

# User Manual

## TPUH451

4K HDBaseT 2.0™ Extender w/ HDMI® & USB 2.0

KVM support



All Rights Reserved



Version: TPUH451\_2018V1.3

[www.PTN-electronics.com](http://www.PTN-electronics.com)

## Preface

Read this user manual carefully before using the product. Pictures are shown in this manual for reference only. Different models and specifications are subject to real product.

This manual is only for operation instruction, please contact the local distributor for maintenance assistance. The functions described in this version were updated till March 2018. In the constant effort to improve the product, we reserve the right to make functions or parameters changes without notice or obligation. Please refer to the dealers for the latest details.

## Trademarks

Product model and logo are trademarks. Any other trademarks mentioned in this manual are acknowledged as the properties of the trademark owner. No part of this publication may be copied or reproduced without prior written consent.

## FCC Statement

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at their own expense will be required to take whatever measures may be necessary to correct the interference

Any changes or modifications not expressly approved by the manufacture would void the user's authority to operate the equipment.



## **SAFETY PRECAUTIONS**

To ensure the best from the product, please read all instructions carefully before using the device. Save this manual for further reference.

- Unpack the equipment carefully and save the original box and packing material for possible future shipment.
- Follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- Do not dismantle the housing or modify the module. It may result in electrical shock or burn.
- Using supplies or parts not meeting the products' specifications may cause damage, deterioration or malfunction.
- Refer all servicing to qualified service personnel.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Do not put any heavy items on the extension cable in case of extrusion.
- Do not remove the housing of the device as opening or removing housing may expose you to dangerous voltage or other hazards.
- Install the device in a place with fine ventilation to avoid damage caused by overheat.
- Keep the module away from liquids.
- Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on to the housing, unplug the module immediately.
- Do not twist or pull by force ends of the optical cable. It can cause malfunction.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- Unplug the power cord when left unused for a long period of time.
- Information on disposal for scrapped devices: do not burn or mix with general household waste, please treat them as normal electrical wastes.

## Contents

1. Product Introduction.....	1
1.1 Features .....	1
1.2 Packing List .....	1
2. Panel Description.....	2
2.1 TPUH451T.....	2
2.2 TPUH451R .....	3
3. System Connection.....	5
3.1 Usage Precautions .....	5
3.2 System Diagram .....	5
3.3 Connection Procedure.....	6
4. Specification .....	7
5. Panel Drawing .....	8
6. Troubleshooting & Maintenance .....	9
7. Customer Service .....	10

## 1. Product Introduction

Compliant with HDMI 1.4 & HDCP 2.2, The TPUH451 is a 4K HDMI Extender set developed with the latest HDBaseT™ 2.0 technology to extend uncompressed HDMI video, audio, USB 2.0, control signals and PoC over a single CAT5e/6 cable. The unidirectional PoC compliant extender comes with only one power supply, which means that the Receiver (TPUH451R) can be powered via Transmitter (TPUH451T) to save installers time and added cost to installing a power outlet. Ideally designed for smart displays and KVM solutions fitting digital signage markets.

### 1.1 Features

- Compatible with HDMI 1.4 and is backwards compatible with all previous HDMI standards(e.g. HDMI 1.4), delivers high-resolution AV signal(1080p 3D, 4Kx2K@60Hz)
- Support HDBT2.0, transmit 1080P/4Kx2K signal up to 100m over single CAT6 cable
- EDID Pass-Thru
- HDCP 2.2 compliant
- Front panel status LEDs for power, link & HDCP
- USB & RS232 control
- Unidirectional PoC

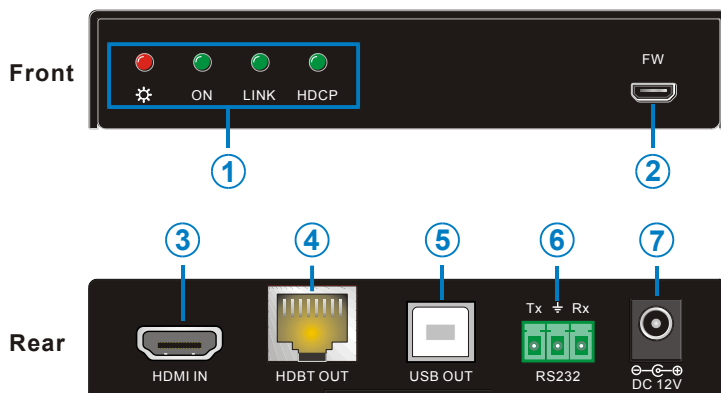
### 1.2 Packing List

- |   |                        |
|---|------------------------|
| • 1 x TPUH451T                              | • 1 x TPUH451R         |
| • 4 x Detachable Mounting Ears              | • 4 x Screws           |
| • 1 x Power Adapter (DC 12V 2A)             | • 8 x Plastic Cushions |
| • 2 x RS232 cables (Phoenix to 9 Pin D-Sub) | • 1 x User manual      |

**Note:** Please contact your distributor immediately if any damage or defect in the components is found.

## 2. Panel Description

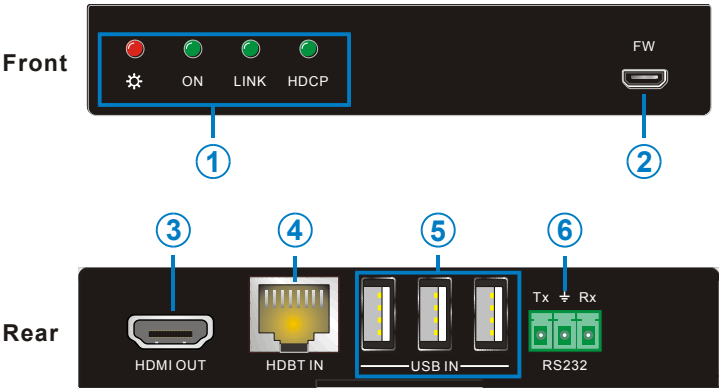
### 2.1 TPUH451T



No.	Name	Description
①	Indicators	<b>Power:</b> <ul style="list-style-type: none"> <li>• OFF: No power</li> <li>• RED: DC power present</li> </ul>
		<b>ON:</b> Working status indicator <ul style="list-style-type: none"> <li>• OFF: Not operational</li> <li>• Blinking GREEN: Normal operation</li> </ul>
		<b>LINK:</b> HDBT Link status indicator <ul style="list-style-type: none"> <li>• OFF: No Link</li> <li>• GREEN: Link successful</li> <li>• Blinking GREEN: Link problem</li> </ul>
		<b>HDCP:</b> HDCP compliant indicator <ul style="list-style-type: none"> <li>• OFF: No HDMI traffic(no picture)</li> <li>• GREEN: HDMI signal with HDCP</li> <li>• Blinking GREEN: HDMI signal without HDCP</li> </ul>
②	FW	Micro USB port, used for firmware update. Firmware updated need auxiliary equipment, please contact with our after-sales department for more details.
③	HDMI IN	Connect with HDMI source

④	HDBT OUT	Connect to the <b>HDBT IN</b> port on rear panel of TPUH451R via CAT5e/CAT6a cable, compliant with HDBT2.0 and support unidirectional PoC to power TPUH451R.
⑤	USB OUT	Type-B USB port, connect to PC to receive remote USB control
⑥	RS232	Serial port, connects with control device or device to be controlled, supports bi-directional RS232 control.
⑦	DC 12V	Connect with a DC12V 2A power adapter.

2.2 TPUH451R



No.	Name	Description
①	Indicators	<b>Power:</b> <ul style="list-style-type: none"><li>• OFF: No power</li><li>• RED: DC power present</li></ul>
		<b>ON:</b> Working status indicator <ul style="list-style-type: none"><li>• OFF: Not operational</li><li>• Blinking GREEN: Normal operation</li></ul>
		<b>LINK:</b> HDBT Link status indicator <ul style="list-style-type: none"><li>• OFF: No Link</li><li>• GREEN: Link successful</li><li>• Blinking GREEN: Link problem</li></ul>
		<b>HDCP:</b> HDCP compliant indicator <ul style="list-style-type: none"><li>• OFF: No HDMI traffic(no picture)</li></ul>

		<ul style="list-style-type: none"><li>• GREEN: HDMI signal with HDCP</li><li>• Blinking GREEN: HDMI signal without HDCP</li></ul>
②	FW	Micro USB port, used for firmware update. Firmware updated need auxiliary equipment, please contact with our after-sales department for more details.
③	HDMI OUT	Connect with HDMI display
④	HDBT IN	Connect to the <b>HDBT OUT</b> port on the TPUH451T via CAT5e/ CAT6a cable, compliant with HDBT2.0.
⑤	USB IN	Type-A USB ports, connect to mouse/ keyboard/ U-disk for remote USB access
⑥	RS232	Serial port, connects with control device or device to be controlled, supports bi-directional RS232 control

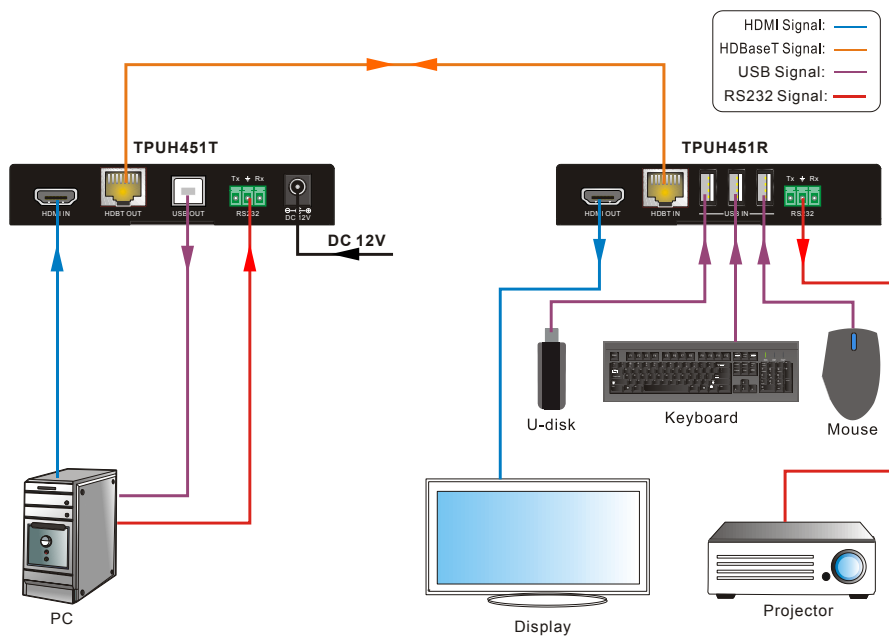


## 3. System Connection

### 3.1 Usage Precautions

- Make sure all components and accessories included before installation.
- System should be installed in a clean environment with proper temperature and humidity.
- All of the power switches, plugs, sockets, and power cords should be insulated and safe.
- All devices should be connected before power on.

### 3.2 System Diagram



### 3.3 Connection Procedure

**Step1.** Connect HDMI source (such as PC) to **HDMI IN** port of TPUH451T with an HDMI cable.

**Step2.** Connect **HDBT OUT** port of TPUH451T to **HDBT IN** port of TPUH451R through a straight-thru CAT5e/CAT6 cable.

**Step3.** Connect a HDMI display to **HDMI OUT** port of TPUH451R with HDMI cable;

**Step4.** When using the USB control, do the following:

- a) Connect PC to the **USB OUT** port of TPUH451T.
- b) Connect Mouse/ Keyboard/U-disk to the **USB IN** port(s) of TPUH451R.

**Step5.** When using the bi-directional RS232 control, do the following:

- a) Connect PC to the RS232 port at either TPUH451T or the TPUH451R.
- b) Connect a third-party device (such as projector) need to be controlled to the **RS232** port at the other end.
- c) Send RS232 commands to control the third-party device. For more details about RS232 commands, please refer to the user manual for the third-party device.

**Step6.** Connect with DC12V power adaptor to the power port of TPUH451T, TPUH451R will be powered synchronously via PoC.

**Note:**

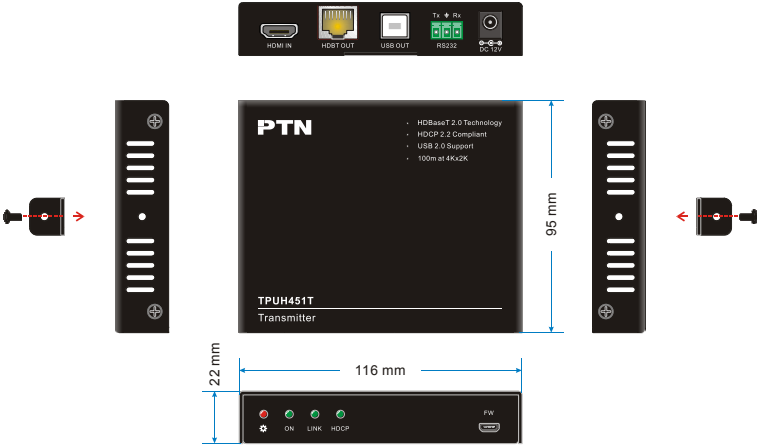
- *System Diagram shown in this manual is for reference only, more specific schemes depend on real-time applications.*
- *Connect HDBT ports via straight-thru CAT5e/6 cable with TIA/EIAT568B standard terminations at both ends.*
- *RS232 communication protocol: Baud Rate: 9600; data bit: 8; stop bit: 1; parity: none. HDBT Transceiver receives RS232 control from devices with various baud rate (2400, 4800, 9600, 19200, 38400, 57600, 115200).*
- *HDBT ports can work with our company's HDBT products that has same power supply solution.*

## 4. Specification

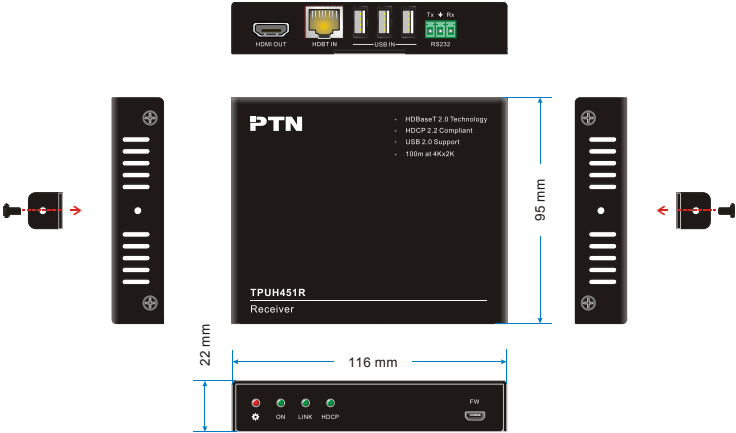
<b>TPUH451T</b>	
Input	(1) HDMI (19 pin Type-A male)
Output	(1) HDBT (RJ45 female); (1) USB OUT (Type-B)
Other	(1) RS232 (3-pin pluggable terminal block)
<b>TPUH451R</b>	
Input	(1) HDBT (RJ45 female); (1) USB IN (Type-A)
Output	(1) HDMI (19 pin Type-A male)
Other	(1) RS232 (3-pin pluggable terminal block)
<b>General</b>	
HDMI Embedded audio	PCM/Dolby Digital/DTS/DTS-HD
Signal Standard	HDMI 1.4& HDCP 2.2
Transmission Mode	HDBaseT2.0
Transmission Distance	1080P/4Kx2K≤100m(Cat6)
Resolution	Up to 4K×2K@60Hz 4:2:0
Bandwidth	10.2Gbps
EDID Management	EDID Pass-Thru
Operation Temperature	0 ~ +40°C
Storage Temperature	-10 ~ +55°C
Relative Humidity	10% ~ 90%
External Power Supply	Input:100V~240V AC; Output: DC 12V 2A
Power Consumption	18W(max)
Dimension (W*H*D)	4.5"x 0.86" x 3.74"/116 x 22 x 95(mm)
Net weight	TX:197g; RX:198g

**Note:** All nominal levels are at ±10%.

5. Panel Drawing



TPUH451T



TPUH451R

## 6. Troubleshooting & Maintenance

Problems	Potential Causes	Solutions
No reaction to any operation, power indicator is off	Haven't been powered on	Insert power adapter to Transmitter.
Abnormal indication of the status LEDs	Wrong specification of the power adapter	Change for DC 12V 2A power adapter.
Color lose or poor picture quality	Signal loss caused by long transmission distance beyond effective value	Make sure the connecting cable is within 100m and of good quality.
	Bad quality of the HDMI cable	Ensure the HDMI cables used at source, Transmitter, Receiver and display are properly connected and are of good quality
Cannot use the device	the device is broken	Send it to authorized dealer for repairing.

**Note:** If your problem persists after following the above troubleshooting steps, seek further help from authorized dealer or our technical support.

## 7. Customer Service

The return of a product to our Customer Service implies the full agreement of the terms and conditions hereinafter. These terms and conditions may be changed without prior notice.

### 1) Warranty

The limited warranty period of the product is fixed three years.

### 2) Scope

These terms and conditions of Customer Service apply to the customer service provided for the products or any other items sold by authorized distributor only.

### 3) Warranty Exclusions:

- Warranty expiration.
- Factory applied serial number has been altered or removed from the product.
- Damage, deterioration or malfunction caused by:
  - ✓ Normal wear and tear.
  - ✓ Use of supplies or parts not meeting our specifications.
  - ✓ No certificate or invoice as the proof of warranty.
  - ✓ The product model showed on the warranty card does not match with the model of the product for repairing or had been altered.
  - ✓ Damage caused by force majeure.
  - ✓ Servicing not authorized by distributor.
  - ✓ Any other causes which does not relate to a product defect.
- Shipping fees, installation or labor charges for installation or setup of the product.

### 4) Documentation:

Customer Service will accept defective product(s) in the scope of warranty coverage at the sole condition that the defect has been clearly defined, and upon reception of the documents or copy of invoice, indicating the date of purchase, the type of product, the serial number, and the name of distributor.

**Remarks:** For further assistance or solutions, please contact your local distributor.





---

**[www.PTN-electronics.com](http://www.PTN-electronics.com)**

**PTN Electronics Limited**

**Tel:** +86-755-2846 1819

**Fax:** +86-755-8471 7796

**Email:** [info@PTN-electronics.com](mailto:info@PTN-electronics.com)

**Website:** [www.PTN-electronics.com](http://www.PTN-electronics.com)

