



KRAMER ELECTRONICS LTD.

# USER MANUAL

MODELS:

**PT-580T**

HDMI Line Transmitter

**TP-580T**

HDMI Line Transmitter

**TP-580R**

HDMI Line Receiver

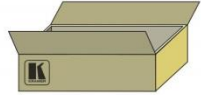


## PT-580T, TP-580T and TP-580R Quick Start Guide

This guide helps you install and use your product for the first time. For more detailed information, go to <http://www.kramerav.com/manual/PT-580T> to download the latest manual or scan the QR code on the left.

### Step 1: Check what's in the box

- The **PT-580T** HDMI Line Transmitter or **TP-580T** HDMI Line Transmitter or the **TP-580R** HDMI Line Receiver
- 1 Power adapter (12V DC input for **TP-580T/R** and 5V DC for **PT-580T**)
- Mounting Brackets
- 4 Rubber feet
- 1 Quick start guide



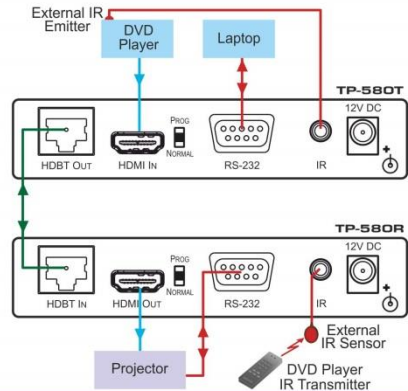
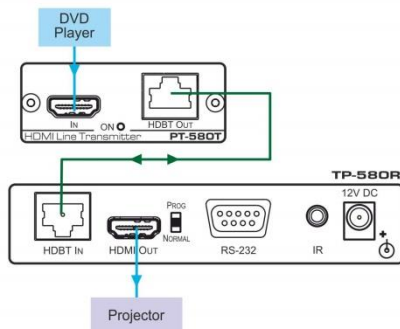
Save the original box and packaging materials in case you need to return your product for service.

### Step 2: Install the PT-580, TP-580T, TP-580R

Mount the devices in racks using the optional **RK-T2B** rack adapter for **TP-580T** and **TP-580R** and the optional **RK-1T2PT** rack adapter for **PT-580T** (available for purchase) or place them on shelves.

### Step 3: Connect the inputs and outputs

After mounting the units, connect the inputs and outputs. Always switch OFF the power on each device before connecting it to your **PT-580T/TP-580T** and **TP-580R**.



#### Twisted Pair Pinout

For the HDBaseT connectors, see the wiring diagram below



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

For best results, we recommend that you always use Kramer high-performance cables to connect AV equipment to the **PT-580T/TP-580T** and **TP-580R**. For optimum range and performance use Kramer's **BC-HDKat6a** cable. Note that the transmission range depends on the signal resolution, graphics card and display used. The distance using non-Kramer CAT 6 cable may not reach these ranges. Use only shielded cable where both ends of the shield are soldered to ground.

### Step 4: Connect the power

Connect the power adapters to the **PT-580T/TP-580T** and **TP-580R** and plug the adapter/s into the mains electricity.

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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 video, audio, presentation, and broadcasting professionals 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 14 groups that are clearly defined by function: GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Routers; 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 Video Products; GROUP 12: Digital Signage; GROUP 13: Audio; and GROUP 14: Collaboration.

Congratulations on purchasing your Kramer **PT-580T** or **TP-580T** or **TP-580R** transmitter/receiver pair, which is ideal for the following typical applications:

- Projection systems in conference rooms, boardrooms, auditoriums, hotels and churches, production studios
- Rental and staging



Note that **PT-580T**, **TP-580T** and **TP-580R** are purchased separately, and can be connected to other HDBaseT certified transmitters and receivers, respectively.

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## 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



Go to [www.kramerav.com/downloads/PT-580T](http://www.kramerav.com/downloads/PT-580T) to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

### 2.1 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables (we recommend Kramer high-performance, high-resolution cables) to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Do not secure the cables in tight bundles or roll the slack into tight coils
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality
- Position your Kramer **PT-580T**, **TP-580T** and **TP-580R** transmitter/receiver pair away from moisture, excessive sunlight and dust



This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.

### 2.2 Safety Instructions



**Caution:** There are no operator serviceable parts inside the unit

**Warning:** Use only the Kramer Electronics input power wall adapter that is provided with the unit

**Warning:** Disconnect the power and unplug the unit from the wall before installing

## 2.3 Recycling Kramer Products

The Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring it to be collected and recycled. To comply with the WEEE Directive, Kramer Electronics has made arrangements with the European Advanced Recycling Network (EARN) and will cover any costs of treatment, recycling and recovery of waste Kramer Electronics branded equipment on arrival at the EARN facility. For details of Kramer's recycling arrangements in your particular country go to our recycling pages at <http://www.kramerAV.com/support/recycling/>.

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## 3 Overview

This section describes the **PT-580**, **TP-580T** and **TP-580R** features.

### 3.1 TP-580T and TP-580R Overview

The **TP-580T** and **TP-580R** are a high-performance, HDBaseT technology twisted pair transmitter and receiver for HDMI, bidirectional RS-232 and IR signals. The **TP-580T** converts the HDMI signal, RS-232 and IR input signals to a twisted pair signal. The **TP-580R** converts the twisted pair signal back into HDMI, RS-232, and IR signals.

The **TP-580T** and the **TP-580R** can form a transmission and reception system either together or each device separately with another certified HDBaseT device. For example, the transmitter and receiver system can be composed of the **TP-580T** that connects to the Kramer **TP-580R** to form a transmitter receiver pair.

The **TP-580T** transmitter and **TP-580R** receiver feature:

- A bandwidth of up to 10.2Gbps (3.4Gbps per graphic channel), supporting 4K resolution
- A range of 70m (230ft) at 2K, 40m (130ft) at 4K UHD resolutions



For optimum range and performance using HDBaseT™, use Kramer's **BC-HDKat6a** cable. Note that the transmission range depends on the signal resolution, source and display used. The distance using non-Kramer CAT 6 cable may not reach these ranges.

- HDBaseT™ technology
- HDTV compatibility and HDCP compliance
- HDMI support - HDMI (deep color, x.v.Color™, lip sync, HDMI uncompressed audio channels, Dolby TrueHD, DTS-HD, CEC, 2k, 4k, 3D)
- EDID pass through, passes EDID/HDCP signals from the source to the display
- Bidirectional RS-232 interface - commands and data can flow in both directions via the RS-232 interface, allowing status requests and control of the destination unit



- Bidirectional infrared interface for remote control of peripheral devices (see [Section 4.1](#))
- LED status indicators for input selection, output, link and power
- Compact DigiTOOLS® enclosures, and these can be rack mounted side-by-side in a 1U rack space with the optional **RK-3T**, **RK-6T** or **RK-9T** universal rack adapters

## 3.2 PT-580T Overview

The **PT-580T** is a high-performance, HDBaseT technology Twisted Pair transmitter for HDMI signals and converts it to a twisted pair signal. An HDBaseT receiver (for example the **TP-580R** or **WP-580R**) converts the twisted pair signal back into an HDMI signal and together they form a transmitter receiver pair.

The **PT-580T** transmitter features:

- A bandwidth of up to 10.2Gbps (3.4Gbps per graphic channel), supporting 4K resolution
- A range of up to 70 meters (230 feet)
- HDBaseT technology
- HDTV compatibility and HDCP compliance
- HDMI support - HDMI (deep color, x.v.Color™, lip sync, HDMI uncompressed audio channels, Dolby TrueHD, DTS-HD, CEC, 2k, 4k, 3D)
- EDID pass-through - passes EDID signals from the source to the display
- LED status indicator for power
- Ultra-Compact PicoTOOLS™ – 4 units can be rack mounted side-by-side in a 1U rack space with the optional **RK-4PT** rack adapter



For optimum range and performance using HDBaseT™, use Kramer's **BC-HDKat6a** cable. Note that the transmission range depends on the signal resolution, source and display used. The distance using non-Kramer CAT 6 cable may not reach these ranges.

### 3.3 About HDBaseT™ Technology

HDBaseT™ is an advanced all-in-one connectivity technology (supported by the HDBaseT Alliance). It is particularly suitable in the consumer home environment as a digital home networking alternative where it enables you to replace numerous cables and connectors by a single LAN cable used to transmit, for example, uncompressed full high-definition video, audio, IR, as well as various control signals.



The products described in this user manual are HDBaseT certified.

### 3.4 Using Twisted Pair Cable

Kramer engineers have developed special twisted pair cables to best match our digital twisted pair products; the Kramer **BC-HDKat6a** (CAT 6 23 AWG cable) significantly outperforms regular CAT 5 / CAT 6 cables.



We strongly recommend that you use shielded twisted pair cable.

### 3.5 Defining the TP-580T HDMI Line Transmitter

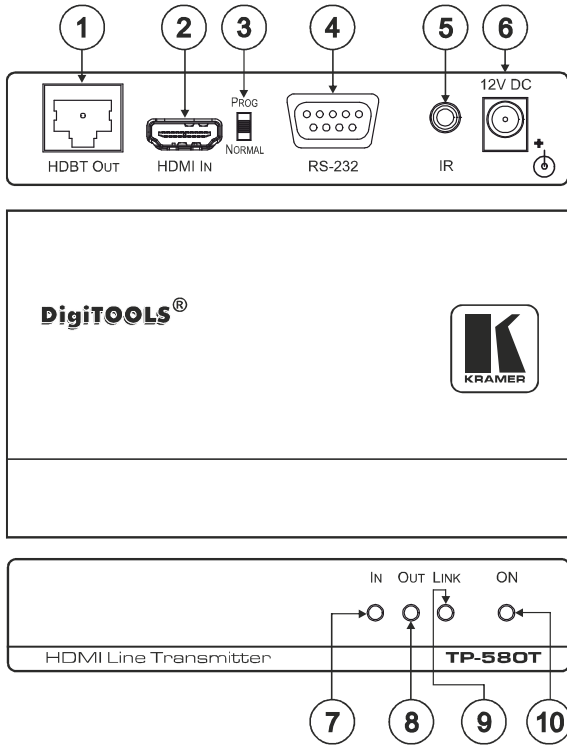


Figure 1: TP-580T HDMI Line Transmitter

#	Feature	Function
1	HDBT OUT RJ-45 Connector	Connects to the HDBT IN RJ-45 connector on the TP-580R
2	HDMI IN Connector	Connects to the HDMI source
3	PROG/NORMAL Switch	Slide to PROG to upgrade to the latest Kramer firmware via RS-232, or slide to NORMAL for normal operation
4	RS-232 9-pin D-sub Connector	Connects to an RS-232 port for firmware upgrade and control of the destination unit
5	IR 3.5mm Mini Jack Connector	Connects to an external infrared transmitter / sensor (receiver)
6	12V DC	+12V DC connector for powering the unit
7	IN LED	Lights green when an HDMI input device is connected
8	OUT LED	Lights green when an HDMI output device is detected
9	LINK LED	Lights green when the TP connection is active
10	ON LED	Lights when receiving power

### 3.6 Defining the TP-580R HDMI Line Receiver

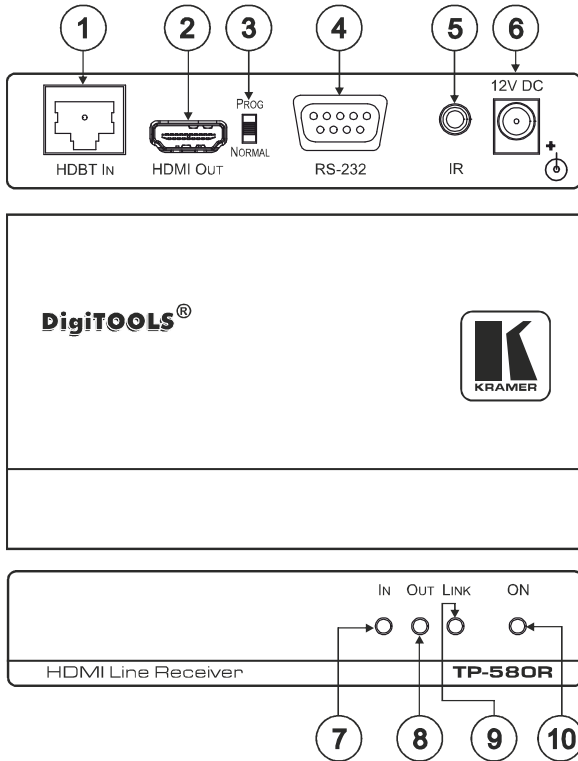


Figure 2: TP-580R HDMI Line Receiver

#	Feature	Function
1	HDBT IN RJ-45 Connector	Connects to the HDBT OUT RJ-45 connector on the TP-580T
2	HDMI OUT Connector	Connects to the HDMI acceptor
3	PROG/NORMAL Button	Slide to PROG to upgrade to the latest Kramer firmware via RS-232, or slide to NORMAL for normal operation
4	RS-232 9-pin D-sub Connector	Connects to an RS-232 port for firmware upgrade and control of the destination unit
5	IR 3.5mm Mini Jack Connector	Connects to an external infrared transmitter / sensor (receiver)
6	12V DC	+12V DC connector for powering the unit
7	IN LED	Lights green when an HDMI input device is connected
8	OUT LED	Lights green when an HDMI output device is detected
9	LINK LED	Lights green when the TP connection is active
10	ON LED	Lights green when receiving power

### 3.7 Defining the PT-580T

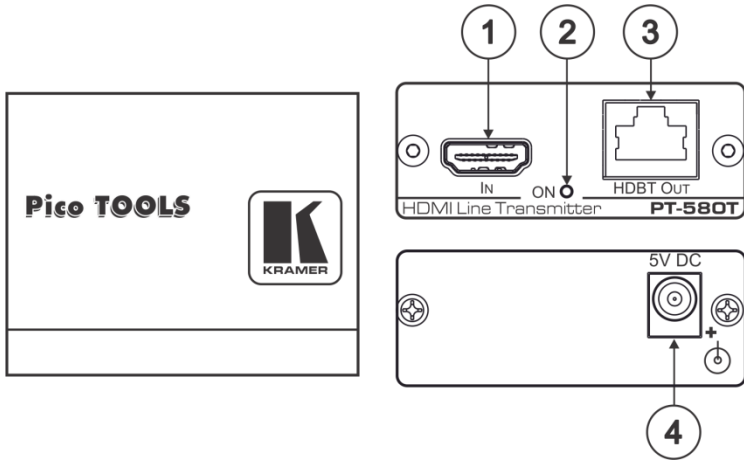


Figure 3: PT-580T HDMI Line Transmitter

#	Feature	Function
1	IN HDMI Connector	Connects to the HDMI source
2	ON LED	Lights when receiving power
3	HDBT OUT RJ-45 Connector	Connects to the HDBT IN RJ-45 connector on the TP-580R
4	5V DC	+5V DC connector for powering the unit



Note that [Section 5](#) shows how to connect the **PT-580T**.

### 3.8 Connecting via RS-232

[Figure 4](#) defines the RS-232 pinout.

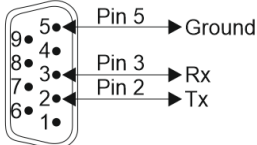


Figure 4: RS-232 Pinout

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## 4 Connecting the TP-580T and TP-580R



Always switch off the power to each device before connecting it to your Transmitter and Receiver. After connecting your Transmitter and Receiver, connect their power and then switch on the power to each device.

You can use the **TP-580T HDMI Line Transmitter** and the **TP-580R HDMI Line Receiver** to configure an HDMI transmitter/receiver system, as shown in the example in [Figure 5](#).

To connect the **TP-580T**, connect the:

1. HDMI source (for example, a DVD player) to the HDMI IN connector.
2. RS-232 9-pin D-sub connector to a computer (for example, a laptop to control the projector).
3. IR 3.5mm mini jack to an IR emitter.
4. HDBT OUT RJ-45 connector over twisted pair to the **TP-580R HDBT IN** connector.

Alternatively, you can use any other certified HDBaseT receiver device (for example, the Kramer **WP-580R**)

5. 12V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in [Figure 5](#)).

To connect the **TP-580R**, connect the:

6. HDMI OUT connector to the HDMI acceptor (for example, a projector).
7. RS-232 9-pin D-sub connector to an RS-232 port (for example, a projector that is controlled by the laptop connected to **TP-580T**).
8. IR 3.5mm mini jack to an IR sensor.
9. HDBT IN RJ-45 connector over twisted pair to the **TP-580T HDBT OUT** connector.

Alternatively, you can use any other certified HDBaseT transmitter device (for example, the Kramer **WP-580T**)

10. 12V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in [Figure 5](#)).

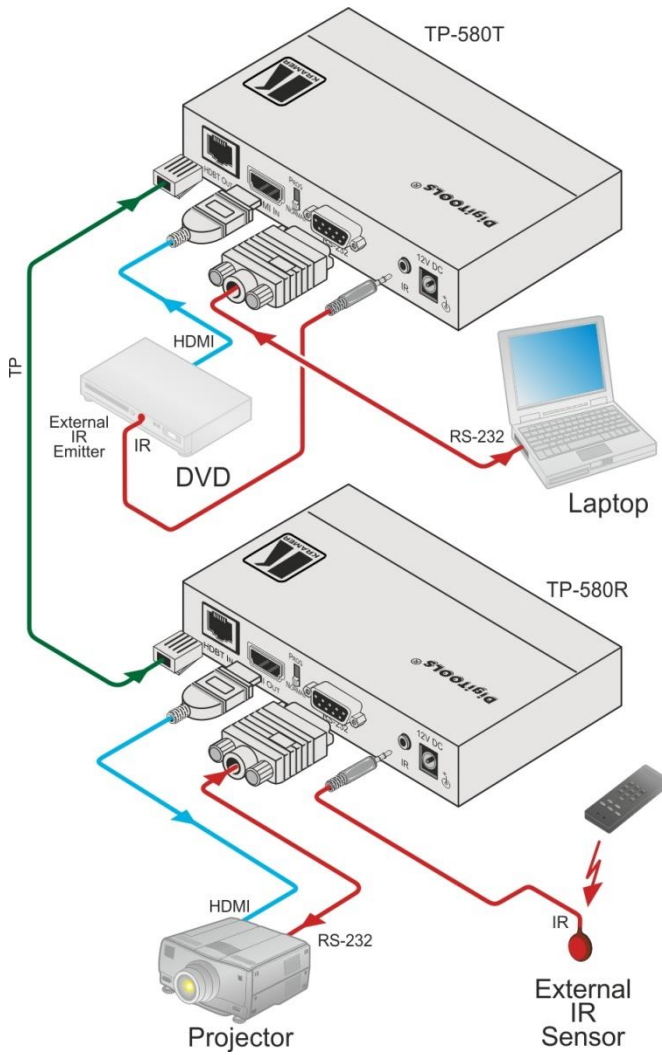


Figure 5: Connecting the TP-580T/TP-580R Transmitter/Receiver Pair

## 4.1 Controlling the A/V Equipment via an IR Transmitter

Since the IR signal on the **TP-580T/TP-580R** transmitter/receiver pair is bidirectional, you can use a remote control transmitter (that is used for controlling a peripheral device, for example, a DVD player) to send commands (to the A/V equipment) from either end of the transmitter /receiver system. To do so, you have to use the Kramer external IR sensor on one end (P/N: 95-0104050) and the Kramer IR emitter cable on the other end (P/N: C-A35/IRE-10)

Two IR Emitter Extension Cables are also available: a 15 meter cable and a 20 meter cable.

The example in [Figure 6](#) illustrates how to control the DVD player that is connected to **TP-580T** using a remote control, via the **TP-580R**. In this example, the External IR Sensor is connected to the IR connector of the **TP-580R** and an IR Emitter is connected between the **TP-580T** and the DVD player. The DVD remote control sends a command while pointing towards the External IR Sensor. The IR signal passes through the TP cable and the IR Emitter to the DVD player, which responds to the command sent.

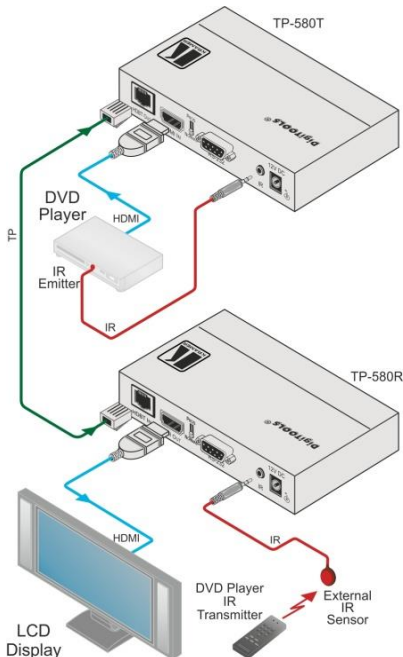


Figure 6: Controlling a DVD Player via the TP-580R



The example in [Figure 7](#) illustrates how to control the LCD display that is connected to **TP-580R** using a remote control, via the **TP-580T**. In this example, the External IR Sensor is connected to the IR connector of the **TP-580T** and an IR Emitter is connected between the **TP-580R** and the LCD display. The LCD display remote control sends a command while pointing towards the External IR Sensor. The IR signal passes through the TP cable and the IR Emitter to the LCD display, which responds to the command sent.

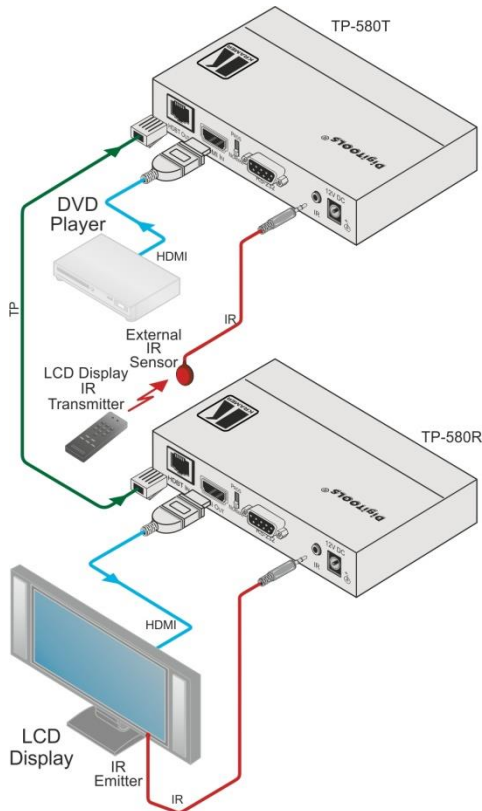


Figure 7: Controlling an LCD Display via the TP-580T

## 4.2 Connecting to a PC

You can connect to the transmitter/receiver system via an RS-232 connection using, for example, a PC. Note that a null-modem adapter/connection is not required.

To connect a PC via RS-232, connect the RS-232 9-pin D-sub rear panel port on the transmitter/receiver system unit via a 9-wire straight cable (only pin 2 to pin 2, pin 3 to pin 3, and pin 5 to pin 5 need to be connected) to the RS-232 9-pin D-sub port on your PC.

[Figure 8](#) shows RS-232 bidirectional control of the projector that is connected to **TP-580R**, via a PC connected to the **TP-580T**:

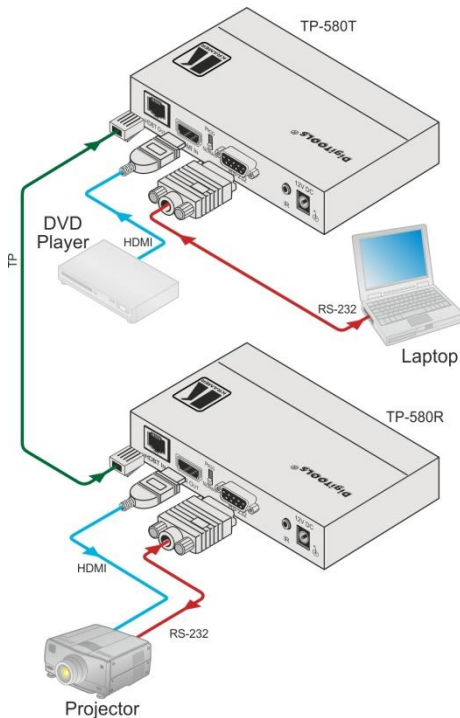


Figure 8: RS-232 Control

## 5 Connecting the PT-580T



Always switch off the power to each device before connecting it to your **PT-580T** and the receiver. After connecting your **PT-580T**/receiver, connect the power and then switch on the power to each device.

To connect the **PT-580T** to a receiver (for example, the **TP-580R**), as illustrated in the example in [Figure 9](#), do the following:

1. Connect an HDMI source (for example, a DVD player) to the HDMI IN connector.
2. Connect the HDBT OUT RJ-45 connector over twisted pair to the **TP-580R** *HDBT IN* connector.  
Alternatively, you can use any other certified HDBaseT receiver device (for example, the Kramer **WP-580R**)
3. On the **TP-580R**, connect the HDMI OUT connector to an HDMI acceptor (for example, a projector).
4. Connect the 5V DC power adapter to the power socket on the **PT-580T** and the 12V DC power adapter to the power socket on the **TP-580R** and connect the adapter to the mains electricity (not shown in [Figure 9](#)).

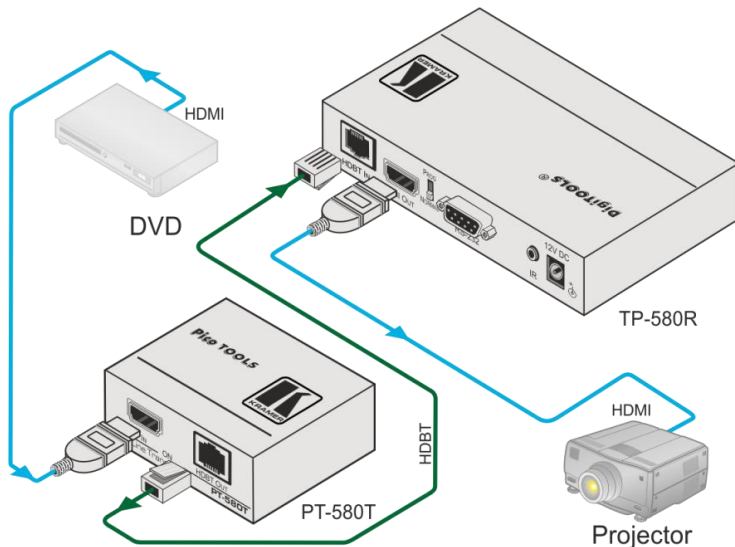


Figure 9: Connecting the PT-580T/TP-580R Transmitter/Receiver Pair

## 6 Wiring the RJ-45 Connectors

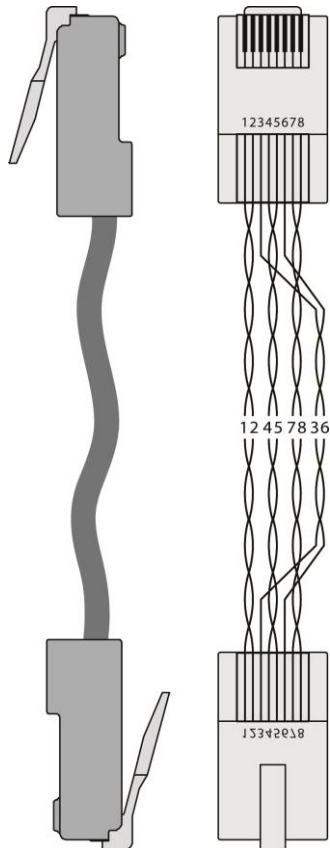
This section defines the TP pinout, using a **straight** pin-to-pin cable with RJ-45 connectors.



Note, that the cable Ground shielding must be connected / soldered to the connector shield.

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

Figure 10: TP PINOUT



## 7 Technical Specifications

	TP-580T	TP-580R
INPUTS:	1 HDMI connector	1 RJ-45 connector
OUTPUTS:	1 RJ-45 connector	1 HDMI connector
PORTS:	1 IR on a 3.5mm mini jack (for emitter or sensor) 1 RS-232 on a 9-pin D-sub connector	1 IR on a 3.5mm mini jack (for emitter or sensor) 1 RS-232 on a 9-pin D-sub connector
MAX. DATA RATE:	Up to 10.2Gbps (3.4Gbps per graphic channel)	
RANGE:	70m (230ft) at 2K, 40m (130ft) at 4K UHD resolutions	
RS-232 BAUD RATE:	115200	
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI and HDCP	
OPERATING TEMPERATURE:	0° to +40°C (32° to 104°F)	
STORAGE TEMPERATURE:	-40° to +70°C (-40° to 158°F)	
HUMIDITY:	10% to 90%, RHL non-condensing	
POWER CONSUMPTION:	12V DC, 275mA	12V DC, 430mA
DIMENSIONS:	12cm x 7.15cm x 2.44cm (4.7" x 2.8" x 1.0") W, D, H.	
WEIGHT:	0.2kg (0.44lbs)	
SHIPPING DIMENSIONS:	15.7cm x 12cm x 8.7cm (6.2" x 4.7" x 3.4") W, D, H.	
SHIPPING WEIGHT:	0.72kg (1.6lbs).	
INCLUDED ACCESSORIES:	2 Power supply units 12V/1.25A	
OPTIONS:	RK-3T 19" rack mount; Kramer external IR sensor (P/N: 95-0104050), Kramer IR emitter cable (P/N: C-A35/IRE-10); Kramer BC-HDKat6a cable	
Specifications are subject to change without notice Go to our Web site at <a href="http://www.kramerav.com">http://www.kramerav.com</a> to access the list of resolutions		

	PT-580T
INPUTS:	1 HDMI connector
OUTPUTS:	1 RJ-45 connector
BANDWIDTH:	Supports up to 3.4Gbps bandwidth per graphic channel
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI and HDCP
OPERATING TEMPERATURE:	0° to +40°C (32° to 104°F)
STORAGE TEMPERATURE:	-40° to +70°C (-40° to 158°F)
HUMIDITY:	10% to 90%, RHL non-condensing
POWER CONSUMPTION:	5V DC, 570mA
DIMENSIONS:	6.2cm x 5.2cm x 2.4cm (2.4" x 2.1" x 1") W, D, H
WEIGHT:	0.14kg (0.3lbs)
SHIPPING DIMENSIONS:	15.7cm x 12cm x 8.7cm (6.2" x 4.7" x 3.4") W, D, H.
SHIPPING WEIGHT:	0.4kg (0.88lbs)
INCLUDED ACCESSORIES:	5V DC power supply
OPTIONS:	19" RK-4PT rack adapter; Kramer BC-HDKat6a cable
Specifications are subject to change without notice Go to our Web site at <a href="http://www.kramerav.com">http://www.kramerav.com</a> to access the list of resolutions	

## LIMITED WARRANTY

The warranty obligations of Kramer Electronics for this product are limited to the terms set forth below:

### What is Covered

This limited warranty covers defects in materials and workmanship in this product.

### What is Not Covered

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Kramer Electronics to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover cartons, equipment enclosures, cables or accessories used in conjunction with this product.

Without limiting any other exclusion herein, Kramer Electronics does not warrant that the product covered hereby, including, without limitation, the technology and/or integrated circuit(s) included in the product, will not become obsolete or that such items are or will remain compatible with any other product or technology with which the product may be used.

### How Long Does this Coverage Last

Seven years as of this printing; please check our Web site for the most current and accurate warranty information.

### Who is Covered

Only the original purchaser of this product is covered under this limited warranty. This limited warranty is not transferable to subsequent purchasers or owners of this product.

### What Kramer Electronics will do

Kramer Electronics will, at its sole option, provide one of the following three remedies to whatever extent it shall deem necessary to satisfy a proper claim under this limited warranty:

1. Elect to repair or facilitate the repair of any defective parts within a reasonable period of time, free of any charge for the necessary parts and labor to complete the repair and restore this product to its proper operating condition. Kramer Electronics will also pay the shipping costs necessary to return this product once the repair is complete.
2. Replace this product with a direct replacement or with a similar product deemed by Kramer Electronics to perform substantially the same function as the original product.
3. Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

### What Kramer Electronics will not do Under This Limited Warranty

If this product is returned to Kramer Electronics or the authorized dealer from which it was purchased or any other party authorized to repair Kramer Electronics products, this product must be insured during shipment, with the insurance and shipping charges prepaid by you. If this product is returned uninsured, you assume all risks of loss or damage during shipment. Kramer Electronics will not be responsible for any costs related to the removal or re-installation of this product from or into any installation. Kramer Electronics will not be responsible for any costs related to any setting up this product, any adjustment of user controls or any programming required for a specific installation of this product.

### How to Obtain a Remedy under this Limited Warranty

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**SAFETY WARNING**

Disconnect the unit from the power supply before opening and servicing



P/N: 2900-300340



Rev: 4