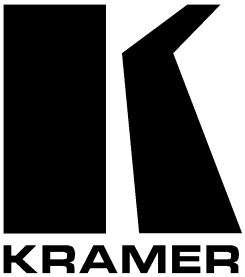
# Kramer Electronics, Ltd.




# USER MANUAL

## Model:

**TP-202**

***UXGA Line Transceiver / 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 500-plus different models now appear in 8 Groups[1], which are clearly defined by function.

Congratulations on purchasing your Kramer TOOLS **TP-202** *UXGA Line Transceiver / 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-202**
- 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]

## 2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.

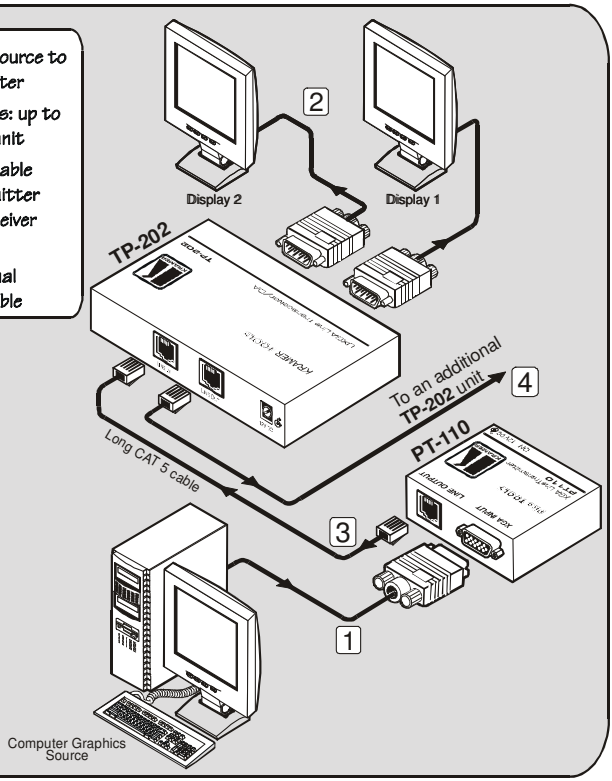
1 GROUP 1: Distribution Amplifiers; GROUP 2: Video and Audio Switchers, Matrix Switchers and Controllers; GROUP 3: Video, Audio, VGA/XGA Processors; GROUP 4: Interfaces and Sync Processors; GROUP 5: Twisted Pair Interfaces; GROUP 6: Accessories and Rack Adapters; GROUP 7: Scan Converters and Scalers; 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

## Step 1: Connect the input and the outputs

1. Connect the input source to the PT-110 transmitter
2. Connect the outputs: up to two acceptors per unit
3. Connect the CAT5 cable between the transmitter (PT-110) and the receiver (TP-202)
4. Connect an additional TP-202 via CAT5 cable




**If necessary, set the polarity of the TP-202 using the underside switches**

## Step 2: Connect the power

**If required:**

- Adjust the EQ. and LEVEL on the TP-202

# 3 Overview

This section describes:

- A summary of the **TP-202**, see section 3.1
- The power connect feature, see section 3.2
- Using shielded twisted pair (STP) / unshielded twisted pair (UTP), see section 3.3
- Recommendations for achieving the best performance, see section 3.4

## 3.1 About the TP-202 UXGA Line Receiver / DA

The Kramer TOOLS **TP-202** receives a computer graphics[1] signal which is transmitted via CAT5 cabling, and distributes it to two XGA outputs simultaneously.

The **TP-202** *UXGA Line Transceiver / DA*:

- Has a transmission range of more than 150 ft. (more than 50 meters)
- Can receive HD signals (high definition resolutions: 480p, 576p, 720p, 1080i and 1080p)
- Includes two XGA outputs on HD15F connectors
- Includes EQ. and LEVEL controls
- Can change the polarity of decoding H and V Sync for UXGA graphics
- Is 12VDC fed and can power or be powered by the receiver over the same CAT5 cable (see section 3.2)
- Features a CAT5 output for transmitting the signal to an additional receiver

## 3.2 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 via the cable connecting between the transmitter/receiver. The Power Connect feature applies as long as the cable can carry power. The distance does not exceed 50 meters on standard CAT5 cable, for longer distances, heavy gauge cable should be used[2].

For a CAT5 cable exceeding a distance of 50 meters, separate power supplies should be connected to the transmitter and to the receiver simultaneously.

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 CAT5 cable is still suitable for the video/audio transmission, but not for feeding the power at these distances

## 3.3 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 not apparent).

For long range applications, 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.

## 3.4 Recommendations for Achieving the Best Performance

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 and position your **TP-202** 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 this unit[1].

**Warning** – Disconnect power and unplug unit from wall before installing or removing device or servicing unit.

1 For example: model number AD2512C, part number 2535-000251

# 4 Your TP-202 UXGA Line Transceiver / DA

Figure 1 and Table 1 define the **TP-202**:

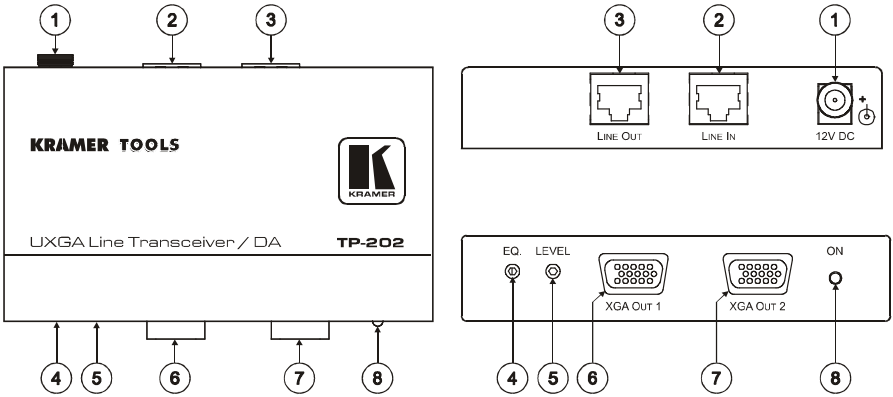



*Figure 1: TP-202 UXGA Line Transceiver / DA*

*Table 1: TP-202 UXGA Line Transceiver / DA Features*

| # | Feature | Function |
|---|---|---|
| 1 | *12V DC* | +12V DC connector for powering the unit |
| 2 | *LINE IN* RJ-45 Connector | Connect[2] to the LINE OUT RJ-45 connector on the transmitter[1] |
| 3 | *LINE OUT* RJ-45 Connector | Connect[2] to the *LINE IN* connector on an additional **TP-202** |
| 4 | *EQ.* Trimmer | Adjust[3] the cable compensation equalization level |
| 5 | *LEVEL* Trimmer | Adjust[3] the output signal level |
| 6 | *XGA OUT 1* HD15F Connector | Connect to the first XGA acceptor |
| 7 | *XGA OUT 2* HD15F Connector | Connect to the second XGA acceptor |
| 8 | *ON* LED | Illuminates when receiving power |

1 For example, the PT-110, as Figure 3 illustrates

2 Using a UTP CAT5 cable with RJ-45 connectors at both ends (the PINOUT is defined in Table 3 and Figure 4)

3 Insert a screwdriver into the small hole and carefully rotate it, to trim the appropriate level

Figure 2 and Table 2 define the **TP-202** underside panel:

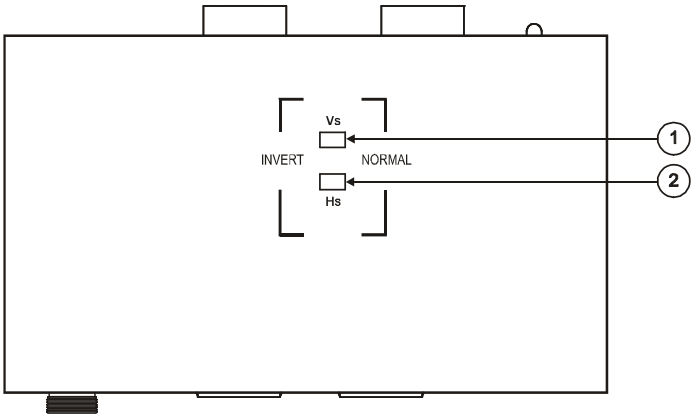



*Figure 2: TP-202 (Underside Panel)*

*Table 2: TP-202 (Underside Panel) Features*

| # | Feature | Function |
|---|---|---|
| 1 | *VS* Switch | Slide the switch to NORMAL to retain the polarity[1]<br>Slide the switch to INVERT to invert the VS polarity |
| 2 | *HS* Switch | Slide the switch to NORMAL to retain the polarity[1]<br>Slide the switch to INVERT to invert the HS polarity |

1 By default, both switches are set to NORMAL

# 5 Connecting the TP-202

You can use the **TP-202** *UXGA Line Transceiver / DA* to configure a UXGA DA system. This will let you transmit a computer graphics signal to two displays via long line CAT5 UTP cabling[1].

To connect the **TP-202**, as the example in Figure 3 illustrates, do the following:

1. Connect a transmitter (for example, the Kramer **PT-110** *XGA Line Transmitter*[2]) to the LINE IN RJ-45 connector via CAT5 cabling, see section 5.1.
2. Set the VS and HS switches on the underside of the unit to NORMAL.
3. Connect the XGA OUT 1 HD15F connector to an XGA acceptor (for example, Display 1).
4. Connect the XGA OUT 2 HD15F connector to an XGA acceptor (for example, Display 2).
5. Check the image on the display. If it is not stable, set the VS and HS switches to INVERT to obtain a stable image.
6. If required, connect the LINE OUT RJ-45 connector on the **TP-202** to an additional[3] **TP-202**.
7. If required, adjust[4] the video output signal level and/or cable compensation equalization level.
8. If necessary, set the HS and VS switches on the **TP-202** underside[5].
9. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in Figure 3).
   The signal from the UXGA source is transmitted via CAT5 cable to the **TP-202**, decoded and converted at the XGA OUT 1 and XGA OUT 2 HD15F connectors to the UXGA acceptors simultaneously.

1 By using two TP-202 units, you can transmit the signal to an additional TP-202

2 You can also connect an HD transmitter, such as the Kramer TP-219HD

3 Up to 10 units may be connected with minimal signal deterioration as long as the combined length between the first and the last units does not exceed 100 meters

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

5 By default, both switches are set to normal (see Figure 2 and Table 2)

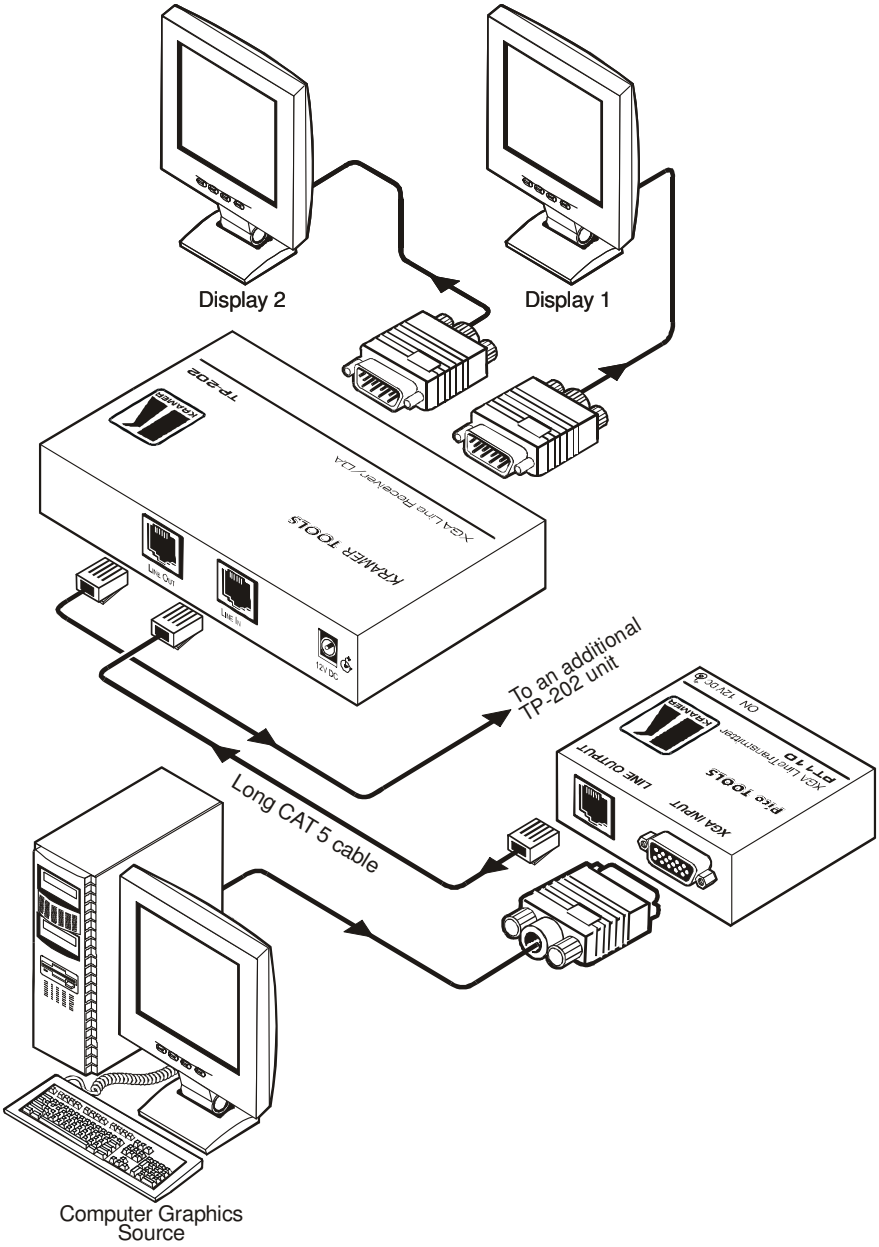



*Figure 3: Connecting the TP-202*

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

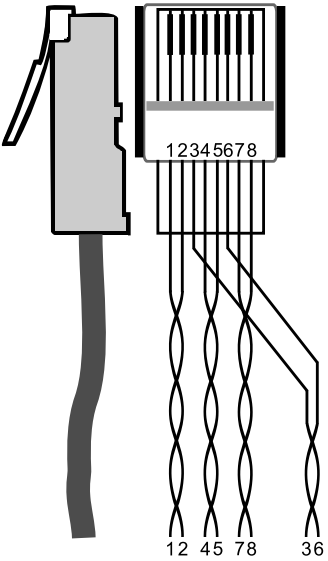
Table 3 and Figure 4 define the UTP CAT5 PINOUT, using a straight pin-to-pin cable with RJ-45 connectors:

*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 |

*Figure 4: CAT5 PINOUT*



# 6 Technical Specifications

Table 4 includes the technical specifications[1].

*Table 4: Technical Specifications[2] of the TP-202*

| | |
|---|---|
| INPUTS: | 1 CAT5 LINE IN on an RJ-45 connector |
| OUTPUTS: | 1 CAT5 LINE OUT on an RJ-45 connector<br>2 XGA on HD15F connectors |
| MAX. OUTPUT LEVEL: | 1.5Vpp |
| RESOLUTION: | Up to UXGA, up to 1080p |
| DIFF. GAIN: | 2.8% |
| DIFF. PHASE: | 0.2° |
| K-FACTOR: | 0.1% |
| S/N RATIO: | 69.2dB @5MHz |
| CONTROLS: | Level: -9.6dB to +2.3dB; Equalization: 0dB to 36.3dB @50MHz |
| COUPLING: | Receiver section: DC, looping section: AC |
| POWER SOURCE: | 12V, 525mA maximum current[3] |
| DIMENSIONS: | 12.1cm x 7.18cm x 2.42cm (4.76" x 2.83" x 0.95"), W, D, H |
| WEIGHT: | 0.3 kg. (0.67 lbs.) approx. |
| ACCESSORIES: | Power supply |

1 Specifications are subject to change without notice

2 Specifications are guaranteed for a system of two connected machines

3 When feeding TP-219HD (as the transmitter) and a looped TP-202

**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.

**Kramer Electronics, Ltd.**
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**P/N: 2900-000226 REV 2**