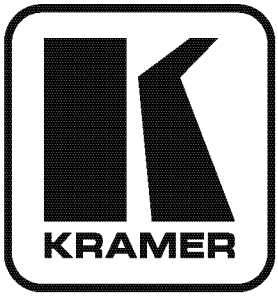
Kramer Electronics, Ltd.



USER MANUAL

Models:

VP-200XLTHD *XGA Line Amp / CAT 5 Transmitter*

VP-5THD *1:4 VGA/UXGA Distributor/CAT 5 Transmitter*

VP-5R *CAT 5 Receiver / 1:5 VGA/UXGA Distributor*

Contents

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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: **VP-200XLTHD** *XGA Line Amp / CAT 5 Transmitter*, **VP-5THD** *1:4 VGA/UXGA Distributor / CAT 5 Transmitter*, and/or **VP-5R** *CAT 5 Receiver / 1:5 VGA/UXGA Distributor* which are ideal for:

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

The package includes:

- This user manual[2]
- One or more **VP-200XLTHD**, and/or **VP-5THD**[3], and/or **VP-5R**[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]

2.1 Quick Start

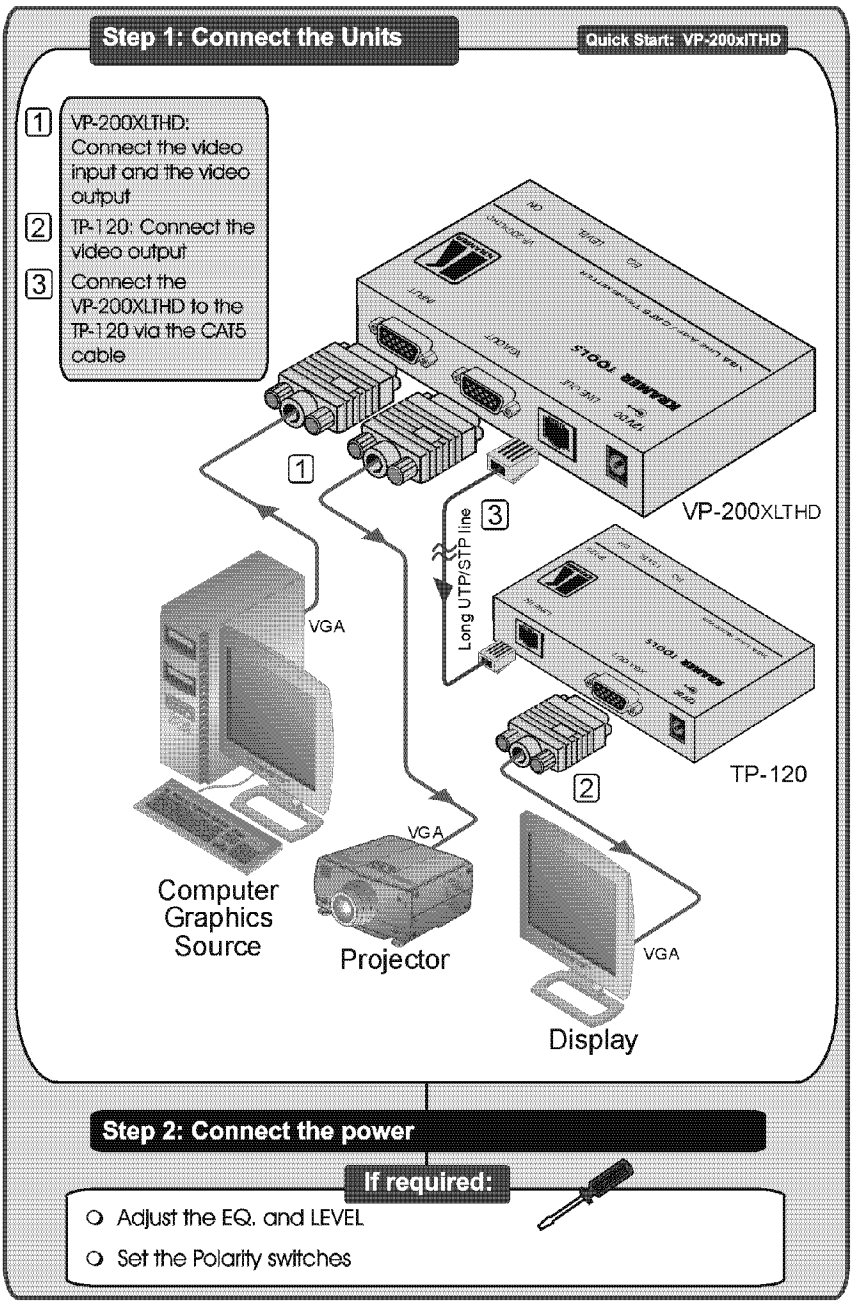
This quick start chart summarizes the basic setup and operation steps.

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 http://www.kramerelectronics.com

3 With a power cord

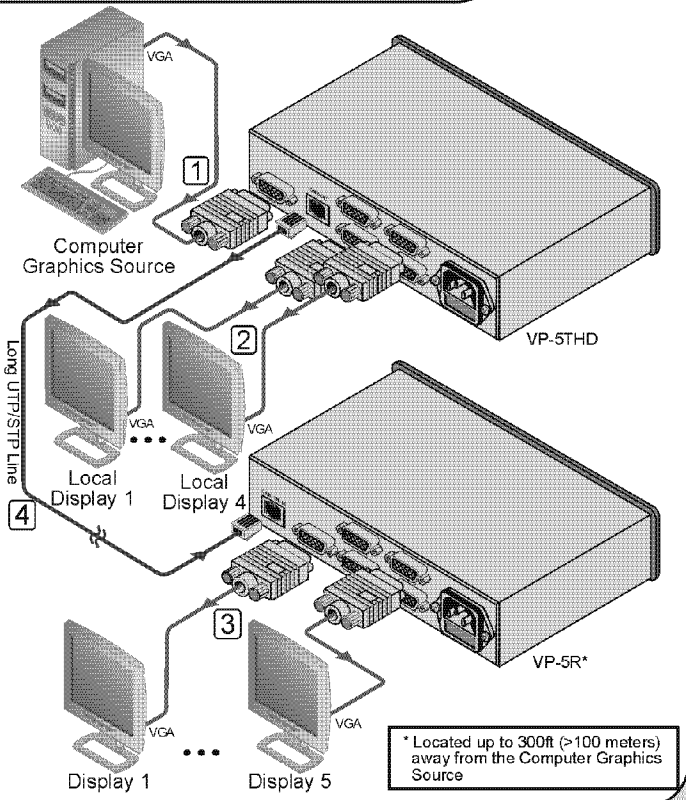
4 The complete list of Kramer cables is available at http://www.kramerelectronics.com


Step 1: Connect the Units
Quick Start: VP-200xlTHD
1 VP-200XLTHD: Connect the video input and the video output
2 TP-120: Connect the video output
3 Connect the VP-200XLTHD to the TP-120 via the CAT5 cable
VP-200XLTHD
TP-120
Long UTP/STP line
VGA
Computer Graphics Source
Projector
Display
Step 2: Connect the power
If required:
Adjust the EQ, and LEVEL
Set the Polarity switches

Step 1: Connect the Units

Quick Start: VP-5THD VP-5R

1. VP-5THD: Connect the video input
2. VP-5THD: Connect up to 4 video outputs
3. VP-5R: Connect up to 5 video outputs
4. Connect the VP-5THD to the VP-5R via the CAT 5 cable



Step 2: Connect the power

If required:

FOR THE VP-5THD:

- Adjust the EQ. and LEVEL
- Set the ID Bit Control switches
- Set the Polarity switches

FOR THE VP-5R:

- Adjust the input EQ. and LEVEL
- Adjust the output EQ.
- Set the Polarity switches

3 Overview

This user manual describes the following products:

- Kramer TOOLS **VP-200XLTHD** *XGA Line Amp / CAT 5 Transmitter*, which accepts one computer graphics input and distributes the signal to its 15-pin HD connector output, as well as transmitting it over STP cabling (CAT 5 or similar) to its appropriate receiver (see Section 4)
- Kramer **VP-5THD** *1:4 VGA/UXGA Distributor / CAT 5 Transmitter*, which is a distributor for computer graphics signals, accepting one input, and distributing the signal to its identical 4 outputs, as well as transmitting it over CAT 5 STP cable to its appropriate receiver (see Section 5)
- Kramer **VP-5R** *CAT 5 Receiver / 1:5 VGA/UXGA Distributor*, which is a distributor for computer graphics signals, receiving the computer graphics signal via CAT 5 STP cable, and distributing the signal to 5 identical 15-pin HD outputs (see Section 6)

This section describes:

- The Power Connect feature (see Section 3.1)
- Using Shielded Twisted Pair/Unshielded Twisted Pair cable (see Section 3.2)
- Recommendations for achieving the best performance (see section 3.3)

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 power over the TP cable. You can use the Power Connect feature **as long as the distance does not exceed 50m (164 feet) on standard CAT 5 cable.**

For distances exceeding 50m, separate power supplies must be connected to the transmitter and to the receiver.

3.2 Shielded Twisted Pair/Unshielded Twisted Pair

We recommend that you use Shielded Twisted Pair (STP) cable. There are different categories 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 digital signals and for analog signals where skewing is not an issue. For cases where there is skewing, our Unshielded Twisted Pair (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 has been tested using STP cables.

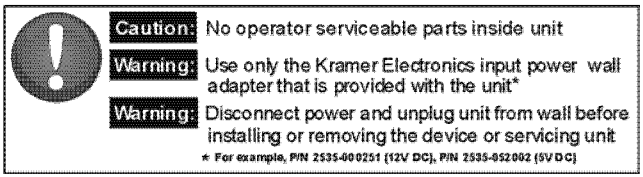
Although UTP cable might be preferred for long range applications, the UTP cable should be installed as far as possible from electric cables, motors, and so on, which often create electrical interference.

However, since the use of UTP cable might cause non-conformity to electromagnetic standards, Kramer does not commit to meeting the standard with UTP cable.

3.3 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 Kramer machines away from moisture, excessive sunlight and dust



4 Defining the VP-200XLTHD XGA Line Amp / CAT 5 Transmitter

The **VP-200XLTHD** is a high-performance XGA line amp/CAT 5 transmitter that accepts one computer graphics (XGA) input, provides necessary buffering and isolation, and distributes the signal to the 15-pin HD connector output, as well as transmitting it over STP cable to its appropriate receiver. In particular, the **VP-200XLTHD**:

- Can also accept HD signals (high-definition resolutions: 480p, 576p, 720p, 1080i and 1080p)
- Has a transmission range of more than 300ft (100m) over STP cabling
- Has a video bandwidth exceeding 400MHz, ensuring transparency even when operating at the highest resolutions
- Includes output level control and cable equalization control, via two trimmers on the front panel of the unit

Figure 1 and Table 1 define the **VP-200XLTHD.**

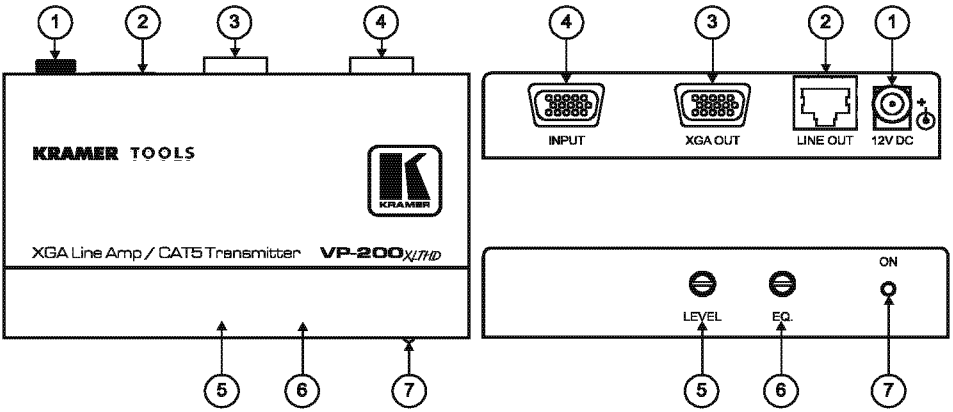


Figure 1: VP-200XLTHD XGA Line Amp / CAT 5 Transmitter

Table 1: VP-200XLTHD XGA Line Amp / CAT 5 Transmitter Features

#	Feature	Function
1	*12V DC*	Connect to the 12V DC power adapter
2	*LINE OUT* RJ-45 Connector	Connect to[1] the LINE IN RJ-45 connector on the TP-120[2] or the VP-5R
3	*XGA OUT* 15-pin HD Connector	Connect to the XGA acceptor
4	*INPUT* 15-pin HD Connector	Connect to the XGA source
5	*LEVEL* trimmer	Turn to adjust[3] the output signal level
6	*EQ.* trimmer	Turn to adjust[3] the video EQ. (equalization) compensation
7	*ON* LED	Lights when the VP-200XLTHD receives power

Figure 2 and Table 2 define the **VP-200XLTHD.**

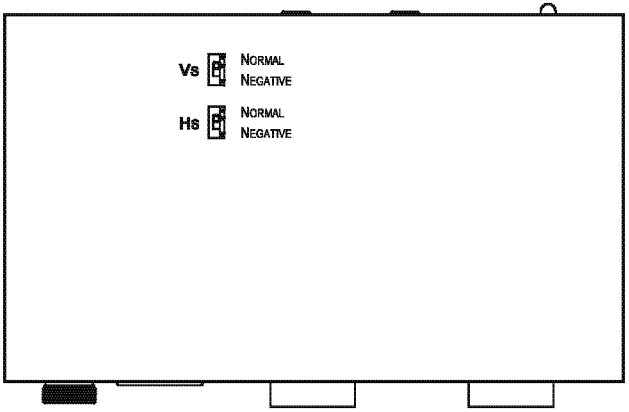


Figure 2: VP-200XLTHD XGA Line Amp / CAT 5 Transmitter Underside

1 Using an STP CAT 5 cable with RJ-45 connectors at both ends (the pinout is defined in Table 7 and Figure 9)

2 Refer to the separate user manual: PT-110, PT-120, TP-120, WP-110 available at http://www.kramerelectronics.com

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

Table 2: VP-200XLTHD XGA Line Amp / CAT 5 Transmitter Underside Features

Switch	Function
VS Switch	Slide the switch downward to change the VS polarity to negative polarity[1]; slide the switch upward to retain the polarity (default)
HS Switch	Slide the switch downward to change the HS polarity to negative polarity[1]; slide the switch upward to retain the polarity (default)

5 Defining the VP-5THD 1:4 VGA/UXGA Distributor/CAT 5 Transmitter

This section describes the front and rear panels of the **VP-5THD** *1:4 VGA/UXGA Distributor / CAT 5 Transmitter* (see Section 5.1), and the underside (see Section 5.2).

5.1 Defining the VP-5THD 1:4 VGA/UXGA Distributor / CAT 5 Transmitter

The **VP-5THD** is a high-performance distributor for computer graphics signals, accepting one input, providing necessary buffering and isolation, and distributing the signal to its four identical outputs, as well as transmitting it over STP CAT 5 cable to an appropriate receiver.

In particular, the **VP-5THD**:

- Features front panel EQ. control
- Has switches on the underside for ID Bit control
- Has a video bandwidth exceeding 440MHz, ensuring transparency even when operating at the highest resolutions
- Has a transmission range of more than 300ft (more than 100m) over STP cabling
- Is mains fed and housed in a half-width 19" enclosure
- Has Hs and Vs polarity switches on its underside
- Supports HD signals (high-definition resolutions: 720p, 1080i and 1080p) and SD signals

Figure 3 and Table 3 define the **VP-5THD.**

1 Downgoing syncs

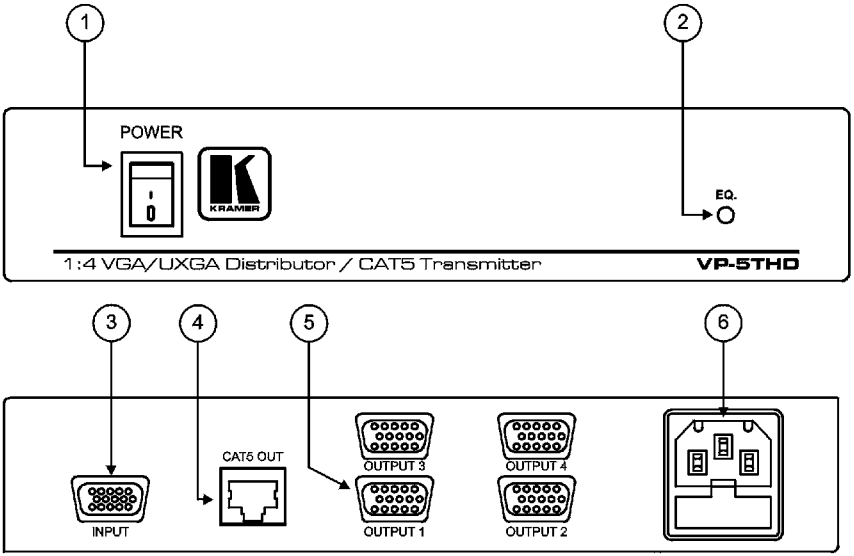


Figure 3: VP-5THD 1:4 VGA/UXGA Distributor / CAT 5 Transmitter

Table 3: VP-5THD 1:4 VGA/UXGA Distributor / CAT 5 Transmitter Features

#	Feature	Function
1	*POWER* Switch	Illuminated switch for turning the unit ON or OFF
2	*EQ.* Trimmer	Turn to adjust[1] the video EQ. (equalization) compensation
3	*INPUT* 15-pin HD Connector	Connect to the VGA/UXGA source
4	*CAT 5 OUT* RJ-45 Connector	Connect to[2] the LINE IN RJ-45 connector on the VP-5R
5	*OUTPUT* 15-pin HD Connector	Connect to the VGA/UXGA acceptor(s) (from 1 to 4)
6	Power Connector with Fuse	Connect to the AC mains using the supplied power cable

1 Insert a screwdriver into the hole and carefully rotate it, to trim the level

2 Using an STP CAT 5 cable with RJ-45 connectors at both ends (the pinout is defined in Table 7 and Figure 9)

5.2 Defining the VP-5THD Underside

Figure 4 and Table 4 define the underside of the **VP-5THD** *1:4 VGA/UXGA Distributor / CAT 5 Transmitter*.

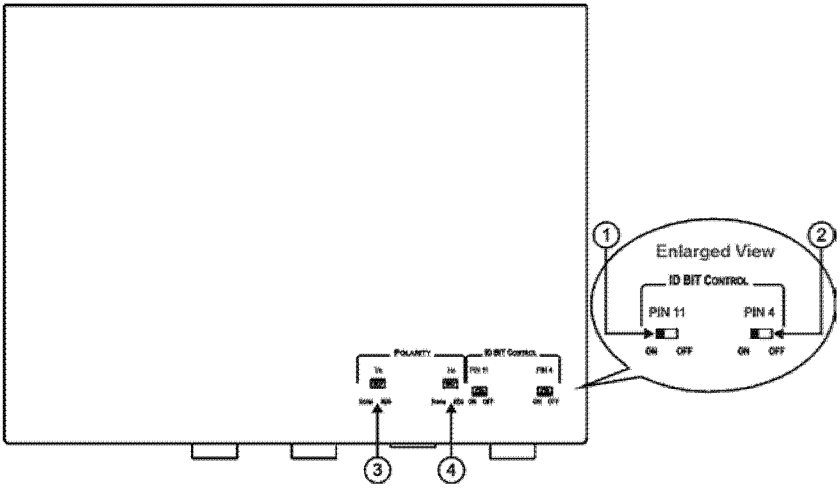


Figure 4: VP-5THD 1:4 VGA/UXGA Distributor / CAT 5 Transmitter Underside

Table 4: VP-5THD 1:4 VGA/UXGA Distributor/CAT 5 Transmitter Underside Features

#	Feature		Function
1	*ID BIT CONTROL* Switches	*PIN 11*	Slide to the left to set to ON[1]; to the right to set to OFF
2		*PIN 4*	Slide to the left to set to ON[1]; to the right to set to OFF
3	*POLARITY* Switches	*VS* Switch	Slide the switch to the right to change the VS polarity to negative polarity[2]; slide the switch to the left to retain the polarity (default)
4		*HS* Switch	Slide the switch to the right to change the HS polarity to negative polarity[2]; slide the switch to the left to retain the polarity (default)

6 Defining the VP-5R CAT 5 Receiver / 1:5 VGA/UXGA Distributor

This section defines the front and rear panels (see Section 6.1) and the underside (see Section 6.2) of the **VP-5R** *CAT 5 Receiver / 1:5 VGA/UXGA Distributor*.

6.1 Defining the VP-5R CAT 5 Receiver / 1:5 VGA/UXGA Distributor

The **VP-5R** is a high-performance distributor for computer graphics signals, receiving the computer graphics signal via STP CAT 5 cable, and distributing the signal to five identical 15-pin HD outputs.

1 The default. Enabling the notebook or laptop to output a VGA signal to an external VGA monitor

2 Downgoing syncs

In particular, the **VP-5R**:

- Features front panel line input level and EQ. control, as well as output EQ. control
- Is mains fed
- Is housed in a half-width 19" enclosure

Figure 5 and Table 5 define the **VP-5R.**

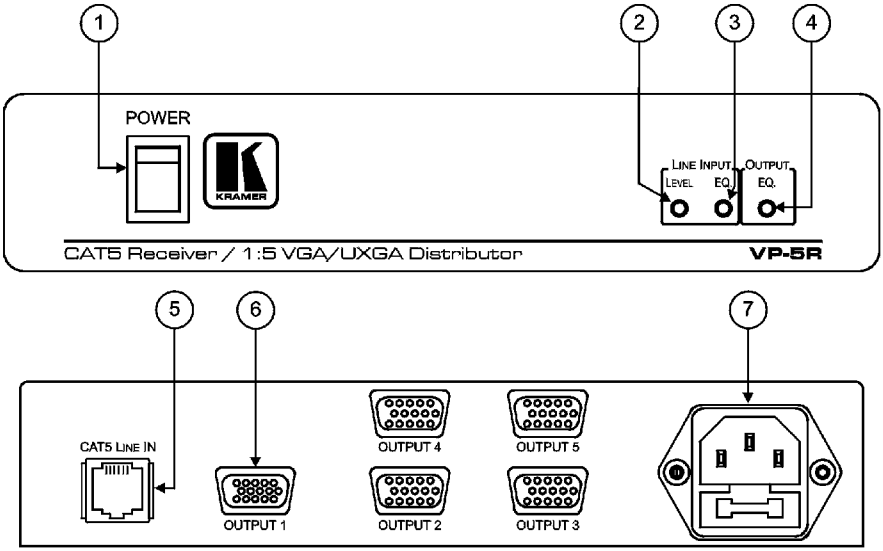


Figure 5: VP-5R CAT 5 Receiver / 1:5 VGA/UXGA Distributor

Table 5: VP-5R CAT 5 Receiver / 1:5 VGA/UXGA Distributor Features

#	Feature	Function
1	*POWER* Switch	Illuminated switch for turning the unit ON or OFF
2	*LINE INPUT LEVEL* Trimmer	Turn to adjust[1] the video input level
3	*LINE INPUT EQ.* Trimmer	Turn to adjust[1] the video input EQ. (equalization) compensation
4	*OUTPUT EQ.* Trimmer	Turn to adjust[1] the video output EQ. (equalization) compensation
5	*CAT 5 LINE IN* RJ-45 Connector	Connect to[2] the LINE OUT RJ-45 connector on the VP-5THD
6	*OUTPUT* 15-pin HD Connector	Connect to the VGA/UXGA acceptor(s) (from 1 to 5)
7	Power Connector with Fuse	Connect to the AC mains using the supplied power cable

6.2 Defining the VP-5R Underside

Figure 6 and Table 6 define the underside of the **VP-5R** *CAT 5 Receiver / 1:5 VGA/UXGA Distributor.*

1 Insert a screwdriver into the hole and carefully rotate it, to trim the level

2 Using an STP CAT 5 cable with RJ-45 connectors at both ends (the pinout is defined in Table 7 and Figure 9)

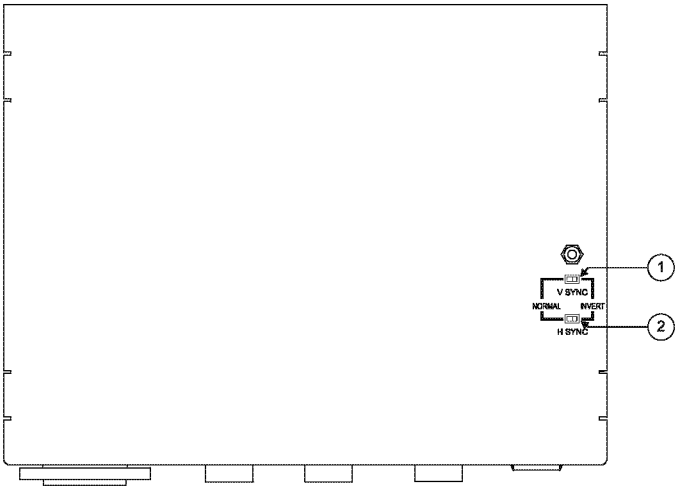


Figure 6: VP-5R CAT 5 Receiver / 1:5 VGA/UXGA Distributor Underside

Table 6: VP-5R CAT 5 Receiver / 1:5 VGA/UXGA Distributor Underside Features

#	Feature	Function
1	*V SYNC* Switch	Slide the switch to the right[1] to change the V SYNC polarity; slide the switch to the left to retain the polarity
2	*H SYNC* Switch	Slide the switch to the right[1] to change the H SYNC polarity; slide the switch to the left to retain the polarity

7 Connecting the VP-200XLTHD

You can use the **VP-200XLTHD** and, for example, the **TP-120** to configure an XGA line-to-Twisted Pair transmitter and receiver system.

To connect the VP-200XLTHD to the TP-120, as the example in Figure 7 illustrates:

1. On the **VP-200XLTHD** connect the:
   - Computer graphics (XGA) source (for example, a computer) to the INPUT 15-pin HD connector
   - XGA OUT 15-pin HD connector to the acceptor (for example, to a projector)
2. On the **TP-120**, connect the XGA OUT 15-pin HD connector to the XGA acceptor (for example, a display).
3. Connect the LINE OUT RJ-45 connector on the **VP-200XLTHD** to the LINE IN RJ-45 connector on the **TP-120** via STP cabling (see Section 8.1).
4. Connect the 12V DC power adapter to the power socket on the **VP-200XLTHD** and plug the adapter into the mains electricity socket.

1 By default, both switches are set to the left

5. Connect the other 12V DC power adapter to the power socket on the **TP-120**, and plug the adapter into the mains electricity socket.
6. On the **VP-200XLTHD**, if required, use a screwdriver to adjust the:
   - Video output signal level
   - Cable compensation equalization level
7. On the **TP-120**, if required:
   - Adjust[1] the video output signal level and/or cable compensation equalization level
   - On the underside, set the H SYNC and V SYNC switches[2]

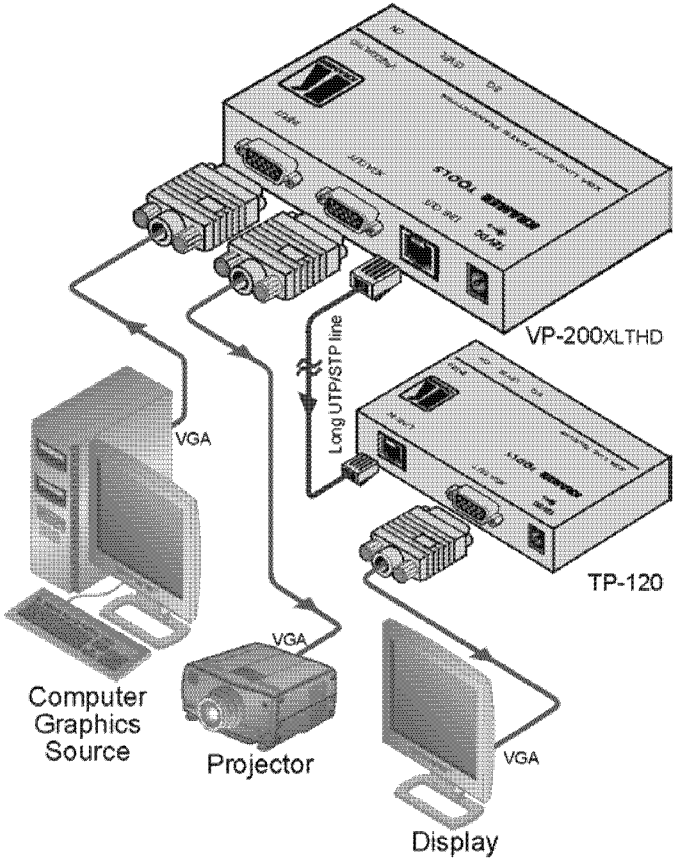


Figure 7: Connecting the VP-200XLTHD

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

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

8 Connecting the VP-5THD and the VP-5R

You can use the **VP-5THD** *1:4 VGA/UXGA Distributor / CAT 5 Transmitter* and the **VP-5R** *CAT 5 Receiver / 1:5 VGA/UXGA Distributor* to configure an XGA line-to-Twisted Pair transmitter and receiver system.

To connect the VP-5THD to the VP-5R, as the example in Figure 8 illustrates:

1. On the **VP-5THD** connect the computer graphics source (for example, a computer) to the INPUT 15-pin HD connector, and connect up to[1] four acceptors (for example, local displays) to the OUTPUT 15-pin HD connectors 1 to 4.
2. On the **VP-5R** connect[1] up to five acceptors (for example, displays) to the OUTPUT 15-pin HD connectors 1 to 5.
3. Connect the CAT 5 OUT RJ-45 connector on the **VP-5THD** to the CAT 5 LINE IN RJ-45 connector on the **VP-5R** via STP cabling (see Section 8.1).
4. Connect the supplied power cord[2] to the **VP-5THD**[3].
5. Connect the supplied power cord[2] to the **VP-5R**[3].
6. On the **VP-5THD**, if required:
   - Set the H SYNC and V SYNC switches[4] on the underside
   - Adjust[5] the front panel cable compensation equalization level
7. On the **VP-5R**, if required:
   - Adjust[5] the front panel *LINE INPUT* signal level and/or cable compensation equalization level, and/or *OUTPUT* compensation equalization level
   - On the underside, set the V SYNC and H SYNC switches[2]

1 When not all the outputs are required, connect only those that are required and leave the other output(s) unconnected

2 We recommend that you use only the power cord that is supplied with each specific unit

3 Not illustrated in Figure 8

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

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

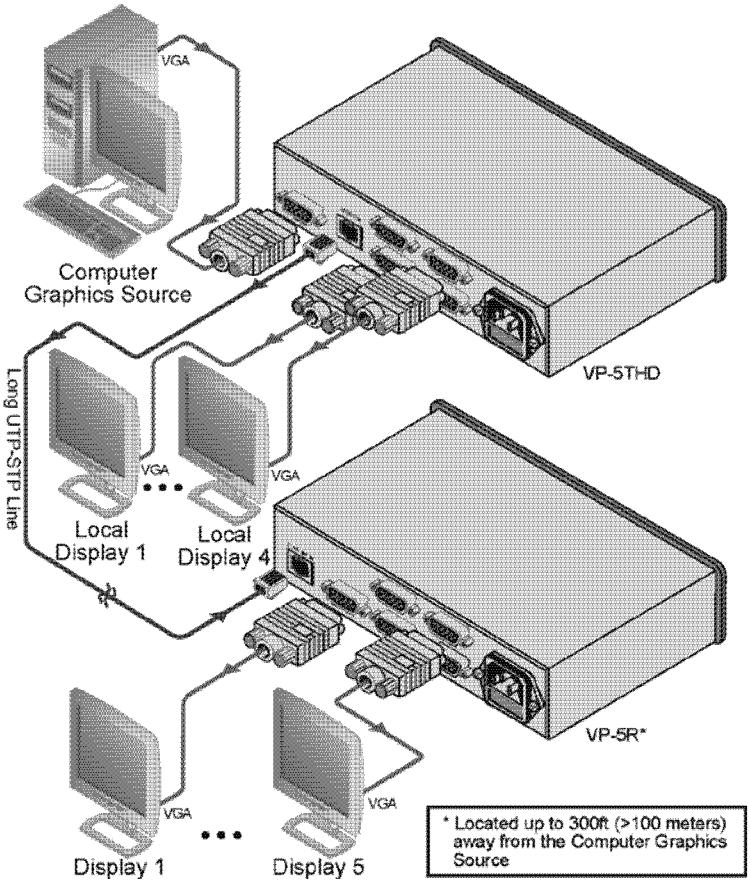


Figure 8: Connecting the VP-5THD and the VP-5R

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

Table 7 and Figure 9 define the TP CAT 5 pinout, using a straight pin to pin cable with RJ-45 connectors. When using STP cable, connect/solder the cable shield to the RJ-45 connector shield.

Table 7: TP Connector 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

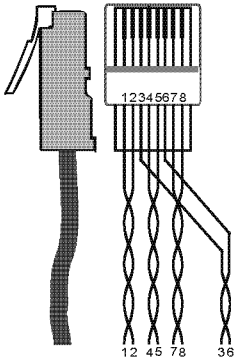


Figure 9: TP Connector

9 Technical Specifications

Table 8 lists the technical specifications of the **VP-200XLTHD**.

Table 8: Technical Specifications[1] of the VP-200XLTHD (with 30m CAT 5 cable)

INPUT:	1 XGA on a 15-pin HD connector
OUTPUTS:	1 XGA on a 15-pin HD connector; 1 RJ-45 connector
MAX. OUTPUT LEVEL[2]:	2.4Vpp (XGA), 1.5Vpp (CAT 5)
BANDWIDTH (-3dB):	405MHz (XGA)
RESOLUTION:	Up to UXGA, up to 1080p
DIFF. GAIN[2]:	0.03% (XGA), 3.3% (CAT 5)
DIFF. PHASE[2]:	0.03Deg (XGA), 0.3Deg (CAT 5)
K-FACTOR[2]:	<0.02% (XGA and CAT 5)
S/N RATIO[2]:	78dB (XGA), 71dB (CAT 5)
CONTROLS[2]:	XGA: LEVEL: –1.6dB to +1.9dB; EQ.: 0 to 4dB @50MHz
COUPLING[2]:	DC (XGA), AC (CAT 5)
POWER SOURCE:	12V DC, 105mA
DIMENSIONS:	12cm x 7.5cm x 2.5cm (4.7" x 2.95" x 0.98") W, D, H
WEIGHT:	0.3kg (0.67lb) approx.
ACCESSORIES:	Power supply

1 Specifications are subject to change without notice

2 For the VP-200XLTHD to TP-120 SETUP

Table 9 lists the technical specifications of the **VP-5THD**.

Table 9: Technical Specifications of the VP-5THD (with 60m CAT 5 cable)

INPUT:	1 XGA on a 15-pin HD connector
OUTPUTS:	4 XGA on 15-pin HD connectors 1 RJ-45 connector
MAX. OUTPUT LEVEL[1]:	1.7Vpp (XGA), 1.7Vpp (CAT 5)
BANDWIDTH (-3dB):	445MHz (XGA), 154MHz (CAT 5)
RESOLUTION:	Up to UXGA, up to 1080p[2]
DIFF. GAIN[1]:	0.8% (XGA), 3.2% (CAT 5)
DIFF. PHASE[1]:	0.08Deg (XGA), 0.06Deg (CAT 5)
K-FACTOR[1]:	0.1% (XGA), <0.05% (CAT 5)
S/N RATIO[1]:	76dB (XGA), 73dB (CAT 5)
CONTROLS[1]:	LEVEL: –7.4dB to 3.5dB (CAT 5) EQ.: 0 to 37.8dB @50MHz (CAT 5)
COUPLING[1]:	DC (XGA), AC (CAT 5)
POWER SOURCE:	230 VAC, 50/60 Hz. (115VAC, U.S.A.) 13VA
DIMENSIONS:	22cm x 18cm x 4.5cm (8.7" x 7" x 1.7") W, D, H (half 19", 1U)
WEIGHT:	1.2kg (2.6 lbs) approx.
ACCESSORIES:	Power cord

Table 10 lists the technical specifications of the **VP-5R**.

Table 10: Technical Specifications of the VP-5R (with 30m CAT 5 cable)

INPUT:	1 RJ-45 connector
OUTPUTS:	5 XGA on 15-pin HD connectors
MAX. OUTPUT LEVEL[3]:	1.4Vpp
BANDWIDTH (-3dB):	150MHz
DIFF. GAIN[3]:	3.4%
DIFF. PHASE[3]:	0.05Deg
K-FACTOR[3]:	<0.05%
S/N RATIO[3]:	74dB
CONTROLS[3]:	LEVEL: –8.2dB to 4.3dB LINE EQ.: 0 to 30dB; OUT EQ.: 0 to 8.6dB
COUPLING[3]:	AC
POWER SOURCE:	230V AC, 50/60 Hz. (115V AC, U.S.A.) 9.2VA
DIMENSIONS:	22cm x 18cm x 4.5cm (8.7" x 7" x 1.7") W, D, H (half 19", 1U)
WEIGHT:	1.2kg (2.6 lbs) approx.
ACCESSORIES:	Power cord

1 For the VP-5THD to TP-120 SETUP

2 The HD resolutions apply to the HD version of the unit

3 For the VP-5R to WP-110 SETUP

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)

For the latest information on our products and a list of Kramer distributors visit 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.
Web site: www.kramerelectronics.com
E-mail: info@kramerel.com
P/N: 2900-000635 REV 1