Kramer Electronics, Ltd.

USER MANUAL

Model:

TP-102HD

XGA/HD Line Transmitter/DA

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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 your Kramer TOOLS **TP-102HD** *XGA/HD Line Transmitter/DA*, which is ideal for:

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

Each package includes the following:

- **TP-102HD** *XGA/HD Line Transmitter/DA*
- Power supply (12V DC)
- This user manual[2]

2 Getting Started

- 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]

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

3 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 steps.

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

1 Connect the inputs
2 Connect the outputs

TP-102HD

VGA

Long CAT 5 cable

Computer
Graphics Source
or
Component
Video Source

Display 1

VGA

TP-120

Step 2: Connect the power

Step 3: Change the polarity - see section 4

You can change the polarity
of H and V Sync for video:
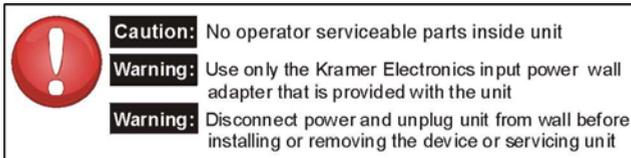
Vs

NORMAL   NEGATIVE

Hs
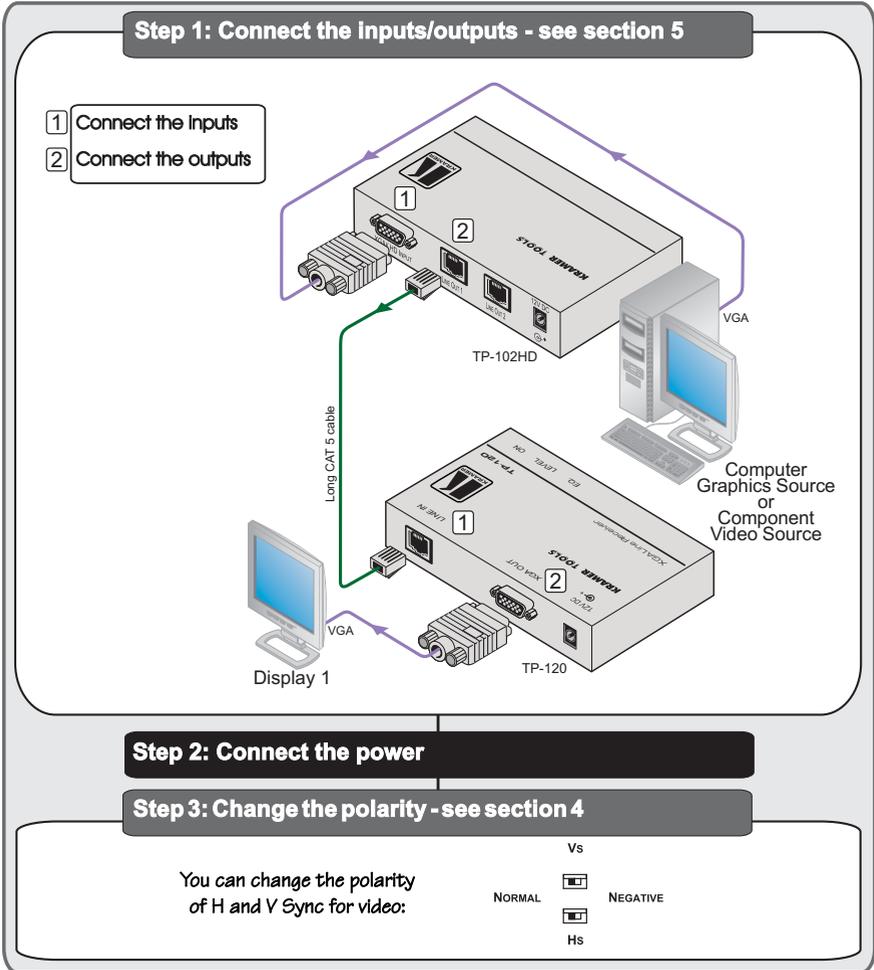
3 Overview

The **TP-102HD** is a twisted pair transmitter for computer graphics video[1] and HDTV[2] signals. It converts a computer graphics video or HDTV signal on a 15-pin HD connector to two identical twisted pair signals.

The Kramer TOOLS **TP-102HD** *XGA/HD Line Transmitter/DA* features:

- A video bandwidth of 150MHz
- A transmission range of more than 100 meters (more than 300 feet)
- The Power Connect™ feature
- 12V DC power

To achieve the best performance:

- Use only good quality connection cables[3] 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 product away from moisture, excessive sunlight and dust

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

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[4]. 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

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1 The terminology XGA is used throughout this manual, where this implies any RGBHV signal on an 15-pin HD connector having a resolution from VGA up to UXGA

2 The TP-102HD accepts high definition resolutions: 480p, 576p, 720p, 1080i, and 1080p

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

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

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.

4 Your TP-102HD XGA/HD Line Transmitter/DA

Figure 1 and Table 1 define the **TP-102HD**:
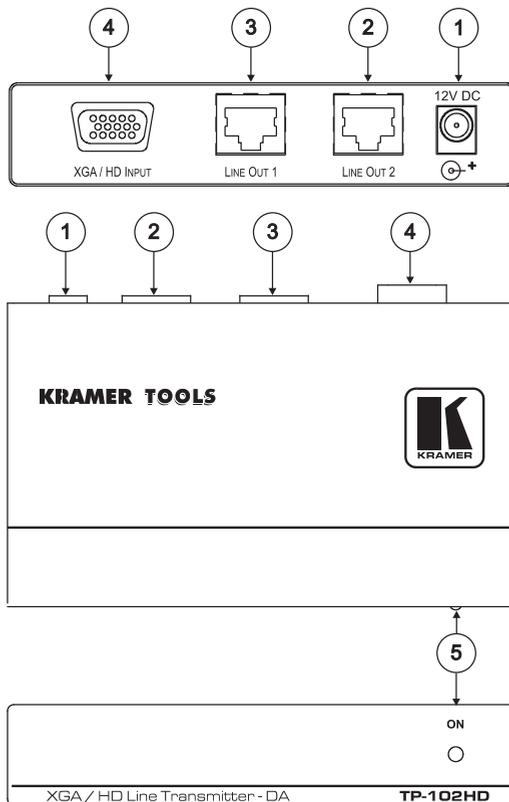
Figure 1: TP-102HD XGA/HD Line Transmitter/DA

Table 1: TP-102HD 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 IN* 15-pin HD Connector	Connect to the XGA source
5	*ON* LED	Illuminates when receiving power

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1 Using a UTP CAT 5 cable with RJ-45 connectors at both ends (the PINOUT is defined in Table 3 and Figure 4)

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 3

Figure 2 and Table 2 define the **TP-102HD** underside panel:
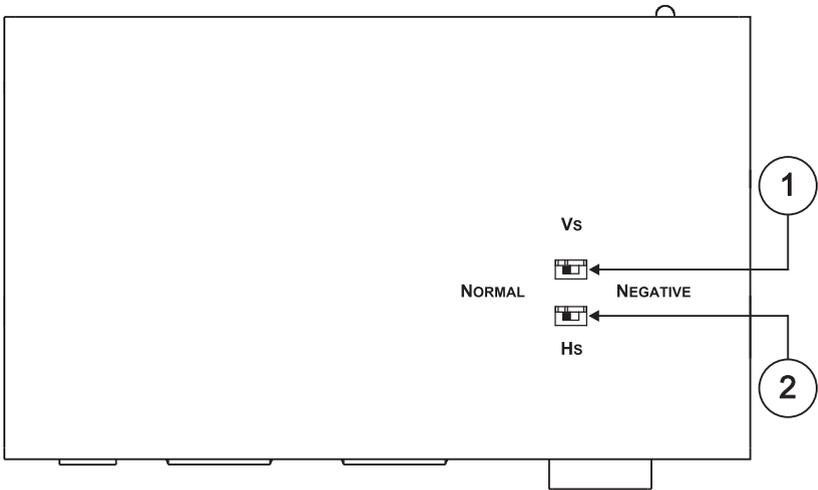
Figure 2: TP-102HD (Underside Panel)

Table 2: TP-102HD (Underside Panel) Features

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

1 By default, both switches are set to the left

2 Downgoing syncs

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

You can use the **TP-102HD** *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 that transmits a computer graphics/HD signal to two displays via long line CAT 5 UTP cabling.

To connect the **TP-102HD** to two **TP-120** units, as the example in Figure 3 illustrates, do the following:

1. On the **TP-102HD**, connect the XGA/HD source (for example, a computer graphics/HD source) to the XGA IN 15-pin HD (F) 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 15-pin HD (F) connector of the first **TP-120** unit to the XGA/HD acceptor (for example, display 1)
   - XGA OUT 15-pin HD (F) 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 CAT 5 cables, decoded and converted at the each of the XGA OUT 15-pin HD (F) 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-102HD**, if necessary, set the VS and HS switches[5] on the underside.

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

2 Via UTP cabling (with a range of more than 300ft (>100m)). For details of how to wire a CAT 5 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

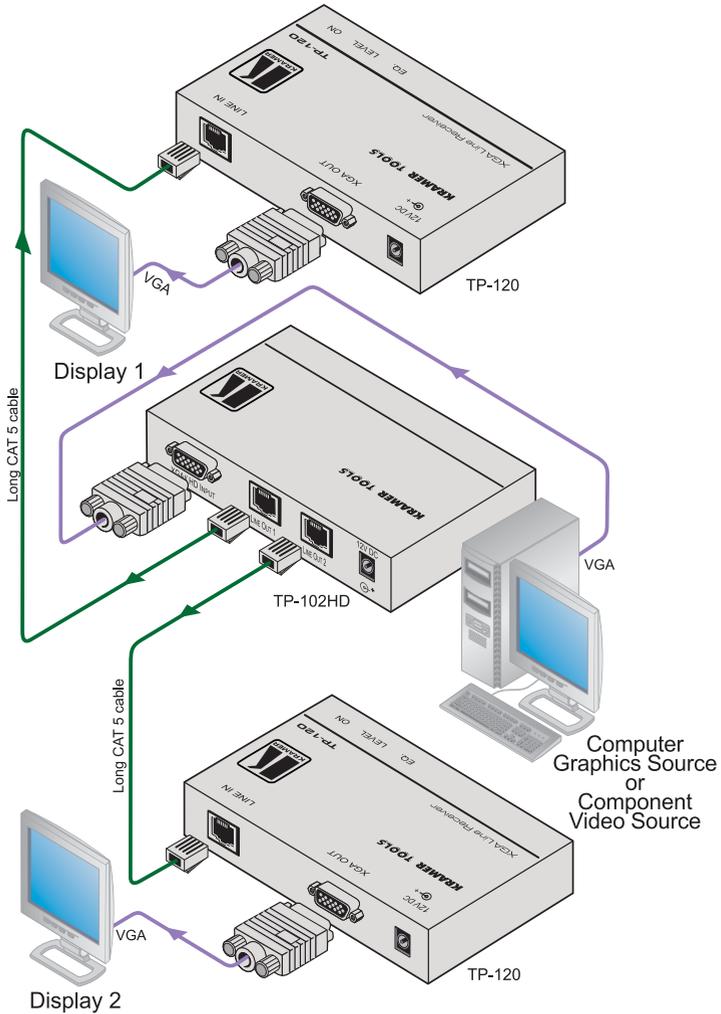5 By default, both switches are set to the left (to NORMAL) to retain the V SYNC and H SYNC polarity

*Figure 3: Configuring a 1:2 XGA/HD to Twisted Pair Transmitter/Receiver/DA*

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

Table 3 and Figure 4 define the UTP CAT 5 PINOUT, using a straight pin to pin cable with RJ-45 connectors:

Table 3: 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

Figure 4: CAT 5 PINOUT
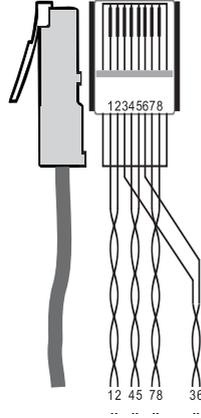
6 Technical Specifications

The **TP-102HD** technical specifications are shown in Table 4:

Table 4: Technical Specifications of the TP-102HD

INPUT:	1 XGA/HD a 15-pin HD (F) connector
OUTPUTS:	2 RJ-45 connectors
MAX. OUTPUT LEVEL:	1.7Vpp
HIGHEST RESOLUTION[1]:	WUXGA, 1080p
DIFF. GAIN[1]:	0.75%
DIFF. PHASE[1]:	0.05Deg.
K-FACTOR[1]:	0.1%
S/N RATIO[1]:	73dB
CONTROLS[1]:	2 switches for sync inversion
COUPLING[1]:	AC
POWER SOURCE:	12V DC 450mA[2]
DIMENSIONS:	12cm x 7.15cm x 2.76cm (4.7" x 2.8" x 1.08"), W, D, H
WEIGHT:	0.3kg (0.67lbs) approx.
ACCESSORIES:	RK-3T 19" rack adapter, power supply

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1 For the TP-102HD Transmitter/TP-120 Receiver setup with 100m CAT 5 cable

2 Sufficient for feeding two receivers via CAT 5

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)

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

Caution

ISO 9001:2000
IQC
Institute of
Quality & Control
Certified Quality System

C E