



User Manual

HDMI over Single Cat.X Extender with HDBaseT, RS232, Bi-directional IR, Ethernet & POC

Model PT-E-HD50

Designed in Germany

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Section 1: Getting Started

1.1 Safety and Notice

Please read all of these instructions carefully before you use the device. Save this manual for future reference.

The PT-E-HD50 HDMI over Single Cat.X Extender with HDBaseT, RS232, Bi-directional IR, Ethernet & POC is compliant to safety regulations and requirements and has been certified for international use. However, like all electronic equipment, the PT-E-HD50 should be used with care. Please read and follow the safety instructions to protect yourself from possible injury and to minimize the risk of damage to the unit.

- Follow all instructions and warnings marked on this unit.
- Do not attempt to service this unit yourself, except where explained in this manual.
- Provide proper ventilation and air circulation and do not use near water.
- Keep away from objects that might damage the device and assure that it is placed on a stable surface.
- Only use the power adapter / cords and connection cables designed for this unit.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power from the device before cleaning.

1.2 Introduction

The PT-E-HD50 HDMI over Single Cat.X Extender with HDBaseT, RS232, Bi-directional IR, Ethernet & POC boosts up your video/audio transmission distance to up to 80m / 100m (330ft) for resolutions up to 4K@30Hz or FullHD / 1080p with 48-bit color depth.

The PT-E-HD50 also supports 3D video formats, compliant with the HDMI specifications and therefore guarantees a great 3D video compatibility. With only one cost effective Cat.5 / 5e / 6 cable, users can easily extend the transmission distance of HDTV sources from DVD / Bluray players, PlayStation / Xbox, PC and any other kind of source, compliant with TMDS using HDMI or DVI to distant TVs or LCD PC monitors.

With the advanced design for the latest HDMI technology, deep color video, DTS-HD and Dolby TrueHD audio, HDCP support and compatibility are featured. This flexibility makes HDCP compliant devices transmit high quality video and audio in a greater distance at minimum costs, especially when integrating several components apart.

In addition, PT-E-HD50 is also equipped with a bi-directional IR pass-through path and a RS-232 serial port control. These bonus features allow users to boost their IR control distance for remote controls up to 100m (330ft) and make IR control possible through only one single Cat.5 / 5e / 6 cable, including the A/V signal. In addition, the serial port offers a convenient path for interactive applications, such as touch panels. In addition, PT-E-HD50 also supports PoC (Power over Cable) which can power both units (Tx / Rx) with one single power supply.

The PT-E-HD50 includes two units: Transmitting unit PT-E-HD50-TX and receiving unit PT-E-HD50-RX. The transmitter is used to capture the input HDMI / DVI signals and IR control packets. The receiving unit is responsible for equalizing the transmitted A/V signal and reconstructing IR and serial control signals. PT-E-HD50 offers the most convenient solution for digital signage with long distance A/V transmissions. With 10G transmission bandwidth, PT-E-HD50 is ready for your next-generation HDMI applications!

- Supports HDMI Deep Color, Full 3D & 4K2K@30 (HDBaseT technology)
- Extends the transmission to up to 100m (330ft) from the HDMI source at FullHD / 1080p 48-bit and 80m (264ft) at 4K2K@30
- Supports PoC (Power over Cable) which can power both units with just one power supply
- HDCP & EDID bypass
- CEC support
- Auto equalization
- Uncompressed 7.1ch digital audio over Cat.5 / 5e / 6 cable transmission
- „DTS-HD Master Audio“ and „Dolby TrueHD“ high bitrate audio support
- Supports and forwards full frequency IR signals from 20KHz to 60KHz
- Bi-directional IR controls
- Full-Duplex RS-232 control up to 115,200 bps
- 2 integrated LAN / network ports on both devices to forward Ethernet signals
- Wall mountable housing for easy and robust installation

1.3 Package Contents

Before installation, please check the package content and ensure that you have received all parts according to the component checklist prior to installation.

- 1x PT-E-HD50 [TX & RX]
- 1x IR blaster
- 1x IR receiver
- 1x DC 24V
- 1x User's Guide

1.4 Panel Descriptions

PT-E-HD50 front panel, transmitter (Tx)

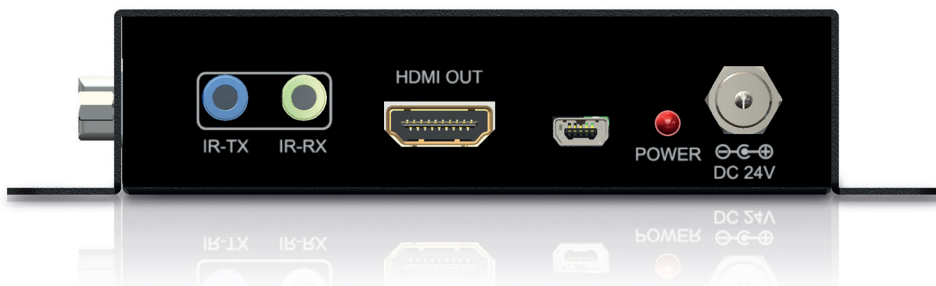


- RJ45: Plug in a Cat-5/5e/6 cable that needs to be linked to the transmitting unit RX
- LED: TX /RX link indicator
- 2x Ethernet ports: Connect to network devices (bi-directional) to forward the signal

DIP Switches

- PIN#1: Setup the RS-232 mode for serial communication channel
- PIN#2: For firmware updates
- RS-232: Connect to serial port device with a DSUB-9 male-male or male-female cable

PT-E-HD50 rear panel of transmitter (Tx)



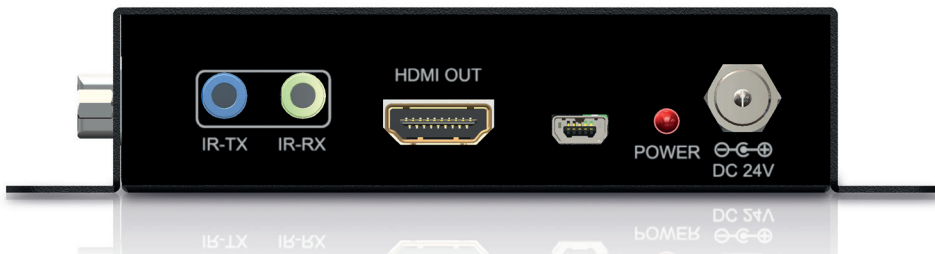
- IR Blaster: Infrared 3.5mm socket for plugging in the extension cable of IR blaster
- IR Receiver: Infrared 3.5mm socket for plugging in the extension cable of IR receiver
- HDMI IN: Connects to an HDMI source with a HDMI male-male cable
- Mini-USB: For firmware updates
- LED: Power indicator
- +24V DC: Connect to a 24V DC power supply

PT-E-HD50 front panel, receiver (Rx)



- RJ45: Plug in a Cat.5 / 5e / 6 cable and link it to the transmitting unit
- LED: TX /RX link indicator
- 2x Ethernet ports: Connect to network devices (bi-directional) to forward the signal
- DIP Switches:
 - PIN#1: Setup the RS-232 mode for serial communication channel
 - PIN#2: For firmware updates
 - RS-232: Connect to serial port device with a DSUB-9 male-male or male-female cable

PT-E-HD50 back panel, receiver (Rx)



- IR Blaster: Infrared 3.5mm socket for plugging in the extension cable of IR blaster
- IR Receiver: Infrared 3.5mm socket for plugging in the extension cable of IR receiver
- HDMI OUT: Connects to a HDMI display with an HDMI male-male cable
- LED: Power indicator
- +24V DC: Connect to a 24V DC power supply

DIP Switch Position (TX/RX)

DIP Switch Position		Description
TX & RX		
PIN#1	ON [↓]	TxD: The 2nd pin of RS-232, which is in charge of sending data RxD: The 3rd pin of RS-232, which is in charge of receiving data
	OFF [↑]	TxD: The 3rd pin of RS-232, which is in charge of sending data RxD: The 2nd pin of RS-232, which is in charge of receiving data
PIN#2	ON [↓]	Firmware Update
	OFF [↑]	Normal

1.5 IR Pass-Through

IR Extenders

IR Blaster



IR Receiver



IR Sockets

IR Blaster:

Plug in the IR blaster to emit all IR command signals received from the IR receiver from the other end to control the devices corresponding to the IR signals.

IR Receiver:

Plug in the IR receiver to receive all IR command signals from the IR remote controls of the corresponding devices.

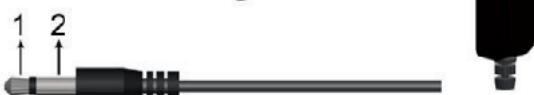


CAUTION

Incorrect placement of IR Blaster and Receiver may result in the failure of the IR extenders. Please check carefully before plugging in the IR extenders to the respective IR sockets. Warranty will not cover the damage.

Definition of IR Earphone Jack

1. IR Signal
2. Grounding



IR Blaster

1. IR Signal [20-60 kHz]
2. Grounding
3. Power

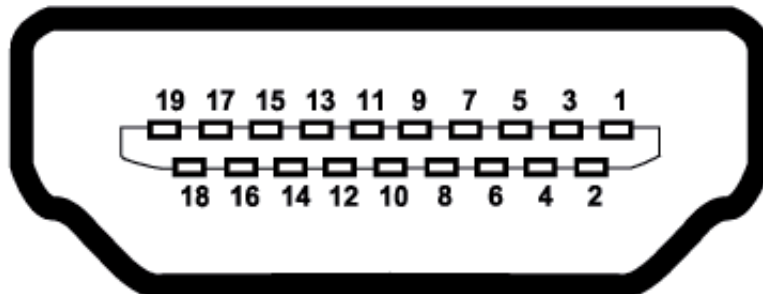


IR Receiver



You can use any IR extension cable that is compatible to the definition of the IR sockets for the matrix, e. g. for replacement use. However, IR cables longer than 2m (6 ft) may not work.

1.6 HDMI PIN Definition



Type A (Receptacle) HDMI			
Pin 1	TMDS Data2+	Pin 11	TMDS Clock Shield
Pin 2	TMDS Data2 Shield	Pin 12	TMDS Clock-
Pin 3	TMDS Data2-	Pin 13	NC
Pin 4	TMDS Data1+	Pin 14	Reserved (N.C. on device)
Pin 5	TMDS Data1 Shield	Pin 15	SCL
Pin 6	TMDS Data1-	Pin 16	SDA
Pin 7	TMDS Data0+	Pin 17	DDC/CEC Ground
Pin 8	TMDS Data0 Shield	Pin 18	+5V Power
Pin 9	TMDS Data0-	Pin 19	Hot Plug Detect
Pin 10	TMDS Clock+		

1.7 Installation

1. Connect an HDMI or DVI source (such as a BluRay Disc player) to the transmitting unit PT-E-HD50-TX.
2. Connect an HDMI or DVI display (such as a LCD TV) to the receiving unit PT-E-HD50-RX.
3. Connect IR Blaster/Receiver to both TX and RX units.
4. Connect the USB cable to a PC/Laptop.
5. Connect a Cat.5 / 5e / 6 cable between the transmitting and receiving units.
6. Make sure this Cat.5 / 5e / 6 cable is tightly connected and not loose.
7. Plug in 24V DC power supply unit to the power jack of the transmitting unit PT-E-HD50-TX.

Section 2: Software

1. Introduction

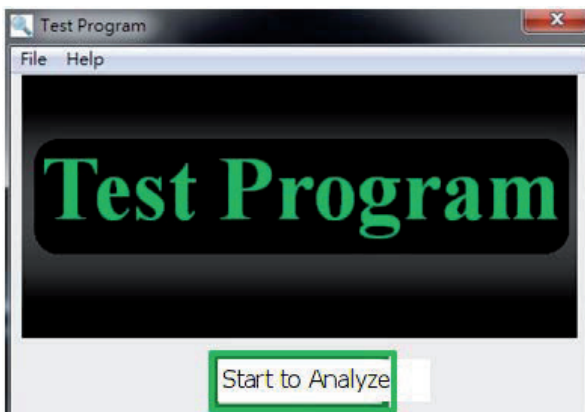
What is HDBaseT Manager?

HDBaseT Manager is a specialized software, focusing on detecting the connection environment and providing on-site testing possibilities to find potential problems efficiently and easily.

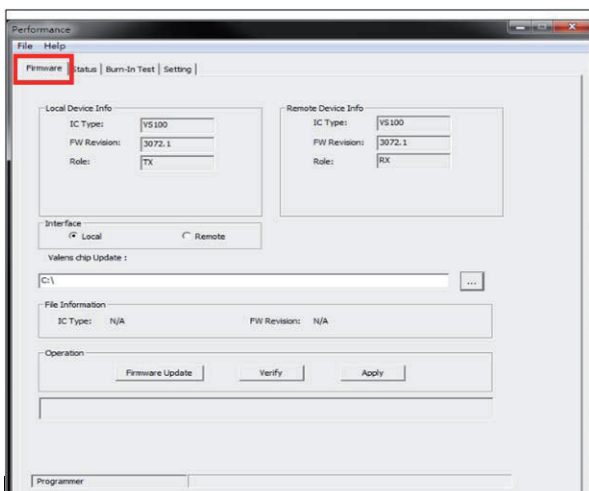
How does HDBaseT Manager help?

HDBaseT Manager offers service in 4 parts

- **Firmware:** Quickly understand the firmware version and update the firmware by yourself.
- **Status:** Easily know the status and environment of a connection condition.
- **Burn-In Test:** Allow the engineer or installer to get a technical file that reveals accurate data for unusual situation installations.

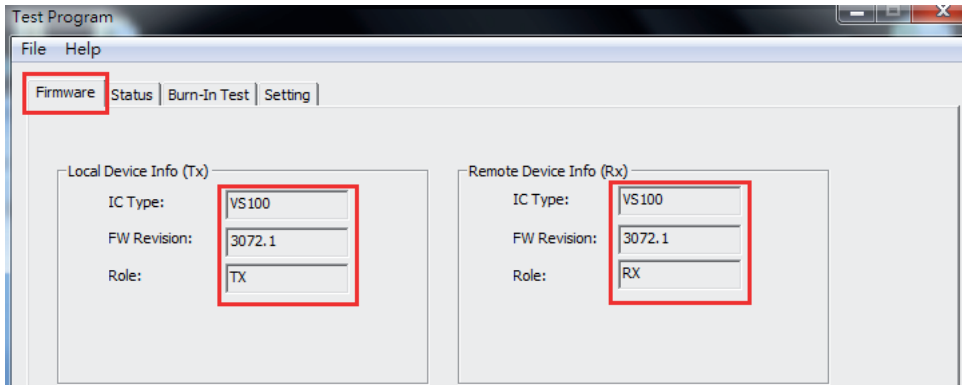


2. Firmware



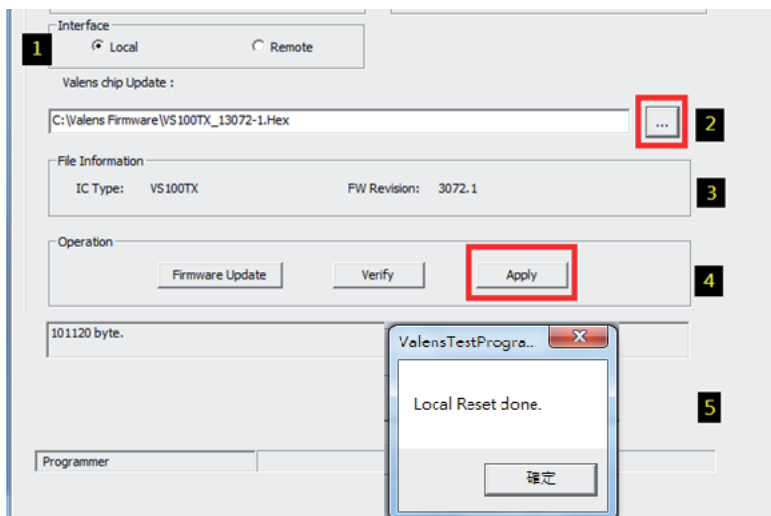
2.1 Check the current firmware version

The upper part reveals the IC type / firmware version on the TX and RX units.



2.2 Update the required firmware

In the lower parts you will see the information as shown



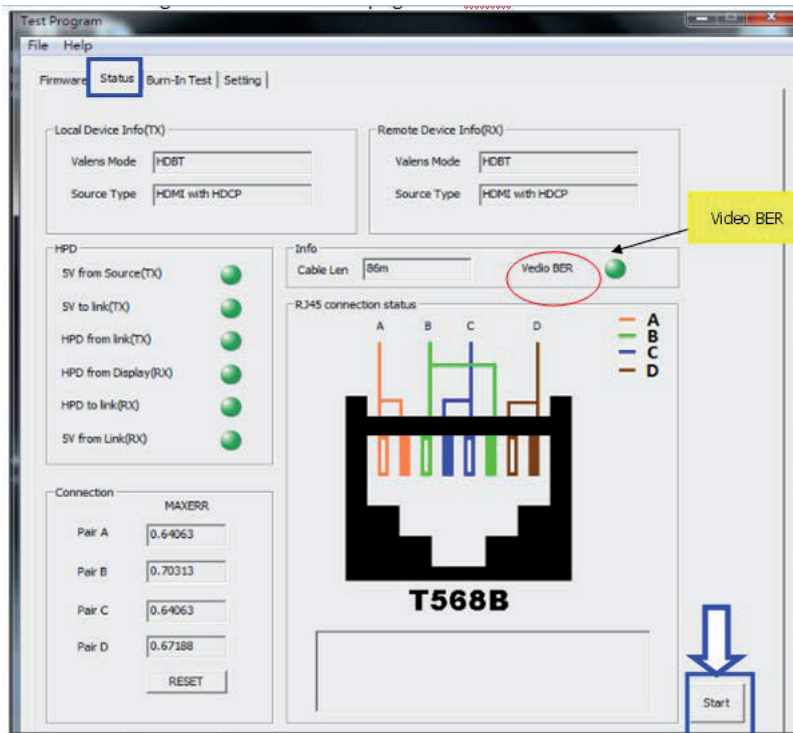
2.3 Whenever you want to update the firmware, follow these steps:

Step	Action
1	Select local (TX) or remote (RX) device for firmware update
2	Select the firmware file from your PC
3	Review the file information of the selected firmware
4	Select „Apply“ to get firmware updated and verified at the same time

3. Status (Connecting)

Note: The setting will affect the status page and burn-in test function to work

3.1 Push „Start“ in the corner to get the connection's information

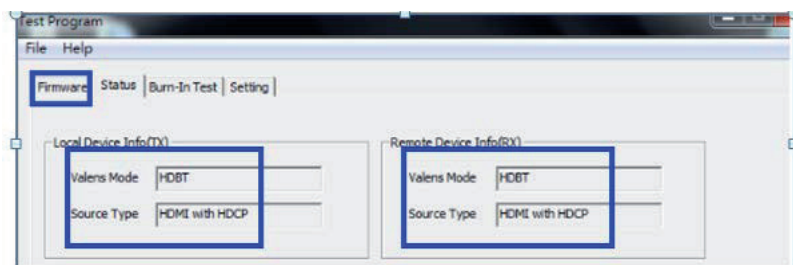


4. Check the connection status

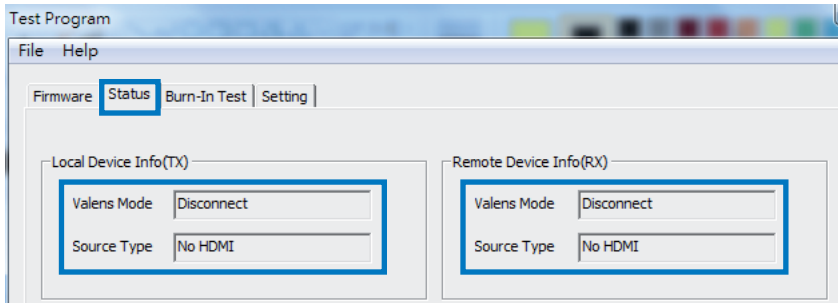
4.1 In the upper part, it will show the mode and source type

4.2 If connected successfully, you will see this as below:

Normal



If it fails to connect, you will get the status prompt as below:

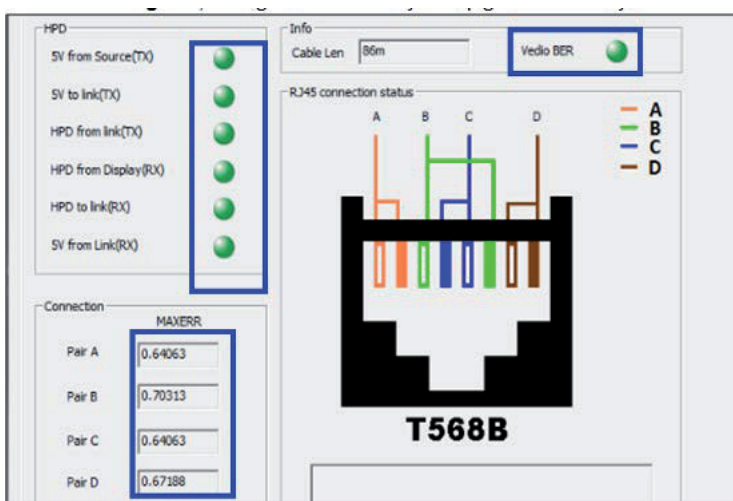


4.3 Indication to recognize the connection's condition

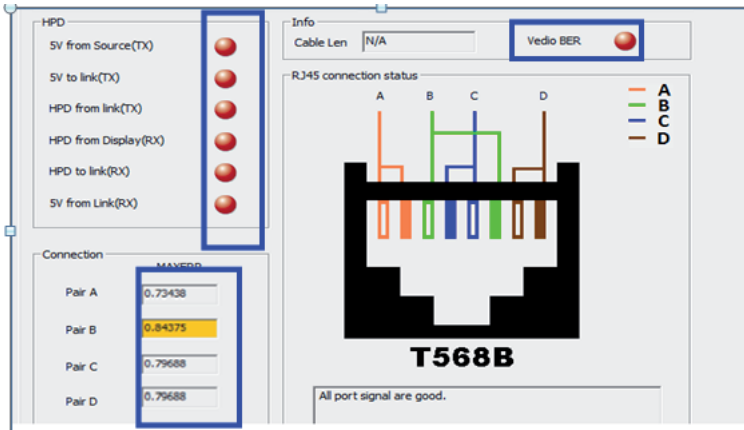
To review the status of the connection, HDBaseT Manager analyzes in 4 ways

Step	Item	What is this for?
1	HPD	Hot Plug Detect when you plug in or unplug incl. re-initializing the HDMI link if necessary
2	Cable len	To measure the cable length
3	Video BER	Bit Errors compared to transferred bits during a fix time interval (video bit error rate)
4	MAXERR	MAXERR is used to find the largest error between the samples of the original signal and the reconstructed signal

If the status is good, the LED should always keep lighting green without yellow or red.



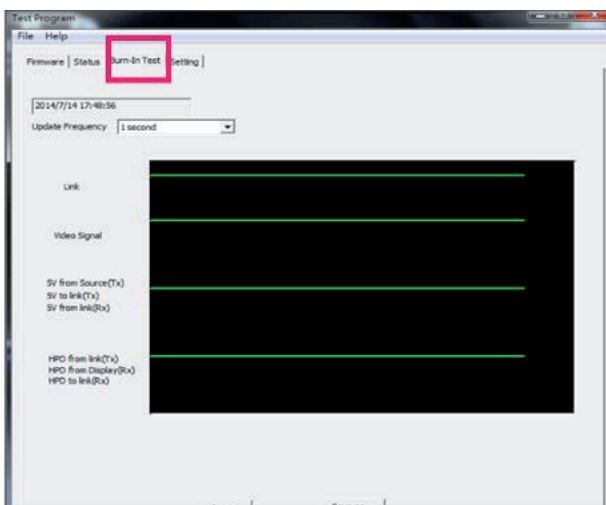
If the status is poor, the light will turn to yellow or red.



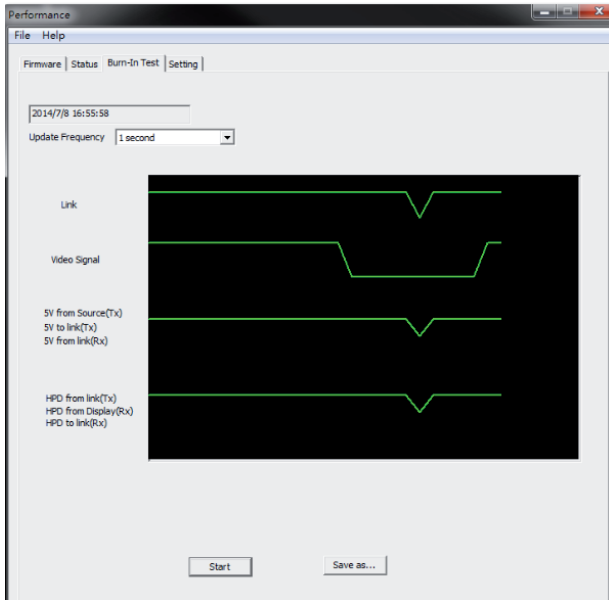
5. Burn-In Test

5.1 Get all technical info to analyze any unusual situation

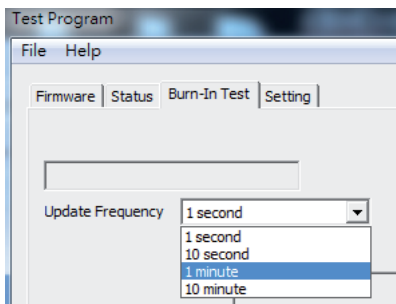
If the connection is fine, the graphs will stay straight all the time.



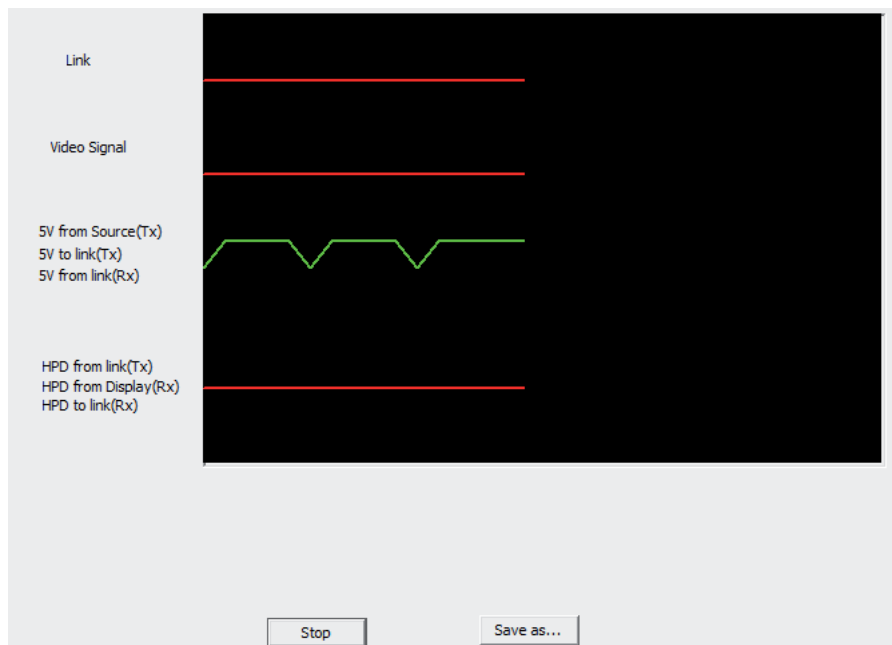
5.2 If there are errors detected, you will see graph-drops, as shown below



5.3 Select the required polling period and push „Start“ to get the data



5.4 Select „Save as...“ and send the file to the engineer for analyzing

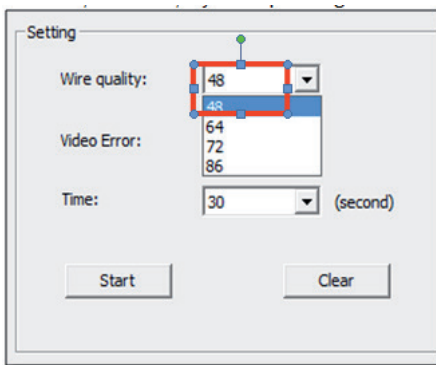


6. Fail-Safe Setting

Setting & saving the setting into the on-board MCU to ensure transmission stability.

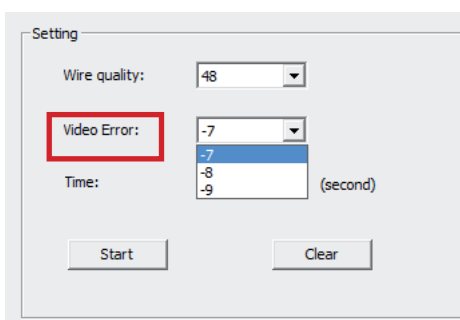
6.1 Due to these manual settings, the device will be able to reset, once the selected conditions are fulfilled at the same time. This will ensure a steady quality and stability for signal transmissions.

6.2 Sensitivity for fail-safe mechanism.

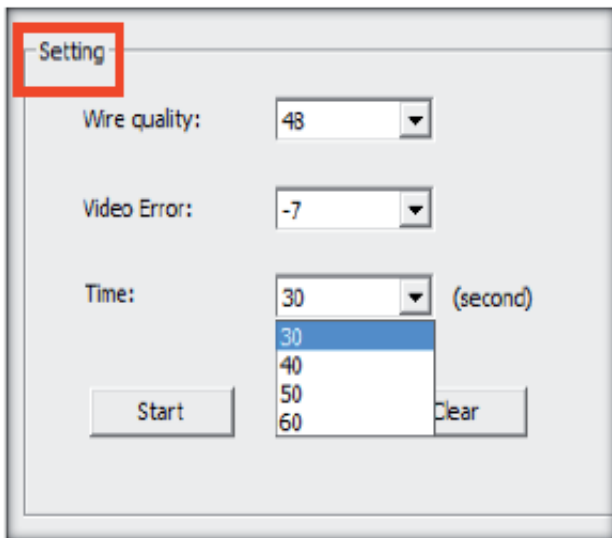


6.3 Quality of wire, please choose 48, vice versa

6.4 Select the standard video error rate tolerance. According to the HDMI association, the tolerance of bit errors in the transmission should be less than 10⁻⁹. -9 is set as standard. If you want to ignore more transmission errors, please choose -8 as standard.



6.5 Select the time interval. The PT-E-HD50 will detect the factors every 0.5 second by itself. If the problems regarding wire quality and video error rate last as long as the set time interval, the device will reset automatically to ensure a good quality signal transmission. When you choose 30s, it means once the errors last for 30s non-stop, the machine will reset immediately.



We suggest following combination for standard usage:

Wire Quality: 64
Video Error: -8
Time: 30 seconds

6.6 Push „Start“ to finish the setting.

Section 3: Specifications

Item	TX	RX
Units	Transmitting unit of PT-E-HD50	Receiving unit of PT-E-HD50
Unit Description	Transmitter	Receiver
HDMI compliance	HDMI Deep Color, full 3D & 4K2K@30/40m	
HDCP compliance	Yes	
Video bandwidth	Single-link 340MHz [10.2Gbps]	
Video support	480i / 480p / 720p / 1080i / 1080p60 / 4K@30	
HDMI over UTP	1080p@60 100m (330ft) [Cat.5e] / 4K@30 40m	
Audio support	Uncompressed up to 7.1ch or stereo digital audio	
Equalization	Auto	
Input TMDS signal	1.2 Volts [peak-to-peak]	
Input DDC signal	5 Volts [peak-to-peak, TTL]	
ESD protection	[1] Human body model — ±19kV [air-gap discharge] & ±12kV [contact discharge] [2] Core chipset — ±8kV	
PCB stack-up	6-layer board [impedance control — differential 100Ω; single 50Ω]	
IR pass-thru	Bi-directional	
RS-232 support	Yes	
POC support	Yes	
Input	1x HDMI 1x 3.5mm	1x RJ-45(Video) 1x 3.5mm
Output	1x RJ-45(Video) 1x 3.5mm	1x HDMI 1x 3.5mm
In / Out	1x RS-232 2x RJ-45(Ethernet)	1x RS-232 2x RJ-45(Ethernet)
HDMI source control	Controllable via IR pass-through from RX to TX with IR extenders	
HDMI connector	Type A [19-pin female]	
RJ45 connector	WE/SS 8P8C(Reverse Mode)	
Rotary switch	None	
3.5mm connector	IR receiver / IR blaster	IR receiver / IR blaster

Environmental

Item	
Mounting	Wall-mounting case with screws
Power supply	24V1A
Power consumption	Max 12W
Operating Temperature	0~50°C
Storage Temperature	-20~60°C [-4~140°F]
Relative Humidity	20~90% RH (no condensation)

Section 4: Notice

1. All HDMI over CAT5 transmission distances are measured using a CAT5e 125MHz UTP cable and a full-scale video signal generator.
2. Incorrect placement of the IR blaster and IR receiver may result in the failure of the IR extenders. Please check carefully before plugging in the IR extender to the respective IR sockets. Warranty will not cover the damage.
3. The transmission length is largely affected by the type of Cat.5 / 5e / 6 cables, the type of HDMI source and the type of the connected display. The testing result shows, solid UTP cables (usually in the form of 300m [1,000ft] bulk cables) can transmit a lot longer signal than stranded UTP cables usually in the form of fixed length patch cords. A solid UTP Cat.5e cable shows longer transmission range than stranded STP Cat.6 cable. For long extension applications, solid UTP / STP cables are the only viable choice.
4. EIA/TIA-568-B termination (T568B) for Cat.5 / 5e / 6 cables is recommended for better performance.
5. To reduce the interference among the unshielded twisted pairs of wires in Cat.5 / 5e / 6 cables, use shielded STP cables to improve EMI problems, which is worsening with long transmission.
6. Because the quality of Cat.5 / 6 cables has a major effect on how long the transmission limit can be and how good the received picture quality is, the actual transmission range is subject to one's choice of Cat.5 / 5e / 6 cables. For desired resolutions greater than 1080p, a Cat-6 cable is recommended.
7. If your HDMI display has multiple HDMI inputs, it is found that the first HDMI input [HDMI input #1] generally can produce better transmission performance among all HDMI inputs.

Section 5: Warranty

The SELLER warrants the PT-E-HD50 HDMI over Single Cat.X Extender with HDBaseT, RS232, Bi-directional IR, Ethernet & POC being free from defects in the material and workmanship for 1 year from the date of purchase from an authorized dealer. Should this product fail to be in good working condition within the 1 year warranty period, the SELLER, at its option, must repair or replace the unit, provided that the unit has not been subjected to accident, disaster, abuse or any unauthorized modifications including static discharge and over-powering. This warranty is offered by the SELLER for its BUYER with direct transaction only. This warranty is void if the warranty seal on the metal housing is broken.

Units that fail under conditions, other than those covered, will be repaired at the current price at the time of repair. Such repairs are warranted for 90 days from the day of reshipment to the BUYER. If the unit is delivered by mail, the customer has to cover the insurance or otherwise assume the risk of loss or damage in transit. Under no circumstances a unit will be accepted without a valid return authorization number.

The warranty is in lieu of all other warranties expressed or implied. Without limitations, this includes any other implied warranty, suitability for the application or sale for any particular reason, all of which are expressly disclaimed.

A proof of sale is required in order to claim warranty. Customers are responsible for shipping charges to and from the SELLER. Cables and power adapters are limited to a 30 day warranty and must be free from any markings, scratches or any other modification.

The content of this manual has been carefully checked and is believed to be accurate. However, manufacturer and seller take no responsibility for any inaccuracies that may be contained in this manual. Manufacturer and seller will not be liable for direct, indirect, incidental, special or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. Also, the technical information, features, manual descriptions, specifications and all product related documents regarding the PT-E-HD50 are subject to change without further notice.

Asking for Assistance

Technical Support:

Phone: +49 5971 800299 - 0

Fax: +49 5971 800299 - 99

Technical Support Hours:

8:30 AM to 5:00 PM Monday thru Thursday

8:30 AM to 4:00 PM Friday

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