OUT RJ-45 Connectors

Table 3 and Figure 6 define the UTP CAT5 PINOUT, using a straight pin to pin cable with RJ-45 connectors:

Figure 6: CAT5 PINOUT

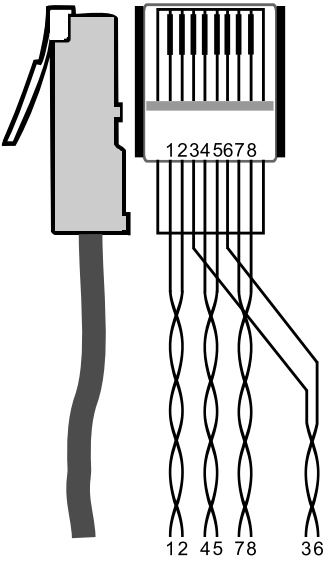

Table 3: CAT5 PINOUT

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 4 includes the technical specifications[1] of the **TP-112HD**.

Table 4: Technical Specifications of the TP-112HD (with 100m CAT5 cable)

INPUT:	1 XGA / HD on an HD15F connector
OUTPUTS:	2 RJ-45 OUT connectors
MAX. OUTPUT LEVEL:	1.7Vpp
HIGHEST RESOLUTION[2]:	UXGA, 1080P
DIFF. GAIN[2]:	4%
DIFF. PHASE[2]:	0.3 Deg
K-FACTOR[2]:	0.1%
S/N RATIO[2]:	65dB
CONTROLS[2]:	2 switches for sync inversion
COUPLING[2]:	AC
POWER SOURCE:	12 VDC 522mA[3]
DIMENSIONS:	12cm x 7.15cm 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

1 Specifications are subject to change without notice

2 For the TP-112HD Transmitter/ TP-120 Receiver SETUP

3 Sufficient for feeding two receivers via CAT5

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.
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.

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.

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

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P/N: 2900-000135 REV 1