

USER MANUAL

MODEL:

WP-789T, WP-789R, TP-789R, TP-789Rxr
HDMI Line Transmitters and Receivers over HDBaseT



Contents

Introduction	1
Getting Started	1
Overview	2
Typical Applications	3
Defining WP-789T, WP-789R, TP-789R, TP-789Rxr HDMI Line Transmitters and Receivers over HDBaseT	4
Mounting	7
Mounting TP-789R, TP-789Rxr	7
Mounting WP-789T	8
Mounting WP-789R	9
Connecting WP-789T, WP-789R, TP-789R, TP-789Rxr	11
Connecting WP-789T to TP-789R/TP-789Rxr	11
Connecting WP-789R to TP-789T	12
Connecting TP-789R/TP-789Rxr to WP-20	13
Connecting TP-789R/TP-789Rxr as PoE Acceptor	14
Connecting to Device via RS-232	16
Grounding WP-789T, WP-789R (Optional)	16
Connecting to WP-789T, WP-789R IR Terminal Block	17
Configuring WP-789T, WP-789R, TP-789R, TP-789Rxr	19
Setting DIP-Switches	19
Setting IR Frequency	20
Setting HDBaseT Range Mode for TP-789Rxr	20
Upgrading Firmware	20
Technical Specifications	21
WP-789T Technical Specifications	21
WP-789R Technical Specifications	22
TP-789R/TP-789Rxr Technical Specifications	23

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!

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/TP-789Rxr to check for up-to-date user manuals, application programs, and to check if firmware upgrades are available (where appropriate).

Achieving 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 **WP-789T**, **WP-789R**, **TP-789R**, **TP-789Rxr** away from moisture, excessive sunlight and dust.

Safety Instructions



Caution:

- This equipment is to be used only inside a building. It may only be connected to other equipment that is installed inside a building.
- For products with relay terminals and GPIO ports, please refer to the permitted rating for an external connection, located next to the terminal or in the User Manual.
- There are no operator serviceable parts inside the unit.



Warning:

- Use only the power cord that is supplied with the unit.
- To ensure continuous risk protection, replace fuses only according to the rating specified on the product label which located on the bottom of the unit.

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 www.kramerav.com/support/recycling.

Overview

Congratulations on purchasing your Kramer **WP-789T, WP-789R, TP-789R, TP-789Rxr** HDMI Line Transmitters and Receivers over HDBaseT.

WP-789T, WP-789R, TP-789R, TP-789Rxr are high-performance, long-reach (**WP-789T, WP-789R, TP-789R**) and extended-reach (**TP-789Rxr**) HDBaseT transmitters and receivers for 4K@60Hz (4:2:0) HDMI™, RS-232 and IR signals and powering over HDBaseT.

- High Performance Standard Extenders – Professional HDBaseT extenders for providing long-reach or extended-reach signals and powering over twisted-pair copper infrastructures. The extenders are standard and can be connected to any market-available HDBaseT-compliant extension product.



For optimum extension reach and performance, use recommended Kramer cables.

- PoE (Power over Ethernet) – Auto-senses the extension line PoE status and either provides power (**TP-789R, TP-789Rxr** only) to a remote PoE acceptor such as a PoE wall-plate, or accepts power (all models) from a remote PoE provider such as a PoE matrix.
- HDMI Signal Extension – Supports deep color, x.v.Color™, lip sync, HDMI uncompressed audio channels, Dolby TrueHD, DTS-HD, 2K, 4K, and 3D as specified in HDMI 2.0. EDID and CEC signals are passed through between the source and the display.
- I-EDIDPro™ Kramer Intelligent EDID Processing™ – Intelligent EDID pass-through algorithm that ensures plug & play operation for HDMI source and display systems.
- Multi-channel Audio Extension – Up to 32 channels of digital stereo uncompressed signals for supporting studio-grade surround sound.
- Ethernet Extension (**TP-789Rxr** only) – Ethernet interface data flows in both directions, allowing extension of up to 100Mbps Ethernet connectivity for LAN communication and device control.
- Bidirectional RS-232 Extension – Serial interface data flows in both directions, allowing data transmission and device control.
- Bidirectional Infrared Extension – IR interface data flows in both directions, allowing remote control of peripheral devices located at either end of the HDBaseT extension.

- **Cost-Effective Maintenance** – Status LED indicators facilitate easy local maintenance and troubleshooting. Local firmware upgrade via RS-232 connection ensures lasting, field-proven deployment.
- **Easy Installation** – Single cable connectivity for both HDBaseT signals and power. **TP-789R** and **TP-789Rxr** are compact DigiTOOLS® fan-less enclosures for dropped-ceiling mounting, or side-by-side mounting of 3 units in a 1U rack space with the recommended rack adapter.
Wall-plates fit into standard US, EU and UK 1-gang (**WP-789T**) and 2-gang (**WP-789R**) in-wall box sizes, supporting decorative integration with room-deployed user interfaces such as electrical switches.

Typical Applications

WP-789T, WP-789R, TP-789R, TP-789Rxr are ideal for the following typical applications:

- Long-distance AV signal extension for multi-room, large dividable auditoriums and lecture hall connectivity.
- AV extension in conference rooms, boardrooms, control rooms, hotels and large church facilities.
- Elegant wall mounted TV installation with low-profile receiver connection.

Defining WP-789T, WP-789R, TP-789R, TP-789Rxr HDMI Line Transmitters and Receivers over HDBaseT

This section defines WP-789T, WP-789R, TP-789R, TP-789Rxr.

WP-789T

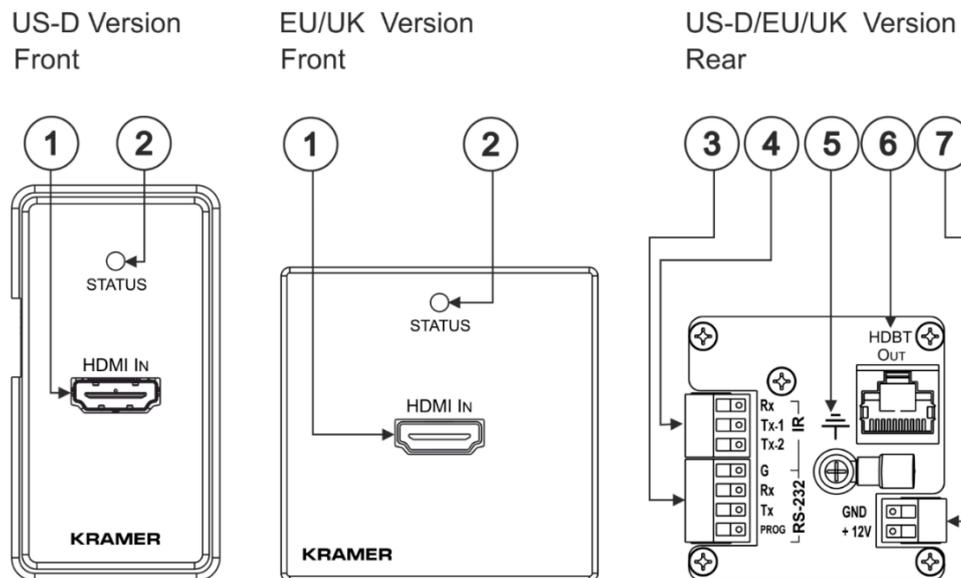


Figure 1: WP-789T

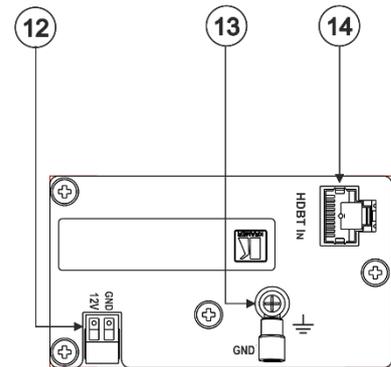
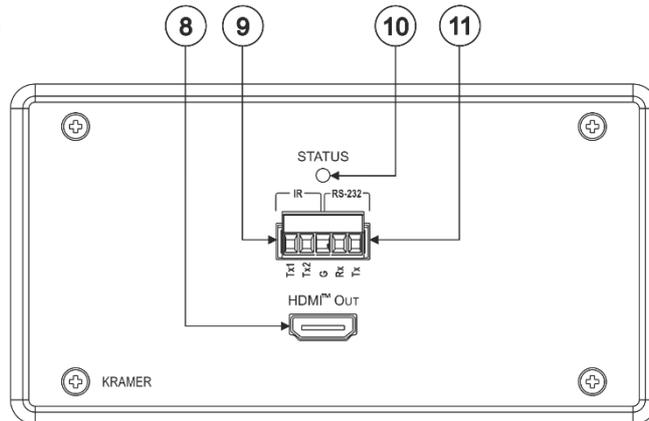
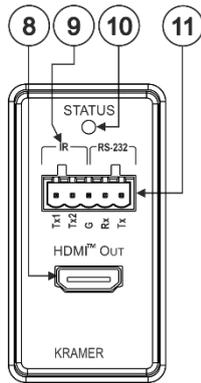
#	Feature	Function																				
①	HDMI™ IN Connector	Connects to an HDMI source.																				
②	STATUS LED	<table border="1"> <thead> <tr> <th>Color</th> <th>HDBaseT Connected</th> <th>Source Detected</th> <th>Acceptor Detected</th> </tr> </thead> <tbody> <tr> <td>Blue</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> </tr> <tr> <td>Green</td> <td>Yes</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>Yellow</td> <td>Yes</td> <td>No</td> <td>N/A</td> </tr> <tr> <td>White</td> <td colspan="3">Device is powered with no detected connections.</td> </tr> </tbody> </table> <p>STATUS LED is off only when the device does not receive power.</p>	Color	HDBaseT Connected	Source Detected	Acceptor Detected	Blue	Yes	Yes	Yes	Green	Yes	Yes	No	Yellow	Yes	No	N/A	White	Device is powered with no detected connections.		
Color	HDBaseT Connected	Source Detected	Acceptor Detected																			
Blue	Yes	Yes	Yes																			
Green	Yes	Yes	No																			
Yellow	Yes	No	N/A																			
White	Device is powered with no detected connections.																					
③	RS-232 (G, Rx, Tx, PROG) 4-pin Terminal Block	Connect to an RS-232 port for serial link extension to a receiver.																				
④	IR (Rx, Tx-1, Tx-2), 3-pin Terminal Blocks	Connect to an external IR infrared emitter or controller IR port.																				
⑤	Ring Tongue Terminal Grounding Screw	Connect to grounding wire (optional).																				
⑥	HDBT OUT RJ-45 Connector	Connect to the HDBT IN connector on a receiver (for example, TP-789R).																				
⑦	Power Supply 2-pin Terminal Block Connector	Connect to a power supply (if required). Connect GND to GND, +12V to +12V.																				

WP-789R

US-D Version
Front

EU/UK Version
Front

US-D/EU/UK Version
Rear



#	Feature	Function																				
8	HDMI™ OUT Connector	Connect to an HDMI acceptor.																				
9	IR (Tx1, Tx2) Output, 3-pin Terminal Block Connectors	Connect to an external IR emitter cable: Tx1, G: use for fixed 38kHz non-modulated IR signals. Tx2, G: use for 20-100kHz wide-range modulated IR signals.																				
10	STATUS LED	<table border="1"> <thead> <tr> <th>LED Color</th> <th>HDBT Connected</th> <th>Source Detected</th> <th>Acceptor Detected</th> </tr> </thead> <tbody> <tr> <td>Blue</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> </tr> <tr> <td>Green</td> <td>Yes</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>Yellow</td> <td>Yes</td> <td>No</td> <td>N/A</td> </tr> <tr> <td>White</td> <td colspan="3">Device is powered with no detected connections.</td> </tr> </tbody> </table>	LED Color	HDBT Connected	Source Detected	Acceptor Detected	Blue	Yes	Yes	Yes	Green	Yes	Yes	No	Yellow	Yes	No	N/A	White	Device is powered with no detected connections.		
		LED Color	HDBT Connected	Source Detected	Acceptor Detected																	
		Blue	Yes	Yes	Yes																	
		Green	Yes	Yes	No																	
		Yellow	Yes	No	N/A																	
White	Device is powered with no detected connections.																					
STATUS LED is off only when the device does not receive power.																						
11	RS-232 (G, Rx, Tx) 3-pin Terminal Block Connector	Connect to an RS-232 port.																				
12	Power Supply 2-pin Terminal Block Connector	Connect to a power supply (if required). Connect GND to GND, +12V to +12V.																				
13	Ring Tongue Terminal Grounding Screw	Connect to grounding wire (optional).																				
14	HDBT IN RJ-45 Connector	Connect to the HDBT OUT connector on a transmitter (for example, TP-780T).																				

TP-789R

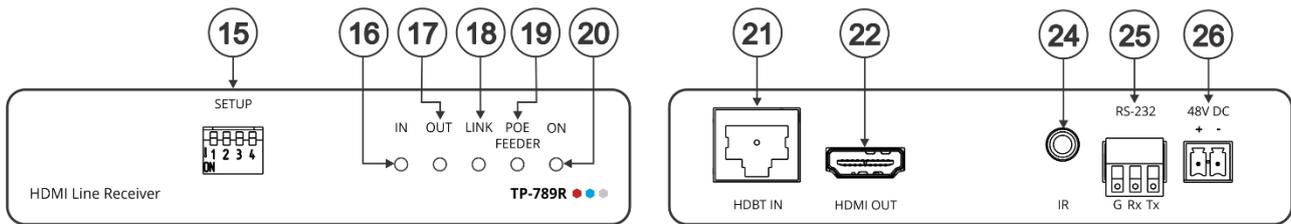


Figure 2: TP-789R

TP-789Rxr

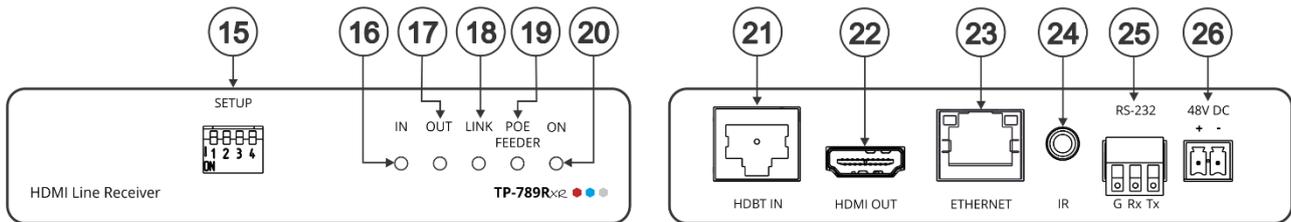


Figure 3: TP-789Rxr

#	Feature	Function
⑮	SETUP DIP-switches	Set the operation DIP-switches.
⑯	IN LED	Lights green when an active, far-end source device input signal is detected.
⑰	OUT LED	Lights green when an active sink (acceptor) output signal is detected on the local HDMI output.
⑱	LINK LED	Lights green when an HDBaseT link is established with the HDBaseT transmitter.
⑲	POE FEEDER LED	Lights green when the device is feeding PoE power to the HDBaseT connected transmitter.
⑳	ON LED	Lights green when the device receives power either from the power supply unit or by PoE.
㉑	HDBT IN RJ-45 Connector	Connect to the RJ-45 HDBT OUT connector on a transmitter (for example, WP-789T , WP-20 , TP-780Txr).
㉒	HDMI OUT Connector	Connect to an HDMI acceptor.
㉓	ETHERNET RJ-45 Connector	Connect to a LAN port for LAN extension to the transmitter.
㉔	IR 3.5mm Mini Jack Connector	Connect to an external infrared emitter / sensor.
㉕	RS-232 (G, Rx, Tx) 3-pin Terminal Block	Connects to an RS-232 port for serial link extension to a transmitter.
㉖	48V DC Power Terminal Block	If TP-789R , TP-789Rxr provides PoE, connect it to the Kramer power supply.  If it accepts PoE, no power connection is needed.

Mounting

This section provides instructions for mounting **WP-789T**, **WP-789R**, **TP-789R**, **TP-789Rxr**. Before installing, verify that the environment is within the recommended range:



- Operation 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.



- **WP-789T**, **WP-789R**, **TP-789R**, **TP-789Rxr** must be placed upright in the correct horizontal position.



Warning:

- Ensure that the environment (e.g., maximum ambient temperature & air flow) is compatible for the device.
- Avoid uneven mechanical loading.
- Appropriate consideration of equipment nameplate ratings should be used for avoiding overloading of the circuits.
- Reliable earthing of rack-mounted equipment should be maintained.

Mounting TP-789R, TP-789Rxr



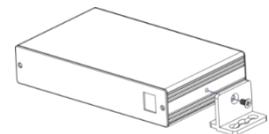
Mount device before connecting any cables or power.

To mount TP-789R, TP-789Rxr in a rack:

Mount the unit in a rack using the recommended rack adapter (see www.kramerav.com/product/TP-789Rxr)

To mount the TP-789R, TP-789Rxr on a table or shelf:

- Attach the rubber feet and place the unit on a flat surface.
- Fasten a bracket (included) on each side of the unit and attach it to a flat surface.



For more information go to www.kramerav.com/downloads/TP-789Rxr

Mounting WP-789T

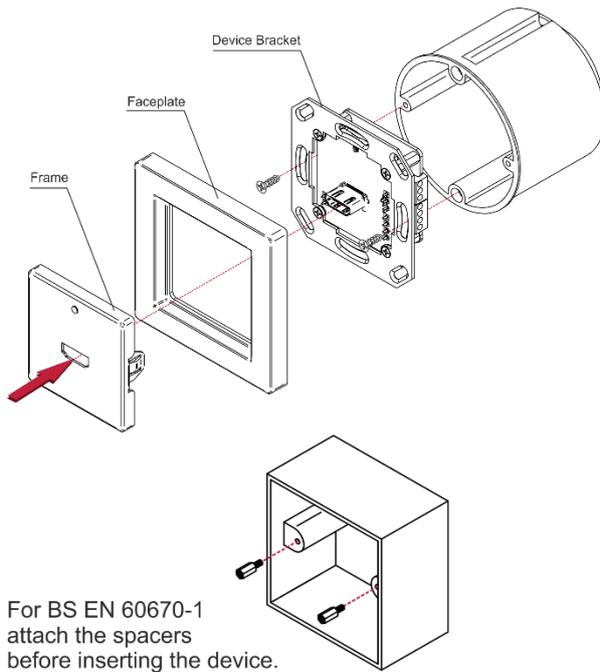


Before mounting, connect the HDBaseT cable and power

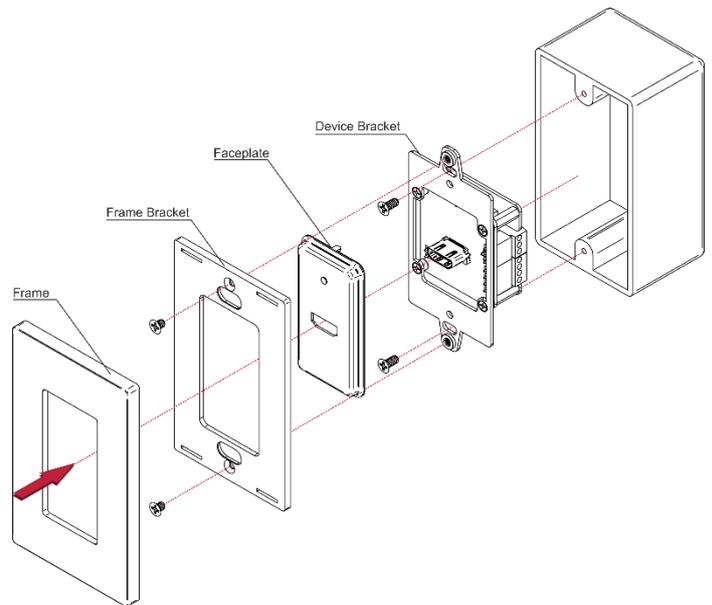
To mount WP-789T:

- Insert the device into the in-wall box and connect the parts as shown in the illustrations below:

EU/UK Version



US-D Version



DECORA® design frames are included in US-D models.

We recommend that you use any of the following standard 1 Gang in-wall junction boxes (or their equivalent):

- **US-D:** 1 Gang US electrical junction boxes.
- **EU:** 1 Gang in-wall junction box, with a cut-hole diameter of 68mm and depth that can fit in both the device and the connected cables (DIN 49073).
- **UK:** 1 Gang in-wall junction box, 75x75mm (W, H) and depth that can fit in both the device and the connected cables (BS 4662 or BS EN 60670-1 used with supplied spacers and screws).

Mounting WP-789R

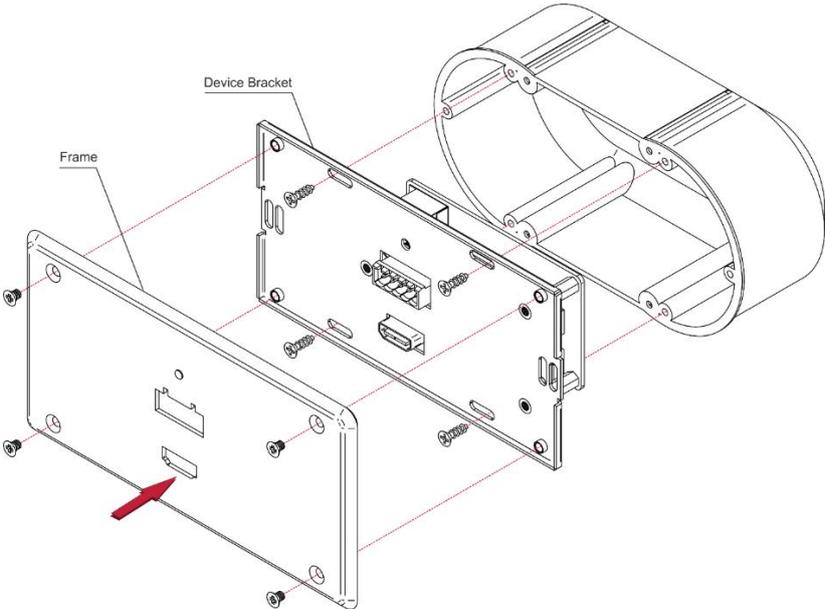


Before mounting, connect the HDBaseT cable and power

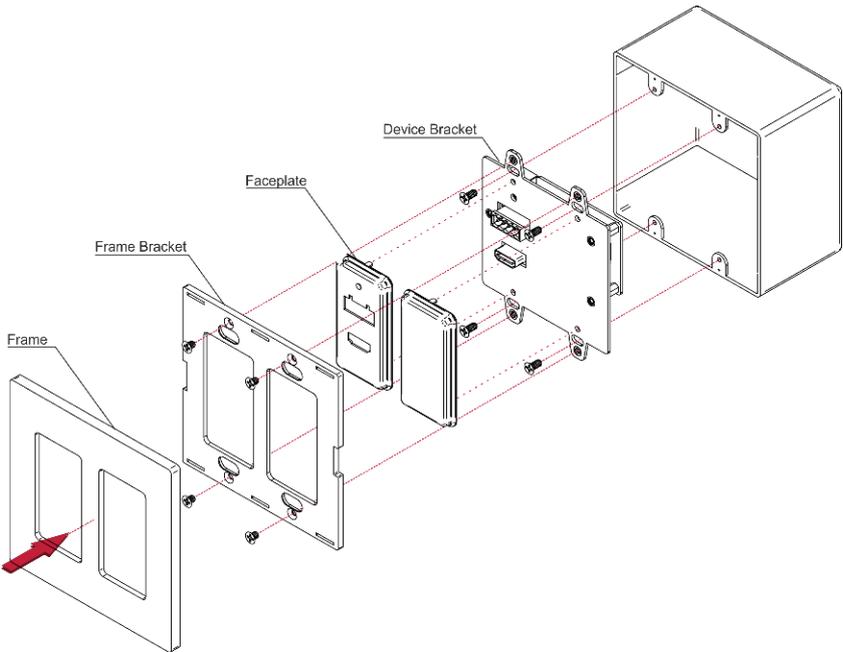
To mount WP-789R:

- Insert the device into the in-wall box and connect the parts as shown in the illustrations below:

EU/UK Version



US-D Version



DECORA® design frames are included in US-D models.

We recommend that you use any of the following standard 2 gang in-wall junction boxes (or their equivalent):

- **US-D:** 2 gang US electrical junction boxes.
- **EU:** 2 gang in-wall junction box, with a cut-hole diameter of 2x68mm and depth that can fit in both the device and the connected cables (DIN 49073).
- **UK:** 2 gang in-wall junction box (BS 4662), 135x75mm (W, H) and depth that can fit in both the device and the connected cables.
- **EU/UK:** 2 gang on-wall junction box (use the recommended Kramer on-wall box available at www.kramerav.com/product/WP-789R).

Connecting WP-789T, WP-789R, TP-789R, TP-789Rxr

i Always switch off the power to each device before connecting it to your WP-789T, WP-789R, TP-789R, TP-789Rxr. After connecting your WP-789T, WP-789R, TP-789R, TP-789Rxr, connect its power and then switch on the power to each device.

Connecting WP-789T to TP-789R/TP-789Rxr

In this connection illustration:

- TP-789R acts as a PoE provider, providing power to WP-789T.
- A controller is used to control the video acceptor via RS-232 control extension over HDBaseT.
- An IR remote is used to control the video source via IR control extension over HDBaseT.

i For illustrative purposes, the figure below shows TP-789R, but the same connections apply to TP-789Rxr, with the addition of an Ethernet connector.

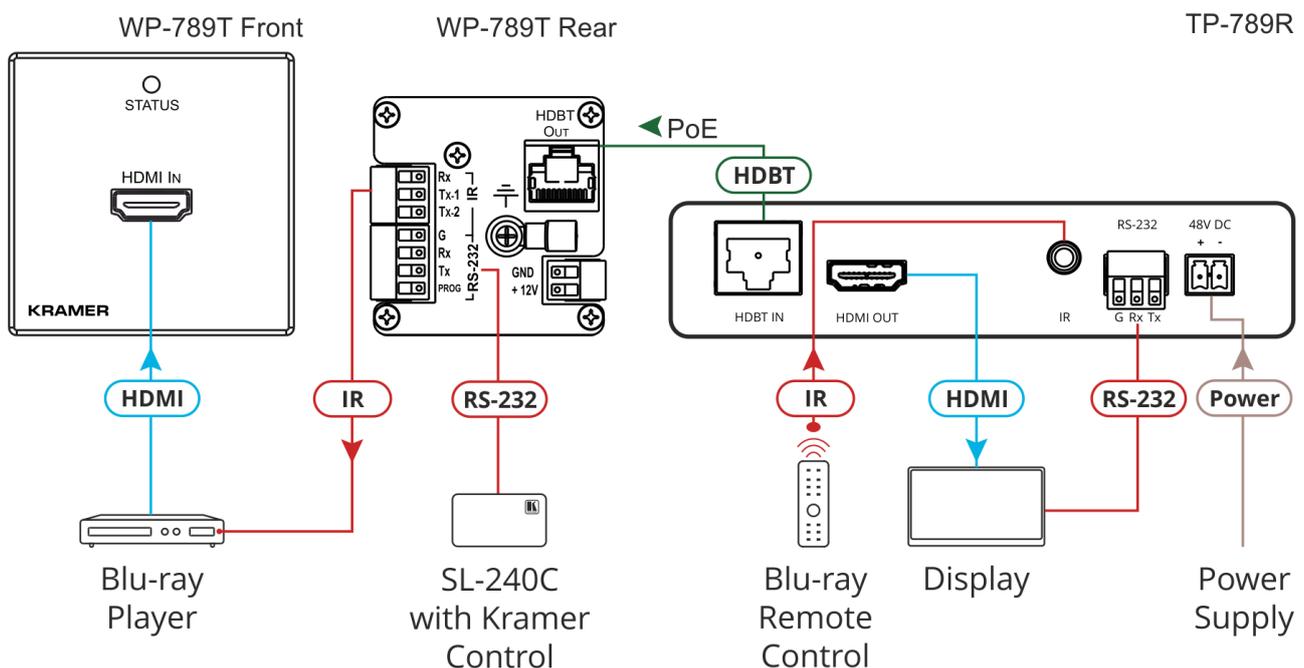


Figure 4: Connecting WP-789T to TP-789R

To connect WP-789T, TP-789R, TP-789Rxr as illustrated in the example in [\(Figure 4\)](#):

1. Connect the HDMI IN Connector **(1)** on the WP-789T front panel to the HDMI source (for example, a Blu-ray player).
2. Connect the IR Terminal Block Connector **(4)** on the WP-789T rear panel to the HDMI source via an IR emitter cable.

3. Connect the HDMI OUT Connector (22) on the TP-789R/TP-789Rxr rear panel to the HDMI acceptor (for example, a display).
4. Connect RS-232 Terminal Block Connector (25) on the TP-789R/TP-789Rxr rear panel to the HDMI acceptor.
5. Connect an IR sensor cable to the IR 3.5mm Mini Jack Connector (24) on the TP-789R/TP-789Rxr rear panel.
6. Connect an RS-232 controller (for example, SL-240C) to the RS-232 Terminal Block Connector (3) on the WP-789T rear panel.
7. Connect the HDBT OUT RJ-45 Connector (6) on the WP-789T rear panel to the HDBT IN RJ-45 Connector (21) on the TP-789R/TP-789Rxr rear panel.
8. Connect the power adapter to the 48V DC Power Terminal Block (26) on TP-789R/TP-789Rxr rear panel (not shown in [Figure 4](#)) and to the mains electricity.

Connecting WP-789R to TP-780T

In this connection illustration:

- TP-780T acts as a PoE provider, providing power to WP-789R.
- A controller is used to control the video acceptor via RS-232 control extension over HDBaseT.
- An IR remote is used to control the video display via IR control extension over HDBaseT.

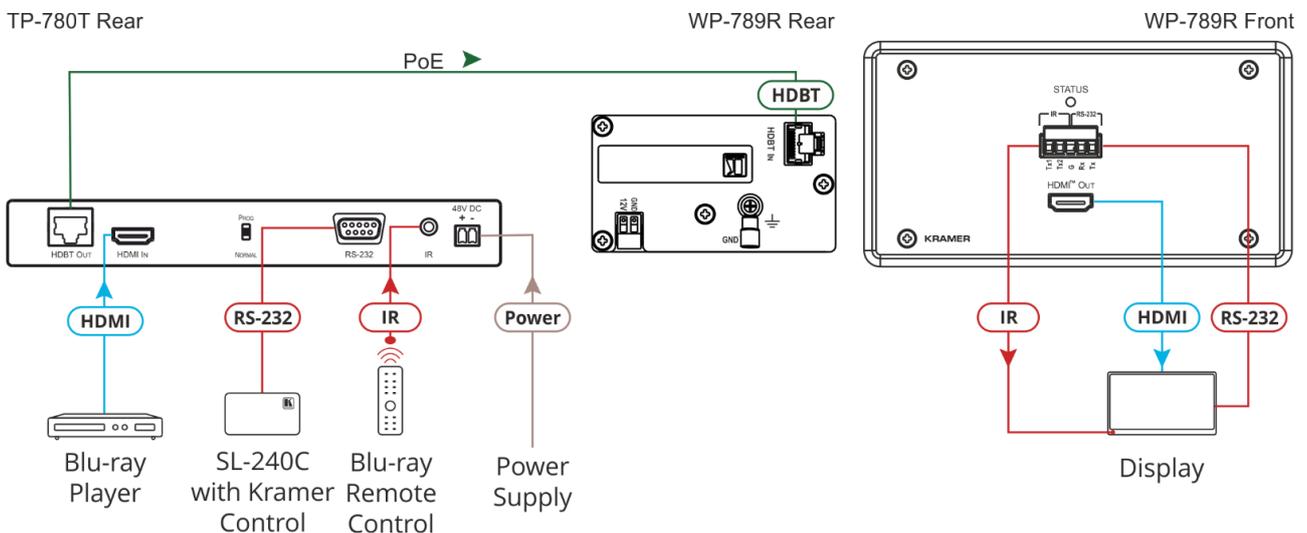


Figure 5: Connecting WP-789R to TP-780T

To connect WP-789R to TP-780T as illustrated in the example in ([Figure 5](#)):

1. Connect the HDMI IN Connector on TP-780T to the HDMI source (for example, a Blu-ray player).
2. Connect an IR sensor cable to the IR 3.5mm Mini Jack Connector on TP-780T.
3. Connect an RS-232 controller (for example, SL-240C) to the RS-232 Connector on TP-780T.

4. Connect the HDMI OUT Connector (8) on the **WP-789R** front panel to the HDMI sink (for example, a display).
5. Connect the IR Terminal Block Connector (9) on the **WP-789R** front panel to the HDMI sink via an IR emitter cable.
6. Connect the RS-232 Terminal Block Connector (11) on the **WP-789R** rear panel to the HDMI sink.
7. Connect the HDBT IN RJ-45 Connector (14) on the **WP-789R** rear panel to the HDBT OUT RJ-45 Connector on **TP-780T**.
8. Connect the power adapter to **TP-780T** rear panel (not shown in [Figure 4](#)) and to the mains electricity.

Connecting TP-789R/TP-789Rxr to WP-20

In this connection illustration:

- **TP-789Rxr** acts as a PoE provider, providing power to **WP-20**.
- A controller is used to control the video acceptor via RS-232 control extension over HDBaseT and the video acceptor via Ethernet control extension over HDBaseT.



For illustrative purposes, the figure below shows **TP-789Rxr**, but the same connections apply to **TP-789R** except for the Ethernet connection.

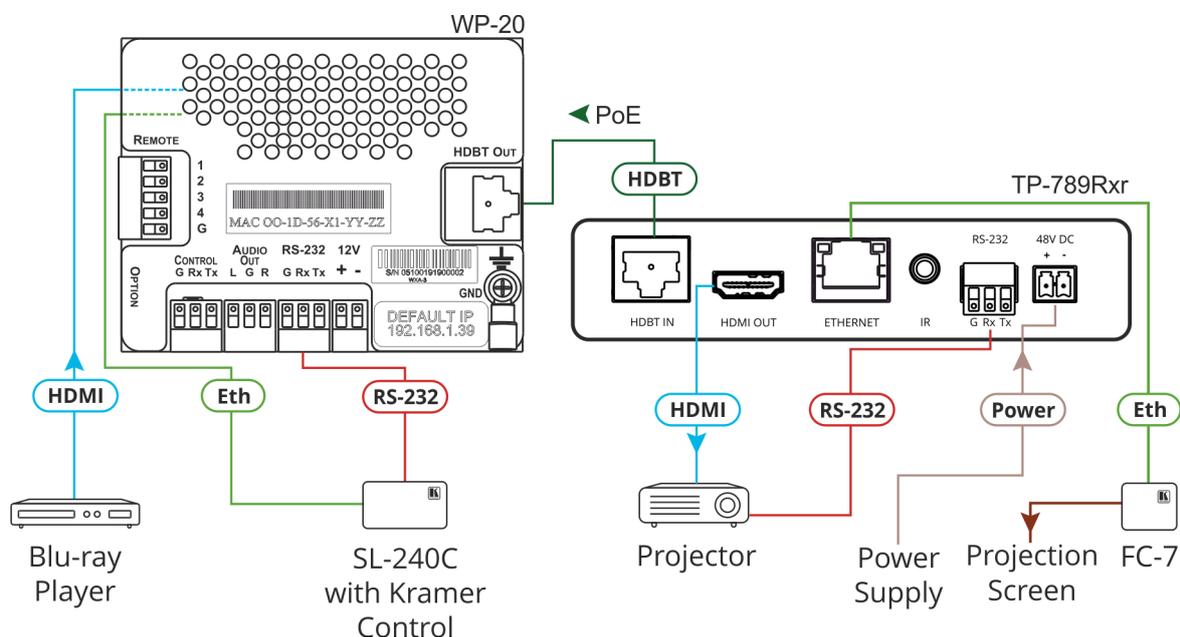


Figure 6: Connecting **TP-789Rxr** to **WP-20**

To connect **TP-789R/TP-789Rxr** as illustrated in the example in [Figure 6](#):

1. Connect the HDMI source (for example, a Blu-ray player) to the HDMI IN Connector on the **WP-20** front panel.
2. Connect the HDMI OUT Connector (22) on the **TP-789R/TP-789Rxr** rear panel to the HDMI acceptor (for example, a projector).

3. Connect the RS-232 Terminal Block Connector (25) on the **TP-789R/TP-789Rxr** rear panel to the HDMI acceptor.
4. Do one or both of the following:
 - a. Connect the RS-232 Terminal Block Connector on the **WP-20** rear panel to an RS-232 controller (for example, **SL-240C**).
 - b. Connect the Ethernet RJ-45 Connector on the **WP-20** rear panel to a LAN-enabled to controller (for example, **SL-240C**).
5. Connect the HDBT OUT RJ-45 Connector on the **WP-20** rear panel to the HDBT IN RJ-45 Connector (21) on the **TP-789R/TP-789Rxr** rear panel.
6. Connect a LAN-enabled device (for example, **FC-7** connected to a projection screen) to the Ethernet RJ-45 Connector (23) on the **TP-789Rxr** rear panel.
7. Connect the power adapter to the 48V DC Power Terminal Block (26) on **TP-789R/TP-789Rxr** rear panel and to the mains electricity (not shown in [Figure 6](#)).

Connecting TP-789R/TP-789Rxr as PoE Acceptor

In this connection illustration:

- **TP-789Rxr** acts as a PoE acceptor, receiving power from **TP-780Txr**.
- A controller is used to control the video acceptor via RS-232 control extension over HDBaseT.
- An IR remote is used to control the video source via IR control extension over HDBaseT.



For illustrative purposes, the figure below shows **TP-789Rxr**, but the same connections apply to **TP-789R** except for the Ethernet connection.

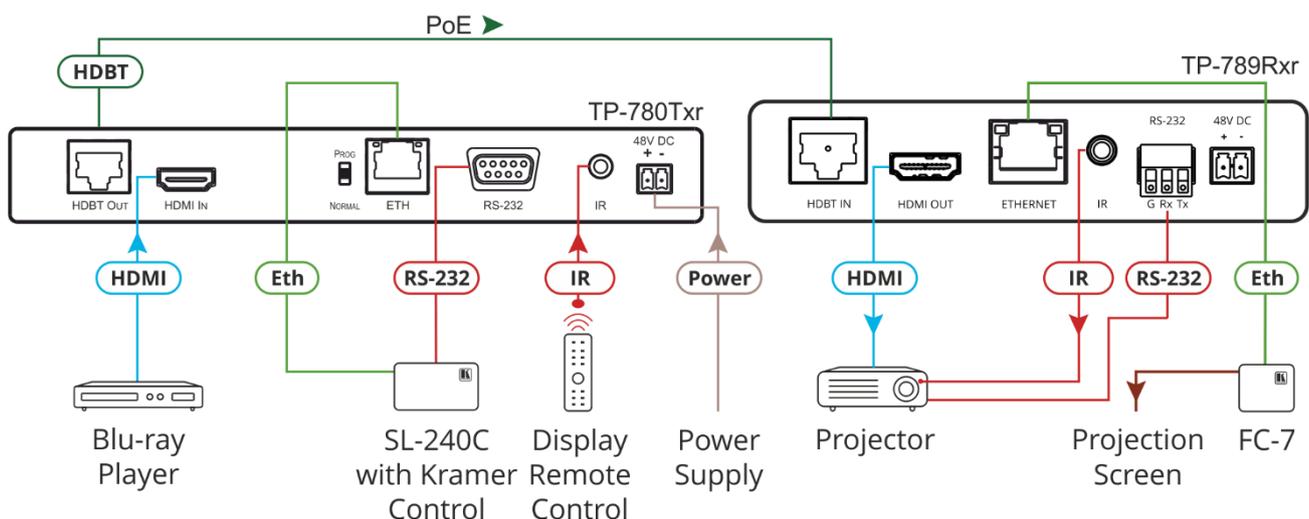


Figure 7: Connecting TP-789R/TP-789Rxr as PoE Acceptor

To connect the TP-789R/TP-789Rxr as illustrated in the example in [Figure 7](#):

1. Connect the HDMI IN Connector on the **TP-780Txr** rear panel to the HDMI source (for example, a Blu-ray player).
2. Connect the HDMI OUT Connector (22) on the **TP-789R/TP-789Rxr** rear panel to the HDMI acceptor (for example, a projector).
3. Do one of the following:
 - a. Connect the RS-232 Terminal Block Connector (25) on the **TP-789R/TP-789Rxr** rear panel to the HDMI acceptor.
 - b. Connect the IR 3.5mm Mini Jack Connector (24) on the **TP-789R/TP-789Rxr** rear panel to the HDMI acceptor via an IR emitter cable.
4. Connect the IR 3.5mm Mini Jack Connector on the **TP-780Txr** rear panel to an IR sensor cable to for controlling the HDMI acceptor from the transmitter side.
5. Do one or both of the following:
 - a. Connect the RS-232 D-sub Connector on the **TP-780Txr** rear panel to an RS-232 controller (for example, **SL-240C**).
 - b. Connect the Ethernet RJ-45 Connector on the **TP-780Txr** rear panel to a LAN-enabled to controller (for example, **SL-240C**).
6. Connect the HDBT OUT RJ-45 Connector on the **TP-780Txr** rear panel to the HDBT IN RJ-45 Connector (21) on the **TP-789R/TP-789Rxr** rear panel.
7. Connect a LAN-enabled device (for example, **FC-7** control gateway) to the Ethernet Connector (23) on the **TP-789Rxr** rear panel.
8. Connect the power adapter to the 48V DC Power Terminal Block on **TP-780Txr** rear panel and to the mains electricity (not shown in [Figure 7](#)).

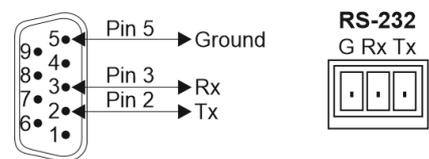
Connecting to Device via RS-232

You can connect to **WP-789T**, **WP-789R**, **TP-789R**, **TP-789Rxr** via the RS-232 3-pin Terminal Block Connector. The RS-232 connection can be used in the following ways:

- Serial Communication Extension – Connect a serial controller, for example **SL-240C** for extending RS-232 communication to the other end of the HDBaseT extension to control an external device.
- Firmware Upgrade – Contact your local technical support.

To connect to **WP-789T**, **WP-789R**, **TP-789R**, **TP-789Rxr** via RS-232 from a D-sub connector:

- Pin 2 to the Tx pin on the **WP-789T**, **WP-789R**, **TP-789R**, **TP-789Rxr** RS-232 terminal block.
- Pin 3 to the Rx pin on the **WP-789T**, **WP-789R**, **TP-789R**, **TP-789Rxr** RS-232 terminal block.
- Pin 5 to the G pin on the **WP-789T**, **WP-789R**, **TP-789R**, **TP-789Rxr** RS-232 terminal block.



Grounding WP-789T, WP-789R (Optional)

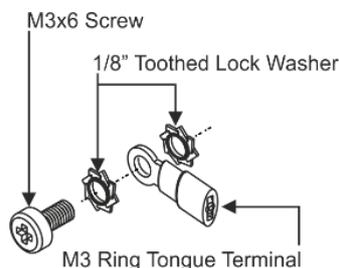


Figure 8: Grounding **WP-789T**, **WP-789R**

To ground **WP 789T**, **WP 789R**:

1. Connect the ring tongue terminal to the building grounding point wire (a green-yellow, AWG#18 (0.82mm²) wire, crimped with a proper hand-tool is recommended).
2. Insert the M3x6 screw through the toothed lock washers and the tongue terminal in the order shown above.
3. Insert the M3x6 screw (with the two toothed lock washers and ring tongue terminal) into the grounding screw hole and tighten the screw.

Connecting to WP-789T, WP-789R IR Terminal Block

WP-789T can either emit or receive an IR signal and WP-789R can emit an IR signal. This section explains how to connect an IR emitter or sensor to the WP-789T or WP-789R IR terminal block in order to achieve the required configuration.



Both WP-789T/WP-789R and the HDBaseT unit on the other end need to have identical IR frequency settings.

Emitting 38kHz IR Signals

WP-789T and WP-789R can emit a 38kHz IR signal, received via the HDBaseT receiver using a fixed 38kHz IR sensor, to control a device that is connected to WP-789T or WP-789R (for example, a Blu-ray player source or display).

To emit a 38kHz IR signal:

- Connect the emitter wires to the WP-789T or WP-789R IR terminal block as illustrated in [\(Figure 9\)](#).

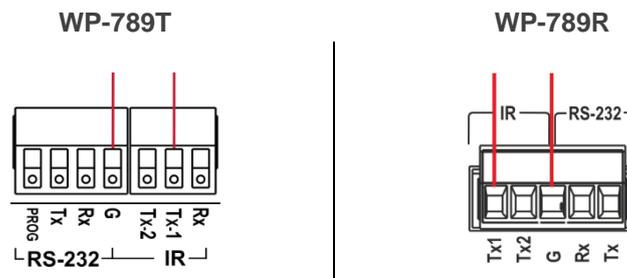


Figure 9: Connecting 38kHz IR Emitter – 38kHz

Emitting Wide-Range Modulated IR Signals

WP-789T and WP-789R can emit a wide-range modulated IR signal, received via the HDBaseT receiver using a wide-range IR sensor, to control a device that is connected to WP-789T or WP-789R (for example, a Blu-ray player source or display).

To emit a wide-range modulated IR signal:

- Connect the emitter wires to the WP-789T or WP-789R IR terminal block as illustrated in [\(Figure 10\)](#).

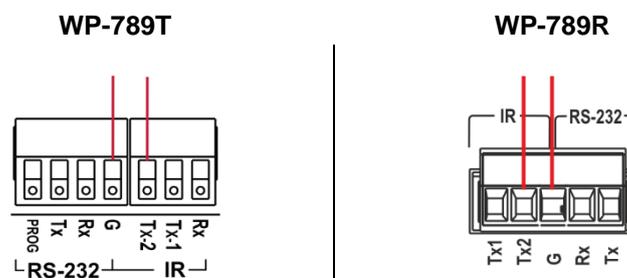


Figure 10: Connecting IR Emitter – Wide-Range Modulated

Extending IR Signals

WP-789T can receive IR commands from the IR port of a controller (for example, Kramer **SL-240C**). **WP-789T** can then extend the signal to an acceptor (for example, a display) that is connected to the IR port of the HDBaseT receiver (for example, Kramer **TP-789R**) via IR emitter cable.

To extend an IR signal from a controller:

- Connect the controller IR output to the **WP-789T** IR terminal block as illustrated in [Figure 11](#).

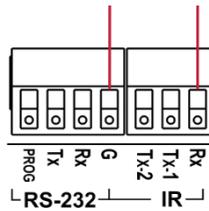


Figure 11: Connecting IR Controller

Configuring WP-789T, WP-789R, TP-789R, TP-789Rxr

WP-789T, WP-789R, TP-789R, TP-789Rxr enable you to configure IR frequency and TP-789Rxr enables you to configure HDBaseT range.

Setting DIP-Switches

TP-789R and TP-789Rxr include DIP-switches that enable you to set the HDBaseT range, and IR frequency.

-  All DIP-switches are set to OFF (up) by default.
-  Changes to DIP-switch 4 only take effect after rebooting the device. Changes to the other DIP switches take effect immediately.

SETUP

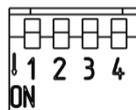


Figure 12: TP-789R/TP-789Rxr DIP-Switches

#	Feature	Dip-switch Settings
1	TP-789Rxr HDBaseT Range Mode	OFF – Normal HDBaseT range. ON – HDBaseT ultra-long range (provides increased range at a reduced bandwidth).
	TP-789R Reserved	For future use.
2	Reserved	For future use. Set to OFF (up).
3	IR Frequency	OFF – IR frequency is 38kHz. ON – Wide-range modulated IR frequency.  Set to OFF for backward compatibility with 38kHz IR extension.
4	FW Upgrade	OFF – Normal operation mode. ON – FW upgrade mode (contact customer support).  When set to ON device operation is disabled.

Setting IR Frequency

WP-789T, WP-789R, TP-789R, TP-789Rxr enable you to set the IR frequency to either fixed 38kHz or wide-range modulated frequency. Set the device to 38kHz for backward compatibility with 38kHz IR extension.

Setting TP-789R/TP-789Rxr IR Frequency

To set the TP-789R/TP-789Rxr IR Frequency:

- Set DIP-switch 3 according to the DIP-switch configuration table (see [Setting DIP-Switches](#) on page [19](#)).

Setting WP-789T and WP-789R IR Frequency

To set the WP-789T and WP-789R frequency:

- Wire the IR terminal block according the instructions above (see [Connecting to WP-789T, WP-789R IR Terminal Block](#) on page [17](#)).

Setting HDBaseT Range Mode for TP-789Rxr

TP-789Rxr enables you to set the HDBaseT range mode as either normal or ultra-long, which provides increased range at a reduced bandwidth.

To set the TP-789Rxr HDBaseT range mode:

- Set DIP-switch 1 according to the DIP-switch configuration table (see [Setting DIP-Switches](#) on page [19](#)).

Upgrading Firmware

Contact technical support to upgrade the WP-789T, WP-789R, TP-789R, TP-789Rxr device firmware

Technical Specifications

WP-789T Technical Specifications

Inputs	HDMI	On a female HDMI connector
	IR	On 2-pin terminal block connectors (Tx-1 or Tx-2 and G) for signal extension over HDBaseT
Outputs	HDBaseT	On a female RJ-45 connector
	IR	On 2-pin (Rx (on IR), G) terminal block connectors for emitting signal received from HDBaseT
Ports	RS-232 for Signal Extension over HDBaseT	On 3-pin terminal block connectors (G, Rx, Tx)
	RS-232 for FW Upgrade	On 3-pin terminal block connectors (G, Rx, PROG)
Video	Max Bandwidth	10.2Gbps
	Max Resolution	4K@60 (4:2:0)
	Compliance	HDCP 1.4 and 2.2 pass-through, EDID and CEC pass-through
	HDMI Support	Deep color, x.v.Color™, lip sync, HDMI uncompressed audio channels, Dolby TrueHD, DTS-HD, 2K, 4K, and 3D as specified in HDMI 2.0
Extension Range	4K@60Hz (4:2:0)	Up to 40m (130ft)
	Full HD (1080p@60Hz)	Up to 70m (230ft)
Extended RS-232	Baud Rate	300 to 115200
Extended IR	Direction	Bidirectional (receiver and transmitter)
	Frequency	Wide-range modulated: 20kHz to 100kHz Fixed: 38kHz
Power	Consumption with Power Adapter	12V DC, 250mA
	Source	12V DC, 2A
Environmental Conditions	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
Regulatory Compliance	Safety	CE
	Environmental	RoHs, WEEE
Enclosure	Net Dimensions (W, D, H)	US-D: 7cm x 3.1cm x 11.4cm (2.8" x 1.2" x 4.5) EU: 8cm x 3.1cm x 8cm (3.1" x 1.2" x 3.1) UK: 8.6cm x 3.1cm x 8.6cm (3.4" x 1.2" x 3.4")
	Shipping Dimensions (W, D, H)	23.2cm x 13.6cm x 10cm (9.1" x 5.4" x 3.9")
	Net Weight	0.17kg (0.4lbs)
	Shipping Weight	0.56kg (1.2lbs) approx.
	Type	Aluminum
	Cooling	Convection ventilation
Accessories	Included	1 Power adapter, 1 power cord, installation accessories For the US version: 2 US-D frame sets and faceplates (in black and in white) For the European version: 1 EU white frame, 1 UK white frame, 1 EU/UK white faceplate
Specifications are subject to change without notice at www.kramerav.com .		

WP-789R Technical Specifications

Inputs	HDBaseT	On a female RJ-45 connector
Outputs	HDMI	On a female HDMI connector
	IR	On 2-pin terminal block connectors (Tx-1 or Tx-2 and G) for signal extension over HDBaseT line
Ports	RS-232 for Signal Extension over HDBaseT	On a 3-pin terminal block connector (G, Rx, Tx)
	RS-232 for FW Upgrade	On a 3-pin terminal block connector (G, Rx, PROG)
Video	Max Bandwidth	10.2Gbps
	Max Resolution	4K@60 (4:2:0)
	Compliance	Supports HDCP 2.2, deep color, x.v.Color™, lip sync, HDMI uncompressed audio channels, Dolby TrueHD, DTS-HD, 2K, 4K, and 3D as specified in HDMI 2.0
Extension Range	4K@60Hz (4:2:0)	Up to 40m (130ft)
	Full HD (1080p@60Hz)	Up to 70m (230ft)
Extended RS-232	Baud Rate	300 to 115200
Extended IR	Direction	Receiver
	Frequency	Wide-range modulated: 20kHz to 100kHz Fixed: 38kHz
Power	Consumption with Power Adapter	500mA
	Source	12V DC, 2A power adapter or PoE
Environmental Conditions	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
Regulatory Compliance	Safety	CE
	Environmental	RoHs, WEEE
Enclosure	Size	2-gang
	Type	Aluminum
	Cooling	Convection ventilation
Accessories	Included	1 Power adapter, 1 power cord, installation accessories For the US version: 1 US-D frame set and faceplate For the European version: 1 EU white frame, 1 UK white frame, 1 EU/UK white faceplate
Specifications are subject to change without notice at www.kramerav.com .		

TP-789R/TP-789Rxr Technical Specifications

Input	HDBaseT	On an RJ-45 connector
Output	HDMI	On a female HDMI connector
Ports	RS-232	On a 3-pin terminal block connector for serial link extension
	IR	On a 3.5mm mini-jack connector for IR link extension
	100BaseT Ethernet (TP-789Rxr)	On an RJ-45 female connector for LAN extension
Video	Max Bandwidth	10.2Gbps
	Max Resolution	4K@60 (4:2:0)
	Compliance	HDCP 2.2
	HDMI Support	Deep color, x.v.Color™, lip sync, HDMI uncompressed audio channels, Dolby TrueHD, DTS-HD, 2K, 4K, and 3D as specified in HDMI 2.0.
Extension	4k@60 (4:2:0) Range	TP-789R: Up to 40m (130ft) TP-789Rxr: Up to 100m (330ft)
	Full HD (1080p@60Hz) Range	TP-789R: Up to 70m (230ft) TP-789Rxr: Up to 130m (430ft) at HDBaseT normal range mode, up to 180m (590ft) at HDBaseT ultra-long-range mode
	Compliance	HDBaseT 1.0
Extended Ethernet (TP-789Rxr)	Bandwidth	Up to 100Mbps
Extended RS-232	Baud Rate	300 to 115200
Extended IR	Frequency	20kHz to 100kHz
	Direction	Bidirectional (IR sensor or emitter)
Controls	Front Panel	IN, OUT, LINK, POE FEEDER and ON LED indicators
	Rear Panel	DIP-switches
Power	Consumption	TP-789R: 48V DC, 350mA TP-789Rxr: 48V DC, 370mA
	With PoE	13 Watt
	Source	48V DC, 1.36A
Environmental Conditions	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
Regulatory Compliance	Safety	CE
	Environmental	RoHs, WEEE
Enclosure	Size	Tool
	Type	Aluminum
	Cooling	Convection ventilation
General	Net Dimensions (W, D, H), each	12cm x 7.2cm x 2.4cm (4.7" x 2.8" x 0.94")
	Shipping Dimensions (W, D, H)	15.7cm x 12cm x 8.7cm (6.2" x 4.7" x 3.4")
	Net Weight, each	0.2kg (0.44bs) approx.
	Shipping Weight	0.72kg (1.6lbs) approx.
Accessories	Included	1 Power adapter, 1 power cord and 1 bracket set per device
Specifications are subject to change without notice at www.kramerav.com .		

The warranty obligations of Kramer Electronics Inc. ("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 this Coverage Lasts

The standard limited warranty for Kramer products is seven (7) years from the date of original purchase, with the following exceptions:

1. All Kramer VIA hardware products are covered by a standard three (3) year warranty for the VIA hardware and a standard three (3) year warranty for firmware and software updates; all Kramer VIA accessories, adapters, tags, and dongles are covered by a standard one (1) year warranty.
2. Kramer fiber optic cables, adapter-size fiber optic extenders, pluggable optical modules, active cables, cable retractors, ring mounted adapters, portable power chargers, Kramer speakers, and Kramer touch panels are all covered by a standard one (1) year warranty.
3. All Kramer Cobra products, all Kramer Calibre products, all Kramer Minicom digital signage products, all HighSecLabs products, all streaming, and all wireless products are covered by a standard three (3) year warranty.
4. All Sierra Video MultiViewers are covered by a standard five (5) year warranty.
5. Sierra switchers & control panels are covered by a standard seven (7) year warranty (excluding power supplies and fans that are covered for three (3) years).
6. K-Touch software is covered by a standard one (1) year warranty for software updates.
7. All Kramer passive cables are covered by a ten (10) year warranty.

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. If a direct or similar replacement product is supplied, the original product's end warranty date remains unchanged and is transferred to the replacement 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

To obtain a remedy under this limited warranty, you must contact either the authorized Kramer Electronics reseller from whom you purchased this product or the Kramer Electronics office nearest you. For a list of authorized Kramer Electronics resellers and/or Kramer Electronics authorized service providers, visit our web site at www.kramerav.com or contact the Kramer Electronics office nearest you.

In order to pursue any remedy under this limited warranty, you must possess an original, dated receipt as proof of purchase from an authorized Kramer Electronics reseller. If this product is returned under this limited warranty, a return authorization number, obtained from Kramer Electronics, will be required (RMA number). You may also be directed to an authorized reseller or a person authorized by Kramer Electronics to repair the product.

If it is decided that this product should be returned directly to Kramer Electronics, this product should be properly packed, preferably in the original carton, for shipping. Cartons not bearing a return authorization number will be refused.

Limitation of Liability

THE MAXIMUM LIABILITY OF KRAMER ELECTRONICS UNDER THIS LIMITED WARRANTY SHALL NOT EXCEED THE ACTUAL PURCHASE PRICE PAID FOR THE PRODUCT. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS IS NOT RESPONSIBLE FOR DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR CONDITION, OR UNDER ANY OTHER LEGAL THEORY. Some countries, districts or states do not allow the exclusion or limitation of relief, special, incidental, consequential or indirect damages, or the limitation of liability to specified amounts, so the above limitations or exclusions may not apply to you.

Exclusive Remedy

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS LIMITED WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. TO THE MAXIMUM EXTENT PERMITTED BY LAW, KRAMER ELECTRONICS SPECIFICALLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IF KRAMER ELECTRONICS CANNOT LAWFULLY DISCLAIM OR EXCLUDE IMPLIED WARRANTIES UNDER APPLICABLE LAW, THEN ALL IMPLIED WARRANTIES COVERING THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY TO THIS PRODUCT AS PROVIDED UNDER APPLICABLE LAW.

IF ANY PRODUCT TO WHICH THIS LIMITED WARRANTY APPLIES IS A "CONSUMER PRODUCT" UNDER THE MAGNUSON-MOSS WARRANTY ACT (15 U.S.C.A. §2301, ET SEQ.) OR OTHER APPLICABLE LAW, THE FOREGOING DISCLAIMER OF IMPLIED WARRANTIES SHALL NOT APPLY TO YOU, AND ALL IMPLIED WARRANTIES ON THIS PRODUCT, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR THE PARTICULAR PURPOSE, SHALL APPLY AS PROVIDED UNDER APPLICABLE LAW.

Other Conditions

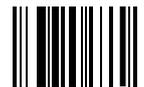
This limited warranty gives you specific legal rights, and you may have other rights which vary from country to country or state to state.

This limited warranty is void if (i) the label bearing the serial number of this product has been removed or defaced, (ii) the product is not distributed by Kramer Electronics or (iii) this product is not purchased from an authorized Kramer Electronics reseller. If you are unsure whether a reseller is an authorized Kramer Electronics reseller, visit our web site at www.kramerav.com or contact a Kramer Electronics office from the list at the end of this document.

Your rights under this limited warranty are not diminished if you do not complete and return the product registration form or complete and submit the online product registration form. Kramer Electronics thanks you for purchasing a Kramer Electronics product. We hope it will give you years of satisfaction.



P/N: 2900-301206



Rev: 2



SAFETY WARNING

Disconnect the unit from the power supply before opening and servicing

For the latest information on our products and a list of Kramer distributors, visit our Web site where updates to this user manual may be found.

We welcome your questions, comments, and feedback.

The terms HDMI, HDMI High-Definition Multimedia Interface, and the HDMI Logo are trademarks or registered trademarks of HDMI Licensing Administrator, Inc. DECORA® is a registered trademark of Leviton Manufacturing Co., Inc. All brand names, product names, and trademarks are the property of their respective owners.