



MXC-4K888-HDT100A-KIT

4K 18Gbps 8x8 HDMI™ HDBaseT™ Matrix Kit

User Manual



Thank you for purchasing this product

For optimum performance and safety, please read these instructions carefully before connecting, operating or adjusting this product. Please keep this manual for future reference.

Surge protection device recommended

This product contains sensitive electrical components that may be damaged by electrical spikes, power surges, electrostatic discharge (ESD), lightning strikes or transients. The use of surge protection systems is highly recommended to protect and extend the life of your equipment.

Safety & performance notice

The transmission distances of HDMI over UTP Cat cables are measured using TE Connectivity 1427071-6

EIA TIA-568-B termination (T568B) of cables is essential for optimal performance.

Do not run the HDBaseT™ / Cat5e/6/6a cabling in close parallel proximity or close to mains power cables. This will minimize interference of the unshielded twisted pairs in the CAT5e/6 cable, which can cause problems with the signal transmission.

Only use the power supply supplied with the unit, or a PhD Solutions supplied replacement.

Do not disassemble any of the equipment. This will void the manufacturer's warranty.

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1. Introduction

The 18Gbps 8x8 HDMI™ & HDBaseT Matrix is designed to distribute eight HDMI™ source devices to up to sixteen displays. It features eight HDMI™ outputs, each mirrored to a corresponding HDBaseT output, allowing simultaneous transmission over both HDMI™ and CAT cable.

The system supports video resolutions up to 4K@60Hz (YUV 4:4:4). HDBaseT outputs 1–4 extend signals up to 40 m (131 ft) at 4K or 70 m (230 ft) at 1080p, while HDBaseT outputs 5–8 extend up to 70 m (230 ft) at 4K or 100 m (328 ft) at 1080p over a single CAT5e/6/7 cable.

The matrix includes full IR matrix and audio matrix functionality. With ARC support, audio from connected HDMI™ or HDBaseT displays can be routed back to coaxial or analogue audio outputs via Web GUI or ASCII control. It also supports audio de-embedding from HDMI™ source devices to both analogue (L/R) and coaxial outputs.

Bi-directional IR and RS-232 control are supported. At the matrix, IR operates in a one-to-one configuration, while at the HDBaseT receiver, IR follows the selected HDMI™ video route. RS-232 communication is fully bi-directional and supports one-to-one transmission. The unit features a front panel with an OLED display for easy status monitoring and control. Additional control options include front panel buttons, IR remote, RS-232, LAN, and Web GUI, providing flexible integration into any installation.

2. Features

- ☆ HDCP 2.2 and HDCP 1.4 compliant
- ☆ 8x HDMI™ inputs, 8x HDMI™ outputs and 8x HDBaseT mirrored outputs
- ☆ Video resolution up to 4K@60Hz 4:4:4, as specified in HDMI™ 2.0b
- ☆ HDMI™ ports support 18Gbps lossless uncompressed video bandwidth
- ☆ 18Gbps HDBaseT signal transmission (lossless compressed)
- ☆ 4K to 1080P downscaling
- ☆ Supports formats including Dolby Vision , HDR10+ and HLG
- ☆ HDBaseT video transmission distance over a single CAT 5e/6/7 cable:
 - Outputs 1-4: 131ft/40m (4K) or 230ft/70m (1080P)
 - Outputs 5-8: 230ft/70m (4K) or 328ft/100m (1080P)
- ☆ HDMI™ audio pass-through up to 7.1CH HD audio (LPCM, Dolby TrueHD and DTS-HD Master Audio)
- ☆ ARC support on local HDMI™ and HDBaseT outputs
- ☆ IR matrix and audio matrix switching
- ☆ Coaxial and L/R analogue audio de-embedding
- ☆ Advanced EDID management
- ☆ 24V PoC on all HDBaseT ports
- ☆ Control via front panel buttons, IR remote, RS-232, LAN, and Web GUI

3. Package Contents

- ① 1x 4K 18Gbps 8x8 HDMI™ HDBaseT™ Matrix Kit
- ② 4x HDBaseT Receivers (40m)
- ③ 4x HDBaseT Receivers (70m)
- ④ 1x Matrix IR Remote
- ⑤ 1x 100~240V AC 50/60Hz Power Cable
- ⑥ 1x RS-232 Serial Cable (1.5 meters, male to female head)
- ⑦ 16x 3-pin Phoenix Connectors
- ⑧ 9x IR Blaster Cables (1.5 meters)
- ⑨ 10x 20~60KHz IR Receiver Cables (1.5 meters)
- ⑩ 18x Mounting Ears (Matrix and Receiver)
- ⑪ 40x Machine Screws (Matrix and Receiver)
- ⑫ 1x User Manual

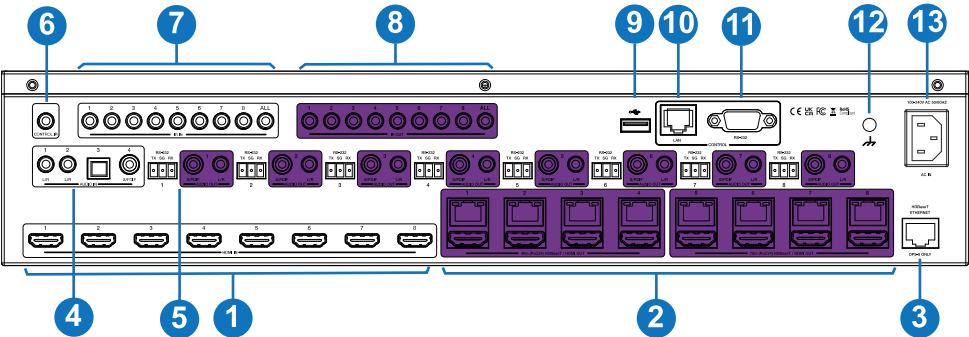
4. Specifications

Technical	
HDMI™ Compliance	HDMI™ 2.0b
HDCP Compliance	HDCP 2.2 and HDCP 1.4
Video Bandwidth	18Gbps
Video Resolution	640x480p60Hz, 800x600p60Hz, 1024x768p60Hz, 1280x1024p60Hz, 1360x768p60Hz, 1440x900p60Hz, 1440x1050p60Hz, 1600x1200p60Hz, 1920x1200p60Hz, 720x480i59.94Hz(480i59), 720x480p59.94Hz(480p59), 720x576i50Hz(576i50), 720x576p50Hz(576p50), 1280x720p50Hz(720p50), 1280x720p59.94Hz(720p59), 1280x720p60Hz(720p60), 1920x1080i50Hz(1080i50), 1920x1080i59.94Hz(1080i59), 1920x1080i60Hz(1080i60), 1920x1080p23.98Hz(1080p23), 1920x1080p24Hz(1080p24), 1920x1080p25Hz(1080p25), 1920x1080p29.97Hz(1080p29), 1920x1080p30Hz(1080p30), 1920x1080p50Hz(1080p50), 1920x1080p59.94Hz(1080p59), 1920x1080p60Hz(1080p60), 3840x2160p23.98Hz(2160p23), 3840x2160p24Hz(2160p24), 3840x2160p25Hz(2160p25), 3840x2160p29.97Hz(2160p29), 3840x2160p30Hz(2160p30), 3840x2160p50Hz(2160p50), 3840x2160p59.94Hz(2160p59), 3840x2160p60Hz(2160p60), 4096x2160p23.98Hz, 4096x2160p24Hz, 4096x2160p25Hz, 4096x2160p29.97Hz, 4096x2160p30Hz, 4096x2160p50Hz, 4096x2160p59.94Hz, 4096x2160p60Hz
Color Space	RGB, YCbCr 4:4:4/4:2:2/4:2:0
Color Depth	12-bit (4K), 16-bit (1080P)

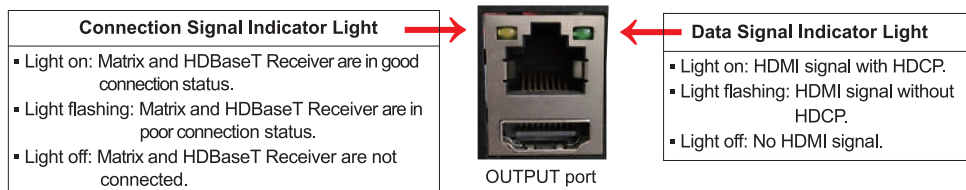
HDMI™ Audio Formats (Pass-through)	PCM 2.0/5.1/7.1CH, Dolby Digital/Plus/EX, Dolby True HD, DTS, DTS-EX, DTS-96/24, DTS High Res, DTS-HD Master Audio, DSD
Coax Audio Formats	PCM 2.0, Dolby Digital / Plus, DTS,
L/R Audio Formats	PCM 2.0
HDR Formats	4:4:4, 4:2:2, 4:2:0 (10,12bit deep color) HDR10, HDR10+, Dolby Vision, HLG
IR Level	5Vp-p
IR Frequency	Wideband 20KHz ~ 60KHz
ESD Protection	IEC 61000-4-2: ±8kV (Air-gap discharge) , ±4kV (Contact discharge)
Connection	
Matrix	
Input Ports	8× HDMI IN [HDMI™ Type A, 19-pin female] 10× IR IN [3.5mm Stereo Mini-jack] 2× L/R AUDIO IN [3.5mm Stereo Mini-jack B] 1× S/PDIF AUDIO IN (OPTICAL) 1× S/PDIF AUDIO IN (COAX) 1× TCP/IP [RJ45] 1× RS-232 [D-Sub 9]
Output Ports	8× HDMI OUT [HDMI™ Type A, 19-pin female] 8× HDBaseT OUT [RJ45] 9× IR OUT [3.5mm Stereo Mini-jack] 8× RS-232 [3-pin Phoenix connector] 8× S/PDIF AUDIO OUT (COAX) 8× L/R AUDIO OUT [3.5mm Stereo Mini-jack] 1× HDBaseT Ethernet [RJ45] 1× USB [USB Type A]
40m / 70m HDBaseT Receiver	
Input Ports	1× HDBaseT IN [RJ45] 1× IR IN [3.5mm Stereo Mini-jack] 1× S/PDIF IN (OPTICAL)
Output Ports	1× HDMI OUT [HDMI™ Type A, 19-pin female] 1× IR OUT [3.5mm Stereo Mini-jack]
Control Ports	1× SERVICE [Micro USB, Update port] 1× RS-232 [3pin Phoenix connector] 1× HDBaseT Ethernet [RJ45] (Note: The 40m HDBaseT Receiver has no HDBaseT Ethernet port.)
Mechanical	
Housing	Metal Enclosure
Color	Black

No.	Name	Function Description
4	Menu buttons (MENU / UP / DOWN / RIGHT / LEFT)	MENU: Press the MENU button to check/set the EDID, Baud rate, IP Address and DHCP mode. UP: Press the UP button to select the previous item. DOWN: Press the DOWN button to select the next item. RIGHT : Press the RIGHT button to confirm the operation and take effect. LEFT : Press and hold the LEFT button for 3 seconds to lock front panel buttons (except the Power button) ; Press the button again to unlock. The specific menu buttons operation is as following. ①EDID setting: On the initial OLED display screen, press “MENU” button to enter “Select EDID” interface, press “UP/DOWN” button to select the required EDID, and press the “RIGHT” button to enter “Copy To Input:” interface. Then press “UP/DOWN” button to select the input port you need to set, and press “RIGHT” button again to confirm. ②Baud rate setting: On the initial OLED display screen, press “MENU” button twice to enter “Select Baud” interface, and press “UP/DOWN” button to select the required Baud rate, finally press the “RIGHT” button to confirm the setting. ③IP Address Check: On the initial OLED display screen, press “MENU” button three times to enter the IP interface and check the current IP address. Besides, you can press “UP/DOWN” button to switch DHCP ON/OFF, finally press the “RIGHT” button to confirm the setting. Pressing the “MENU” button again will return to the initial OLED display status.
5	Power LED	When the product is on standby mode, the red power LED is on; Otherwise, the LED is off.
6	Power button	Press and hold the Power button for 3 seconds to enter the standby mode; Press it again briefly to wake the device.

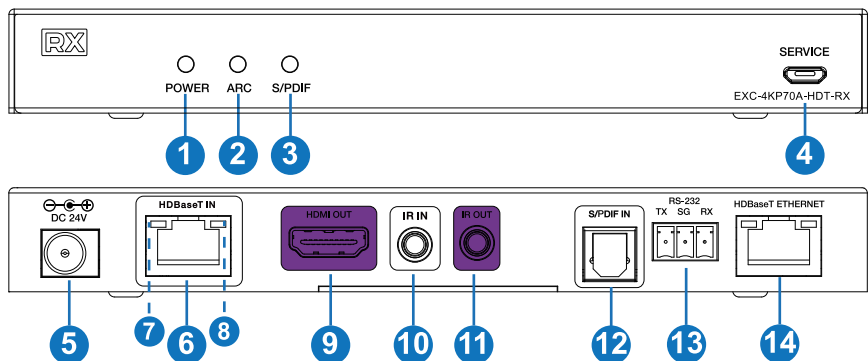
Rear Panel



No.	Name	Function Description
1	HDMI IN ports (1-8)	HDMI signal input ports for connecting source devices such as set-top boxes, media streaming devices, or gaming consoles via HDMI cable.
2	40m/70m HDBaseT / HDMI OUT ports (1-8)	HDBaseT ports, connected to HDBaseT Receiver via CAT cable. HDBaseT OUT 1-4 are connected to 40m HDBaseT Receivers; HDBaseT OUT 5-8 are connected to 70m HDBaseT Receivers; HDMI signal output ports, connected to HDMI display device such as TV or monitor with HDMI cable.
3	HDBaseT Ethernet port	This port supports network bridging. When connected to a router or switch, the LAN port on the 70 m HDBaseT receiver can provide internet access to connected devices (e.g. Smart TV, WAP or Media box).
4	AUDIO IN ports	L/R, optical and coaxial audio input ports, connected to external audio source device such as PC or DVD.
5	RS-232 port (1-8)	Connect to a PC or control system by 3-pin phoenix connector serial cable to transmit API commands between the Matrix and HDBaseT Receiver.
	S/PDIF port (1-8)	Coaxial audio output port, connected to audio output device such as audio amplifier via coaxial cable.
	L/R port (1-8)	Stereo analog audio output port, connected to amplifier or speaker via 3.5mm audio cable.
6	CONTROL IR port	IR signal input port. If unit's IR receiver is obstructed or installed out of line-of-sight, connect an IR receiver cable to the "CONTROL IR" port to receive remote control signals.
7	IR IN ports	Connect an IR receiver cable. The received IR signal will be transmitted to the "IR OUT" port of the HDBaseT receiver.
8	IR OUT ports	Connect an IR blaster cable, the emitted IR signal originates from the "IR IN" port of the HDBaseT Receiver.
9	USB port	USB external power port, only used for power supply, with a current limit of 500mA.
10	LAN port	This port is used for TCP/IP control, and connected to an active Ethernet network via an RJ45 cable.
11	RS-232 port	Connect to a PC or control system using a D-Sub 9-pin cable for API command control.
12	GND	Connect the unit chassis to an appropriate ground point.
13	POWER input	Connect to 100~240V AC 50/60Hz power supply.



5.2 HDBaseT Receiver (EXC-4KP70A-HDT-RX)

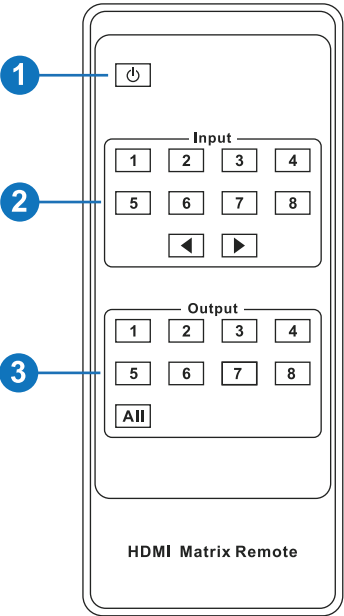


No.	Name	Function Description
1	POWER LED	Power LED indicator. The red LED illuminates when the device is powered.
2	ARC LED	The green ARC LED illuminates when ARC is enabled via the Web GUI or API Commands.
3	S/PDIF LED	When ARC is disabled via the Web GUI, the green S/PDIF LED is illuminated.
4	SERVICER port	Firmware update port
5	DC 24V	Connect the 24V DC power adapter to this port and plug the adapter into an AC wall outlet. Note: The HDBaseT OUT ports support PoC (Power over Cable). When connected to the matrix, the receiver does not require a separate power supply.
6	HDBaseT IN port	Connect to the HDBaseT OUT port of the Matrix with CAT cable.
7	Connection Signal Indicator Light (Green)	▪ Light on: Matrix and Receiver are connected and operating normally. ▪ Light flashing: Matrix and Receiver connection status is unstable. ▪ Light off: No connection between the Matrix and Receiver.
8	Data Signal Indicator Light (Orange)	▪ Light on: HDMI signal present with HDCP. ▪ Light flashing: HDMI signal present without HDCP. ▪ Light off: No HDMI signal.
9	HDMI OUT port	HDMI signal output port with ARC support to and ARC compatible display.
10	IR IN	Connect an IR receiver cable. The received IR signal will be transmitted to the “IR OUT” port of the Matrix.
11	IR OUT	Connect an IR blaster cable, the IR emitted IR signal originates from the IR IN port of the Matrix.

No.	Name	Function Description
12	S/PDIF IN port	Optical (TOSLINK) audio input port for connection to an audio source device using an Optical (TOSLINK) cable.
13	RS-232 port	Connect to a PC or control system using a 3-pin phoenix connector cable for API command control to send RS-232 commands between the Receiver and Matrix.
14	HDBaseT Ethernet port	This port supports network bridging. When connected to a router or switch, the LAN port on the 70 m HDBaseT receiver can provide internet access to connected devices (e.g. Smart TV, WAP or Media box).

Note: The 40m HDBaseT receiver has the same port functionality as the 70m receiver, except it does not support HDBaseT Ethernet.

6. IR Remote



① **Power on or Standby:** Power on the matrix or place it in standby mode.

② **Input 1/2/3/4/5/6/7/8:** Select the input channel.
 ◀ ▶ : Select the previous or next input channel.

③ **Output 1/2/3/4/5/6/7/8:** Select the output channel.
All: Select all output channels simultaneously.

For example, when you press the “All” button and then press input “1” button, then the input “1” source will route to all the displays.

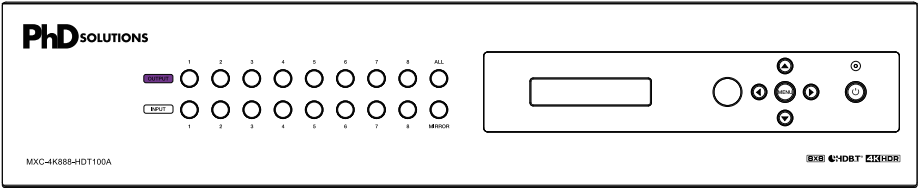
Operation instruction: Press the desired **Output** button first, then press the **Input** button to assign the source to the output.

Example:
 Press **Output-X** (X= 1-8 or “All”)

Then press **Input-Y** (Y= 1-8)

You can select input and output channel using the IR remote. There are two ways to receive the IR remote signal.

1. The IR receiver window accepts signals from the IR remote. The maximum operating distance is 7 meters and the angle is 45°, as shown in the diagram below:



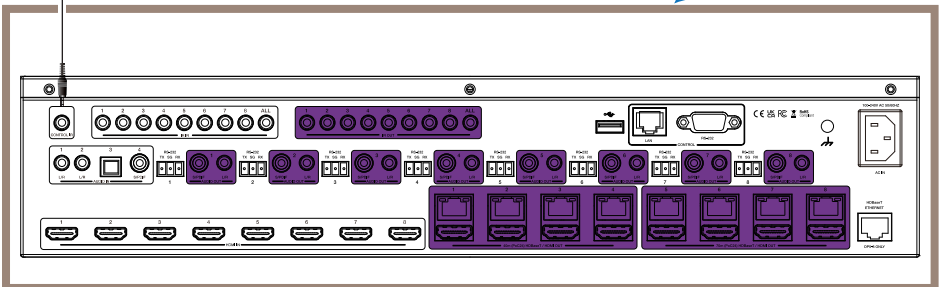
IR remote of the Matrix

2. If the IR receiver window of the Matrix is obstructed, the Matrix is installed in a closed environment or out of line of sight, connect an IR receiver cable to the “CONTROL IR” port of the matrix to receive the IR remote signals. The maximum operating distance of the IR remote is 7 meters, and the IR remote should be aimed directly at the IR receiver head, as shown in the diagram below.



IR remote of the Matrix

Machine Cabinet



7. IR Control System

This product functions as both a matrix switch and an extender and supports bi-directional IR control. When the matrix is connected to an HDBaseT receiver via CAT5e/6/7 cable, you can control either the remote display device or the source device using IR signal transmission. Please note that the IR routing differs depending on the direction—from the matrix (local) to the HDBaseT receiver (remote), and from the HDBaseT receiver (remote) back to the matrix (local).

At the Matrix end (Local end): IR signals are transmitted in a one-to-one configuration. This means the signal received at IR INPUT 1 is routed to the IR OUT port of HDBaseT Receiver 1, IR INPUT 2 to Receiver 2, and so on. The IR signal does not follow video switching. The IR INPUT ALL port will transmit to all HDBaseT receiver IR OUT ports simultaneously. Refer to the connection diagram below.

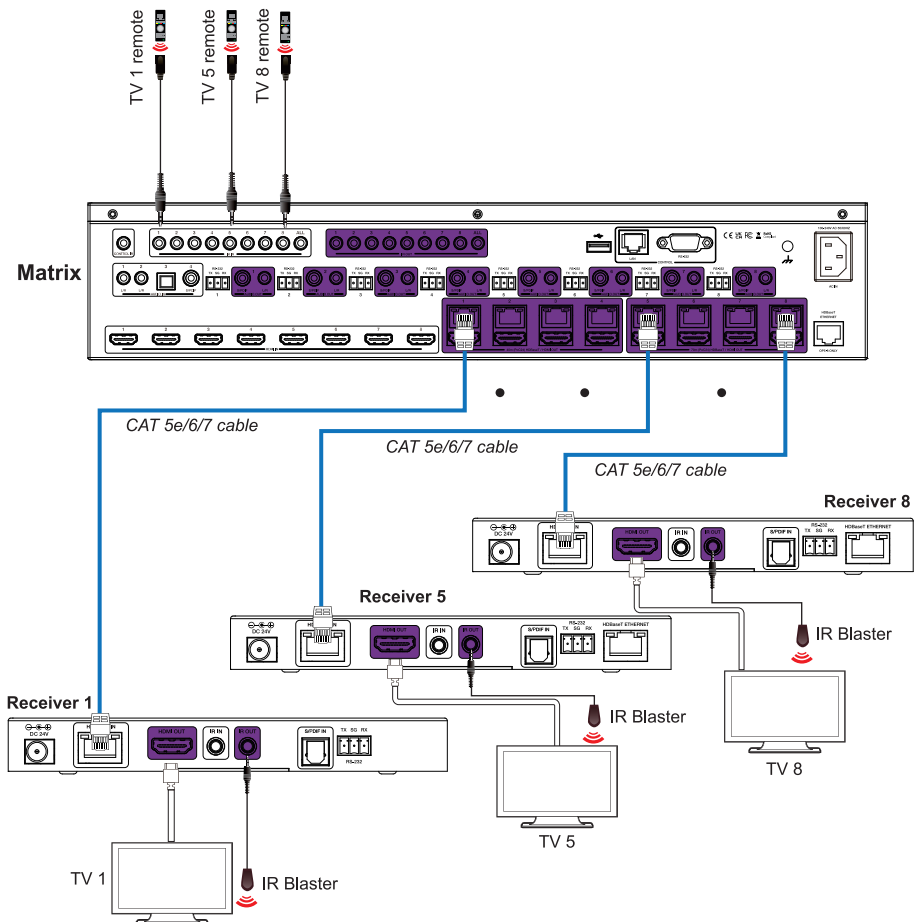


Figure 1: IR connection diagram (Matrix end)

At HDBaseT receiver (Remote end): IR signals follow the video routing. For example, if HDBaseT Receiver 1 is displaying HDMI input 3, the IR signal received at that receiver will be transmitted to IR OUTPUT 3 on the matrix. Similarly, if HDBaseT Receiver 3 is displaying HDMI input 6, its IR signal will be routed to IR OUTPUT 6 on the matrix. Any IR signal received at an HDBaseT receiver can also be output via the IR OUTPUT ALL port on the matrix. IR routing depends on the selected source and the IR remote used. Refer to the connection diagram below.

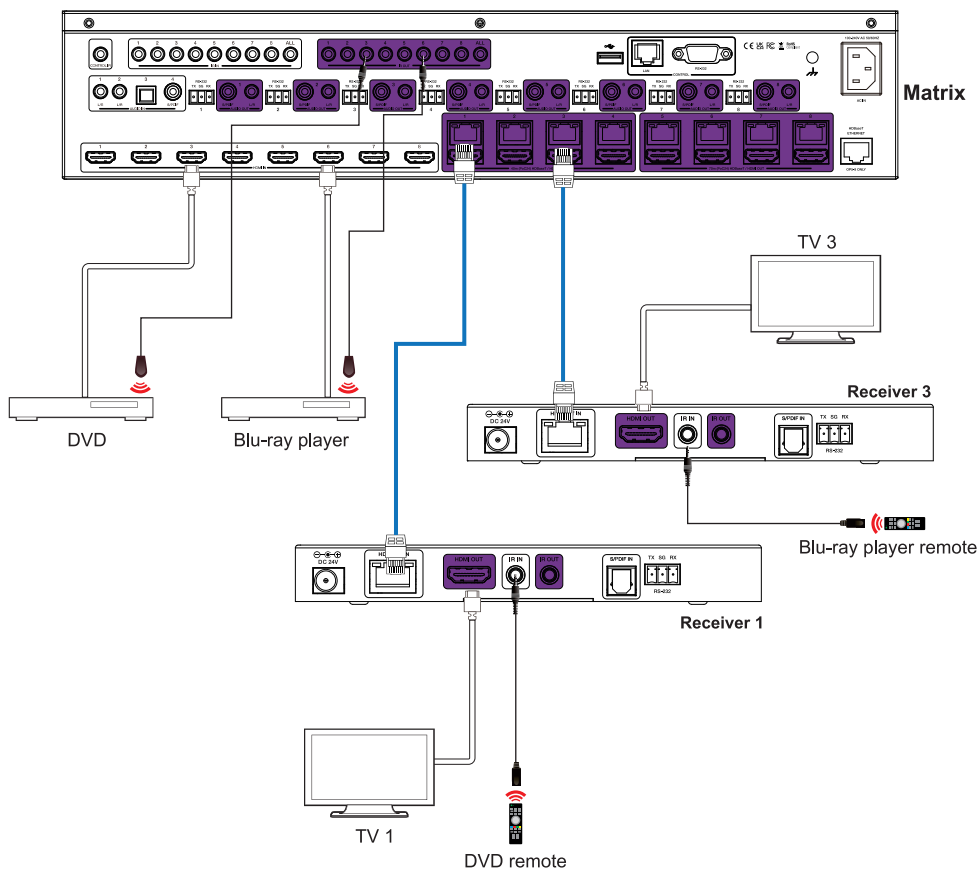
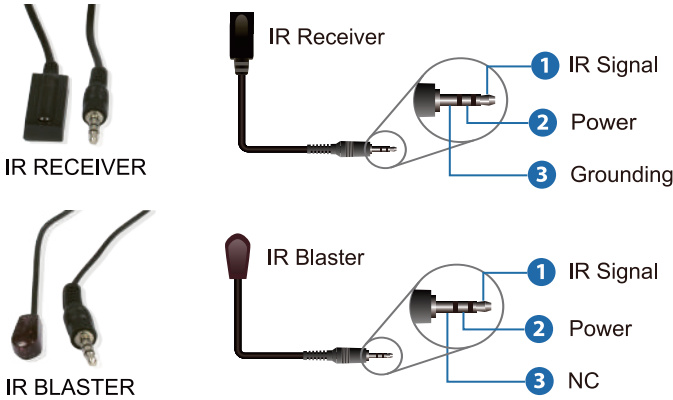


Figure 2: IR connection diagram (HDBaseT Receiver end)

8. IR Cable Pin Assignment



9. EDID Management

The matrix includes 21 factory-defined EDID settings, 2 user-defined EDID modes, and 16 copy EDID modes. EDID can be assigned to each input via the front panel, RS-232 commands, or the Web GUI.

Front Panel Operation:

From the main OLED display, press the MENU button to enter the EDID settings. Use the UP/DOWN buttons to select the desired EDID, then press RIGHT. When prompted with “Copy To Input:”, use UP/DOWN to select the required input port and press RIGHT again to confirm.

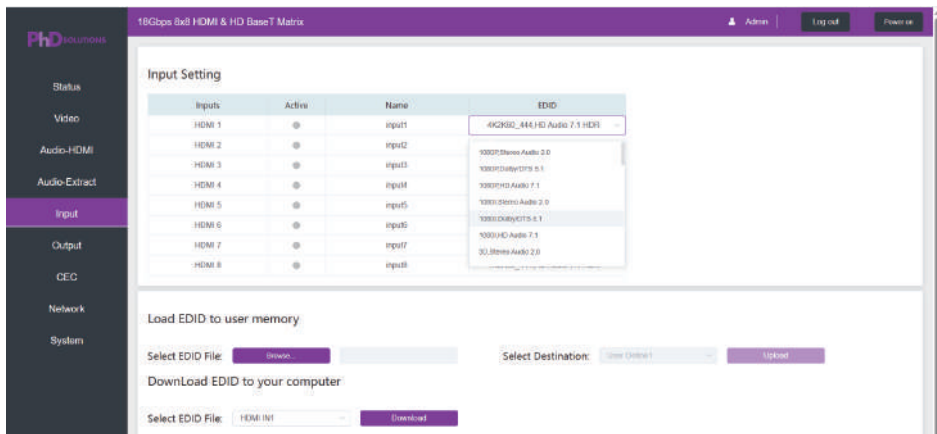
RS-232 Control:

Connect the matrix to a PC using a serial cable and send the ASCII command:
“s edid in x from z!”

Refer to “EDID Setting” in Section 12 (RS-232 Control Command) for full details.

Web GUI Operation:

EDID settings can be configured under the Input page in Section 11 (Web GUI User Guide)



The predefined EDID settings are listed below:

EDID Mode	EDID Description
1	1080p, Stereo Audio 2.0
2	1080p, Dolby/DTS 5.1
3	1080p, HD Audio 7.1
4	1080i, Stereo Audio 2.0
5	1080i, Dolby/DTS 5.1
6	1080i, HD Audio 7.1
7	3D, Stereo Audio 2.0
8	3D, Dolby/DTS 5.1
9	3D, HD Audio 7.1
10	4K2K30_444, Stereo Audio 2.0
11	4K2K30_444, Dolby/DTS 5.1
12	4K2K30_444, HD Audio 7.1
13	4K2K60_420, Stereo Audio 2.0
14	4K2K60_420, Dolby/DTS 5.1
15	4K2K60_420, HD Audio 7.1
16	4K2K60_444, Stereo Audio 2.0
17	4K2K60_444, Dolby/DTS 5.1
18	4K2K60_444, HD Audio 7.1
19	4K2K60, Stereo 2.0 HDR
20	4K2K60, Dolby/DTS 5.1 HDR
21	4K2K60, HD Audio 7.1HDR
22	User1
23	User2
24~31	Copy from HDMI output 1~8
32~39	Copy from HDBaseT output 1~8

10. Matrix Audio and RS-232 Introduction

The audio matrix supports 28 audio inputs and 16 audio outputs.

Audio inputs: 8x HDMI input audio, 8x HDMI ARC audio, 8x HDBaseT ARC audio, 2x analogue audio, 1x optical audio, 1x coaxial audio.

Audio outputs: 8x coaxial/analogue audio output (PCM supports both coaxial and analogue; multi-channel supports coaxial only), 8x HDMI embedded audio output.

Audio routing and settings can be configured via RS-232 or Web GUI.

RS-232 is one-to-one transmission.

Each matrix output RS-232 port corresponds to the same-numbered HDBaseT receiver (e.g. Output 1 → Receiver 1, Output 3 → Receiver 3). Refer to the connection diagram below.

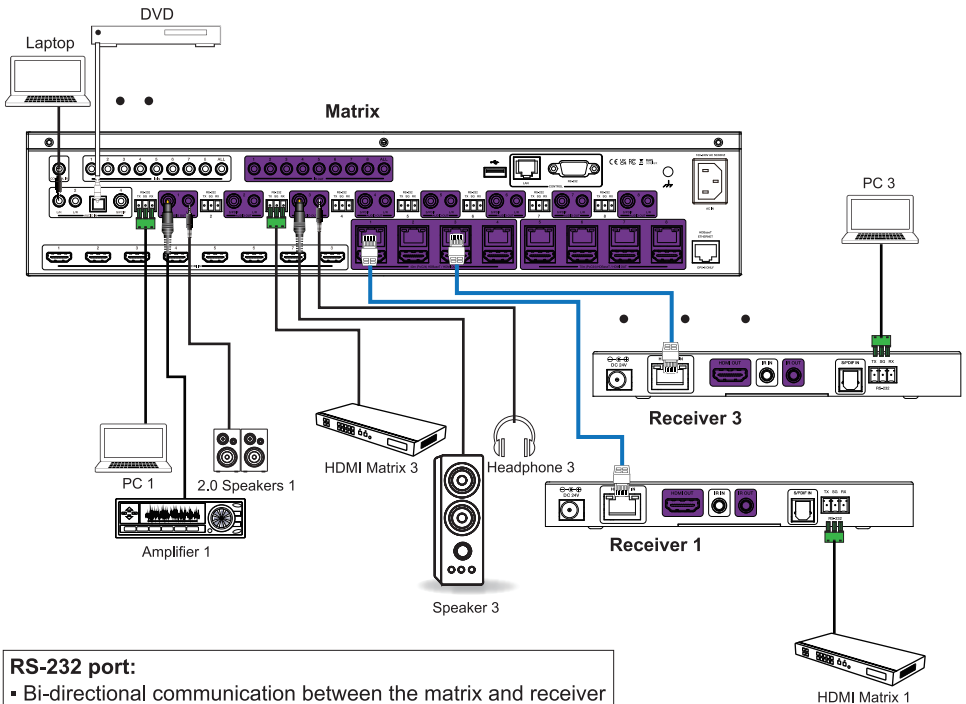


Figure 3: Audio and RS-232 connection diagram

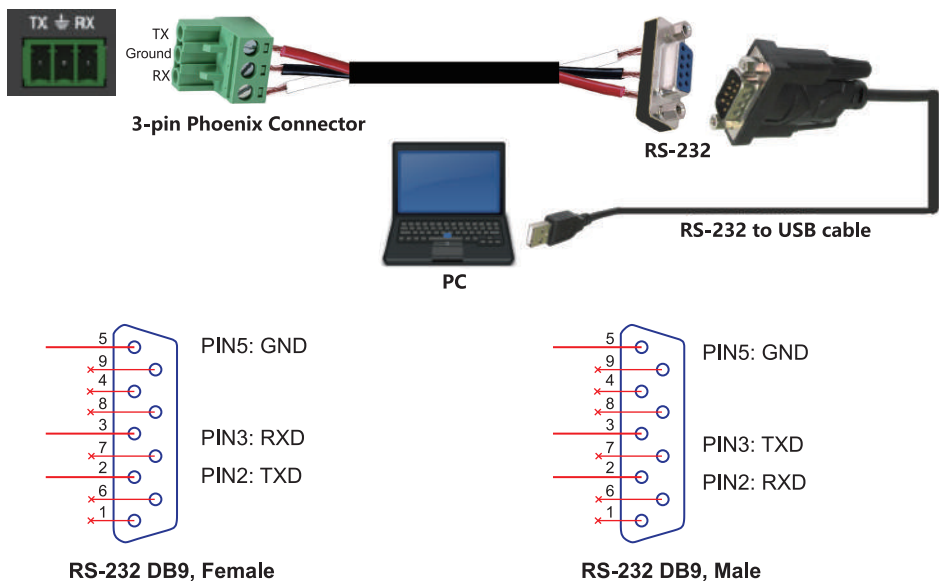


Figure 4: 3-pin phoenix connector to USB

11. Web GUI User Guide

The Matrix can be controlled by Web GUI as follows.

Step 1: Obtain the current IP Address.

The default IP address is **192.168.0.100**. The current Matrix IP address can be obtained in two ways:

- 1. Front panel:** On the OLED display, press MENU to enter the IP interface, then use UP/ DOWN to view the IP address
- 2: RS-232** Send the ASCII command "**r ipconfig!**" using a serial command tool to retrieve the IP address, as shown below.

```
IP Mode: DHCP
IP:192.168.62.109
Subnet Mask:255.255.255.0
Gateway:192.168.62.1
TCP/IP port:8000
Telnet port:23
Mac address:6c-df-fb-0c-b3-8e
```

The IP address shown above (e.g. 192.168.62.109) is the current IP of the matrix and may vary depending on the network configuration.

For details on RS-232 control, refer to **Section 12: RS-232 Control Command**.

Step 2: Connect the TCP/IP port of the matrix to a PC using a UTP cable, and ensure the PC is on the same network segment as the matrix.

Step 3: Enter the matrix IP address in a web browser on the PC to access the Web GUI login page, as shown below.



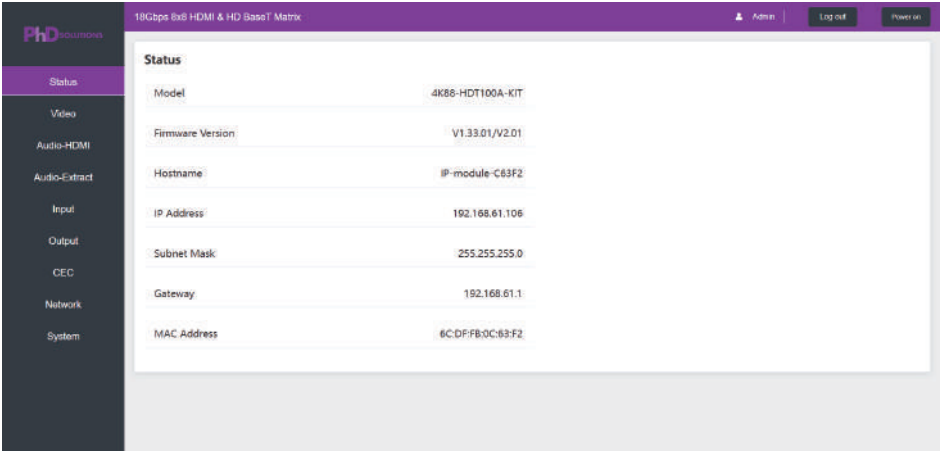
Select the Username from the list and enter the password. The default passwords are:

Username	User	Admin
Password	user	admin

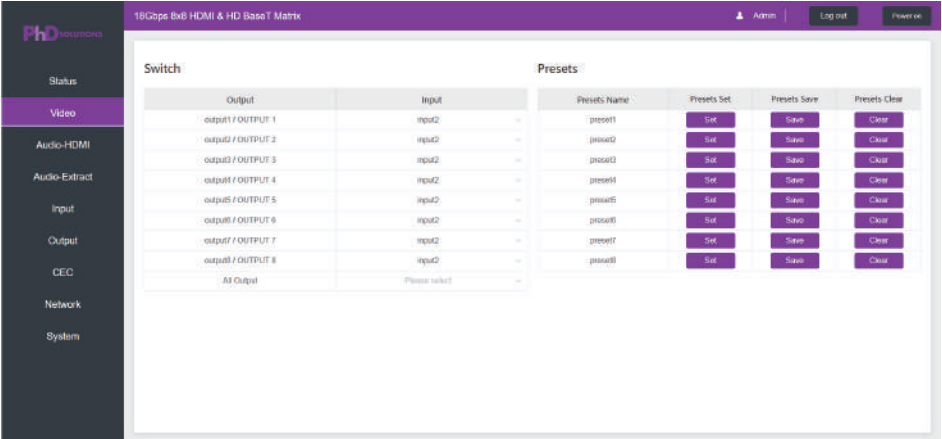
Enter the password and click “LOGIN” to access the Status page.

■ **Status Page**

The Status page displays basic device information, including the model, firmware version, hostname, and network configuration.



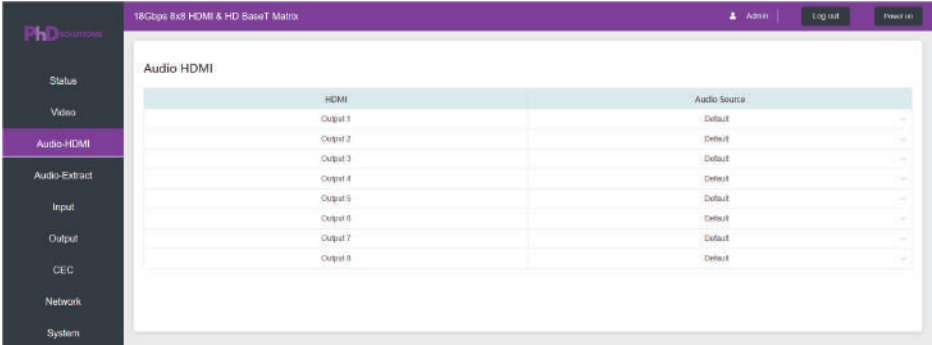
■ Video Page



The Video page allows you to perform the following operations:

- ① **Output:** The current device's output channel. You can select signal source from the drop-down menu.
- All Output:** Applies the selected source from the drop-down menu to all output channels.
- ② **Input:** Select the source for the selected output channel from the drop-down menu.
- ③ **Presets Name:** Enter a name for the current preset (maximum 12 characters; Chinese characters are not supported).
- ④ **Presets Set:** Click Set to recall the last saved audio/video routing.
- ⑤ **Presets Save:** Click Save to store the current audio/video routing.
- ⑥ **Presets Clear:** Click Clear to delete the saved audio/video routing.

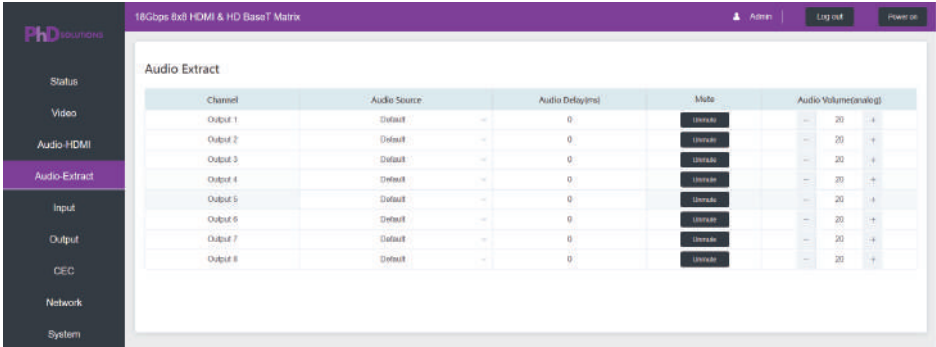
■ Audio-HDMI Page



The Audio-HDMI page allows you to perform the following operations:

- ① **HDMI:** Audio channel of the current output.
- ② **Audio Source:** The input source of the current audio channel. Select the input source for the current audio channel using the drop-down menu.

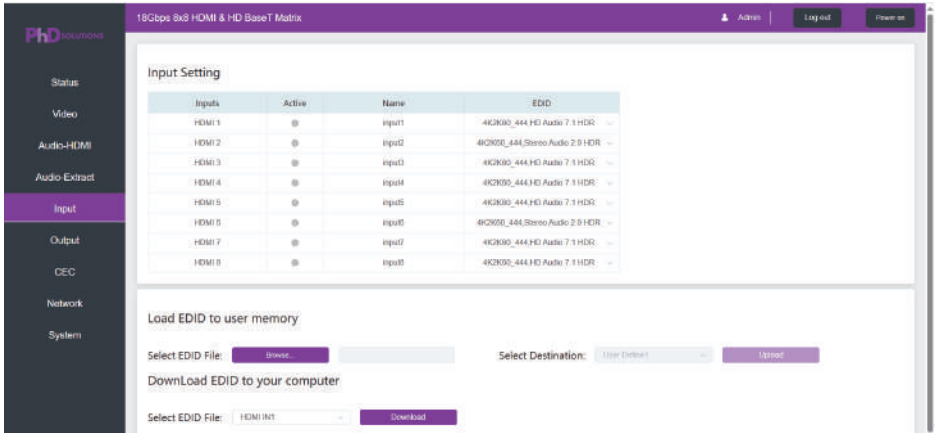
■ Audio-Extract Page



The Audio-Extract page allows you to perform the following operations:

- ① **Channel:** Audio output channel for coaxial audio or analog audio.
- ② **Audio Source:** Select the input source of the current audio channel using the drop-down menu.
- ③ **Audio Delay:** Set the output delay by entering a value (0 - 300) in the input field.
- ④ **Mute:** Click the button to mute / unmute the audio output channel.
- ⑤ **Audio Volume(Analog):** You can adjust the volume level (0-30) for the analog output channel by clicking “-” / “+” or by entering the value

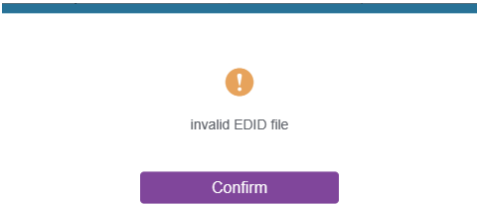
■ Input Page



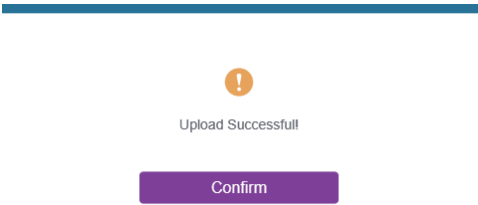
The Input page allows you to perform the following operations:

- ① **Inputs:** Input channel of the device.
- ② **Active:** It indicates whether the channel is connected to a signal source.
- ③ **Name:** The input channel name. Modify the name (max. 12 characters; Chinese characters are not supported).
- ④ **EDID:** Select the EDID for the current channel from the drop-down menu.
- ⑤ **Load EDID to user memory:** Set the user-defined EDID.

Click “Browse” and select the .bin file. If an incorrect EDID file is selected, a prompt will appear, as shown below:



Ensure the correct file is selected and verify the file name. Choose “User Define1” or “User Define2”, then click “Upload”. A confirmation message will appear once the upload is successful.



⑥ Download an EDID to your computer:

Select the input channel from the “Select EDID File” drop-down menu, then click “Download” to download the EDID file.

■ Output Page

PhD solutions

18Gbps Full HDMI & HD BaseT Matrix

Admin | Log out | Power on

Status

Video

Audio-HDMI

Audio-Extract

Input

Output

CEC

Network

System

Output Setting

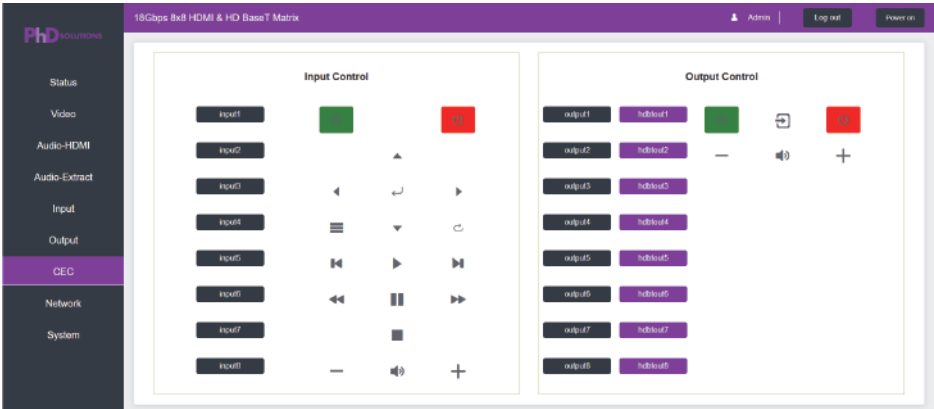
Outputs	Name	Type	Cable	Scaler Mode	ARC	Stream
Output 1	output1	HDMI	Ⓢ	Bypass	on	on
	hdmiout1	HDBT	Ⓢ	Bypass	on	on
Output 2	output2	HDMI	Ⓢ	Bypass	on	on
	hdmiout2	HDBT	Ⓢ	Bypass	on	on
Output 3	output3	HDMI	Ⓢ	Bypass	on	on
	hdmiout3	HDBT	Ⓢ	Bypass	on	on
Output 4	output4	HDMI	Ⓢ	Bypass	on	on
	hdmiout4	HDBT	Ⓢ	Bypass	on	on
Output 5	output5	HDMI	Ⓢ	Bypass	on	on
	hdmiout5	HDBT	Ⓢ	Bypass	on	on
Output 6	output6	HDMI	Ⓢ	Bypass	on	on
	hdmiout6	HDBT	Ⓢ	Bypass	on	on
Output 7	output7	HDMI	Ⓢ	Bypass	on	on
	hdmiout7	HDBT	Ⓢ	Bypass	on	on
Output 8	output8	HDMI	Ⓢ	Bypass	on	on
	hdmiout8	HDBT	Ⓢ	Bypass	on	on

The Output page allows you to perform the following operations:

- ① **Outputs:** Output channel of the device.
- ② **Name:** The current output channel name. Modify the name (max. 12 characters; Chinese characters are not supported)..
- ③ **Type:** The current output channel type (HDMI or HDBT).
- ④ **Cable:** Indicates the output channel connection status: green when connected to a display, grey when not connected.

- ⑤ **Scaler Mode:** Select the output resolution mode from the drop-down menu.
- ⑥ **ARC:** Enable or disable ARC. When enabled, HDMI ARC audio from the HDBaseT receiver is returned to the transceiver (Matrix); when disabled, S/PDIF audio is returned.
- ⑦ **Stream:** Turn on/off the output stream.

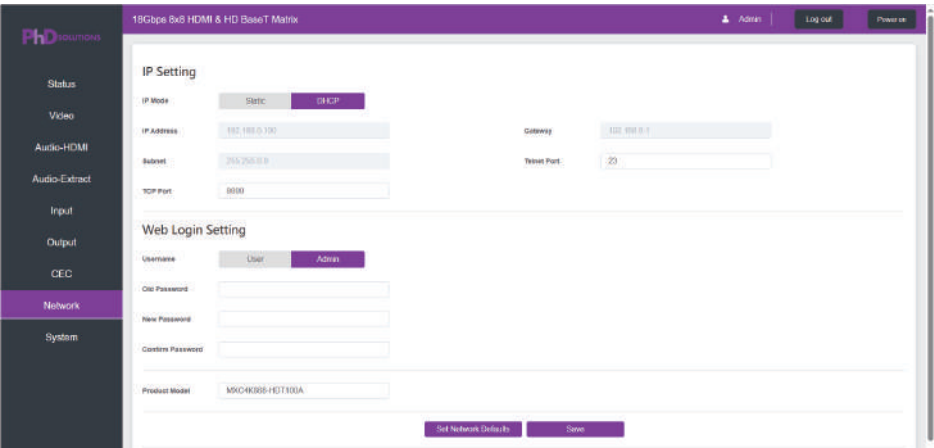
■ CEC Page



You can perform CEC management on this page:

- ① **Input Control:** You can control the operation of each input source by pressing the icons on the page.
- ② **Output Control:** You can control the operation of each display, such as power on/off, volume +/-, active source switching.

■ Network Page

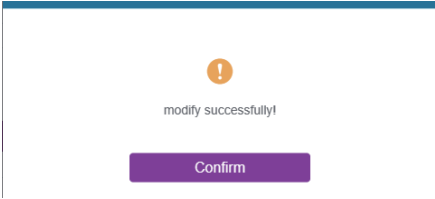


You perform the following operations on the Network page:

- ① **Modify Network Setting**
Set the IP Mode (Static/DHCP). In Static mode, manually configure the IP address, gateway, subnet, Telnet port, and TCP port, then click “Save” to apply. In DHCP mode, the IP address is assigned automatically by the router and cannot be modified.

② **Modify Web Login Password**

To change the Web GUI login password for the User/Admin account. Enter the current password, new password, and confirm password, then click “Save”. A confirmation message will appear once the password is successfully updated.

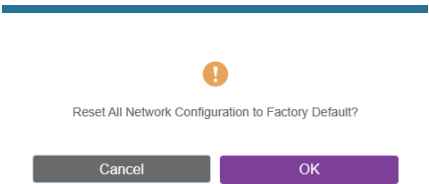


Note: Input rules for changing passwords:

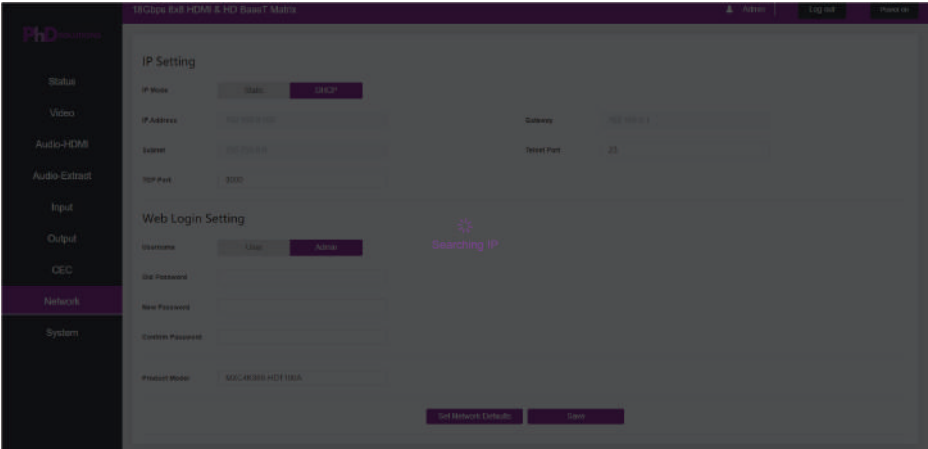
- (1) The password can't be empty.
- (2) New Password can't be the same as Old Password.
- (3) New Password and Confirm Password must be the same.

③ **Set the Default Network**

Click “Set Network Defaults” to restore network settings. A confirmation prompt will appear, as shown below.

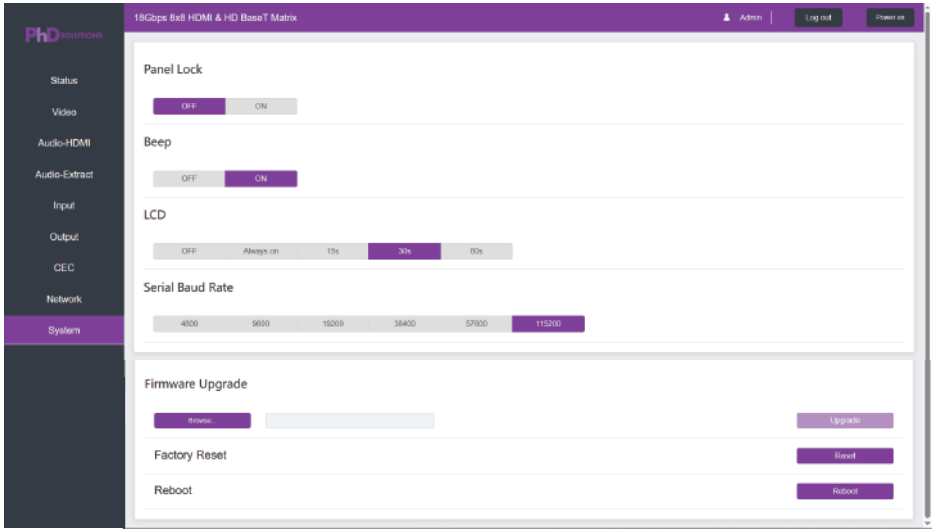


Click “OK” to search for the IP Address again, as shown below:



After the reset is complete, the system will return to the login page and the default network settings will be applied.

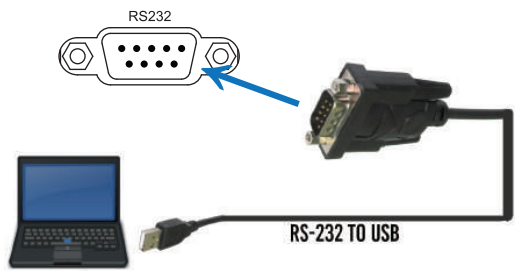
■ System Page



- ① **Panel Lock:** Click “ON/OFF” to lock or unlock panel buttons. “ON” disables the buttons; “OFF” enables them.
 - ② **Beep:** Click “ON/OFF” to enable or disable the beep.
 - ③ **LCD:** Click “OFF” to turn off the LCD display, or set the display timeout (Always on/15s/30s/60s).
 - ④ **Serial Baud Rate:** Click the value to set the Serial Baud Rate.
 - ⑤ **Firmware Update:** Click “Browse” to select the update file, then click “Update” to complete firmware update.
 - ⑥ **Factory Reset:** Click “Reset” to reset the matrix to factory defaults.
 - ⑦ **Reboot:** Click “Reboot” to reboot the matrix.
- Note:** After reset or reboot, the system will return to the login page.

12. RS-232 Control Command

The product also supports RS-232 control. Use a serial cable with RS-232 male head and DB9 transfer USB male head. The RS-232 head of the serial cable is connected to the RS-232 control port with DB9 at the rear of the Matrix, and the USB head of the serial cable is connected to a PC as shown below:



Open a serial command tool on the PC and send ASCII commands to control the Matrix. The command list is shown below.

ASCII Command				
Serial port protocol. Baud rate: 115200 (default), Data bits: 8bit, Stop bits:1, Check bit: 0 TCP/IP protocol port: 8000 TELNET protocol: port :23				
x, y, XXX are parameters.				
ASCII Command	Function Description	Example	Feedback	Default Setting
Power				
s power z!	Power on/off the device, z=0~1 (z=0 power off, z=1 power on)	s power 1!	Power on System Initializing... Initialization Finished! power off POWER 0	power on
r power!	Get current power state	r power!	power on/power off	
s reboot!	Reboot the device	s reboot!	Reboot... System Initializing... Initialization Finished! FW version 1.00.01	
System Setup				
help!	List all commands	help!		
r type!	Get device model	r type!	MXC4K888-HDT100A	
r status!	Get device current status	r status!	Get the unit all status: power, beep, lock, in/ out connection, video/ audio crosspoint, edid, scaler,hdc, network status	
r fw version!	Get Firmware version	r fw version!	MCU BOOT: V1.00.02 MCU APP: V1.00.01 WEB GUI: V1.01	

ASCII Command	Function Description	Example	Feedback	Default Setting
r link in x!	Get the connection status of the x input port, x=0~8 (0=all)	r link in 1!	hdmi input 1: connect	
r link out y!	Get the connection status of the y output port, y=0~8 (0=all)	r link out 1!	hdmi output 1: connect hdbt output 1: connect	
s reset!	Reset to factory defaults	s reset!	Reset to factory defaults System Initializing... Initialization Finished! FW version 1.00.01	
s beep z!	Enable/Disable buzzer function, z=0~1 (z=0 beep off, z=1 beep on)	s beep 1!	beep on beep off	beep on
r beep!	Get buzzer state	r beep!	beep on / beep off	
s lock z!	Lock/Unlock front panel button, z=0~1 (z=0 lock off, z=1 lock on)	s lock 1!	panel button lock on panel button lock off	panel button lock off
r lock!	Get panel button lock state	r lock!	panel button lock on/off	
s lcd on time z!	Set LCD screen remain on time, z=0~4 (0:off, 1:always on, 2:15s, 3:30s, 4:60s)	s lcd on time 1!	lcd on always	lcd on 30 seconds
r lcd mode!	Get the backlight status of lcd screen	r lcd mode!	lcd on always	
s save preset z!	Save switch state between all output port and the input port to preset z, z=1~8	s save preset 1!	save to preset 1	
s recall preset z!	Call saved preset z scenarios, z=1~8	s recall preset 1!	recall from preset 1	
s clear preset z!	Clear stored preset z scenarios, z=1~8	s clear preset 1!	clear preset 1	
r preset z!	Get preset z information, z=1~8	r preset 1!	video/audio crosspoint	
s ptp!		s ptp!	ptp	ptp
Output Setting				
s in x av out y!	Set input x to output y, x=1~8, y=0~8(0=all)	s in 1 av out 2!	input 1 -> output 2	input 1 -> output 1 input 2 -> output 2 input 3 -> output 3 input 4 -> output 4 input 5 -> output 5 input 6 -> output 6 input 7 -> output 7 input 8 -> output 8
r av out y!	Get output y signal status y=0~8 (0=all)	r av out 0!	input 1 -> output 1 input 2 -> output 2 input 7 -> output 7 input 8 -> output 8	
s hdmi y stream z!	Set hdmi output y stream on/off, y=0~8 (0=all) z=0~1 (0:disable, 1:enable)	s hdmi 1 stream 1! s hdmi 0 stream 1!	Enable hdmi output 1 stream Disable hdmi output 1 stream Enable hdmi all outputs stream Disable hdmi all outputs stream	Enable hdmi all outputs stream
r hdmi y stream!	Get hdmi output y stream status, y=0~8 (0=all)	r hdmi 1 stream!	Enable hdmi output 1 stream Disable hdmi output 1 stream	

ASCII Command	Function Description	Example	Feedback	Default Setting
s hdbt y stream z!	Set hdbt output y stream on/off, y=0~8 (0=all) z=0~1 (0:disable,1:enable)	s hdbt 1 stream 1! s hdbt 0 stream 1!	Enable hdbt output 1 stream Disable hdbt output 1 stream Enable hdbt all outputs stream Disable hdbt all outputs stream	Enable hdbt all outputs stream
r hdbt y stream!	Get hdbt output y stream status, y=0~8 (0=all)	r hdbt 1 stream!	Enable hdbt output 1 stream Disable hdbt output 1 stream	
s hdmi y scaler z!	Set hdmi output y port output scaler mode, y=0~8 (0=all), z=1~3 (1=bypass, 2=4k->1080p, 3=Auto)	s hdmi 1 scaler 1! s hdmi 0 scaler 1!	hdmi output 1 set to bypass mode hdmi all outputs set to bypass mode	hdmi all outputs set to bypass
r hdmi y scaler!	Get hdmi output y port output mode y=0~8 (0=all)	r hdmi 1 scaler!	hdmi output 1 set to bypass mode	
s hdbt y scaler z!	Set hdbt output x port output scaler mode, y=0~8 (0=all), z=1~3 (1=bypass, 2=4k->1080p, 3=Auto)	s hdbt 1 scaler 2! s hdbt 0 scaler 2!	hdbt output 1 set to 4k->1080p mode hdbt all outputs set to 4k->1080p mode	hdbt all outputs set to bypass
r hdbt y scaler !	Get hdbt output y port output scaler mode y=0~8 (0=all)	r hdbt 1 scaler !	hdbt output 1 set to 4k->1080p mode	
EDID Setting				
s edid in x from z!	Set input x EDID from default EDID z, x=0~8 (0=all), z=1~39 1=1080p,Stereo Audio 2.0 2=1080p,Dolby/DTS 5.1 3=1080p,HD Audio 7.1 4=1080i,Stereo Audio 2.0 5=1080i,Dolby/DTS 5.1 6=1080i,HD Audio 7.1 7=3D,Stereo Audio 2.0 8=3D,Dolby/DTS 5.1 9=3D,HD Audio 7.1 10=4K2K30_444,Stereo Audio 2.0 11=4K2K30_444,Dolby/DTS 5.1 12=4K2K30_444,HD Audio 7.1 13=4K2K60_420,Stereo Audio 2.0 14=4K2K60_420,Dolby/DTS 5.1 15=4K2K60_420,HD Audio 7.1 16=4K2K60_444,Stereo Audio 2.0 17=4K2K60_444,Dolby/DTS 5.1 18=4K2K60_444,HD Audio 7.1 19=4K2K60_444,Stereo Audio 2.0 HDR 20=4K2K60_444,Dolby/DTS 5.1 HDR 21=4K2K60_444,HD Audio 7.1 HDR 22=User1 23=User2 24~31=copy from hdmi output 1~8 32~39=copy from hdbt output 1~8	s edid in 1 from 1!	IN 1 EDID:1080p, Stereo Audio 2.0	IN1: 1080p, Stereo Audio 2.0 IN2: 1080p, Stereo Audio 2.0 IN3: 1080p, Stereo Audio 2.0 IN4: 1080p, Stereo Audio 2.0 IN5: 1080p, Stereo Audio 2.0 IN6: 1080p, Stereo Audio 2.0 IN7: 1080p, Stereo Audio 2.0 IN8: 1080p, Stereo Audio 2.0

ASCII Command	Function Description	Example	Feedback	Default Setting
r edid in x!	Get EDID status of the input x, x=0~8 (0=all input)	r edid in 0!	IN1 EDID: 4K2K60_444,Stereo Audio 2.0 IN2 EDID: 4K2K60_444,Stereo Audio 2.0 IN3 EDID: 4K2K60_444,Stereo Audio 2.0 IN4 EDID: 4K2K60_444,Stereo Audio 2.0 IN5 EDID: 4K2K60_444,Stereo Audio 2.0 IN6 EDID: 4K2K60_444,Stereo Audio 2.0 IN7 EDID: 4K2K60_444,Stereo Audio 2.0 IN8 EDID: 4K2K60_444,Stereo Audio 2.0	
r edid data hdmi y!	Get the EDID data of the hdmi output y port, y=1~8	r edid data hdmi 1!	EDID: 00 FF FF FF FF FF FF 00	
r edid data hdbt y!	Get the EDID data of the hdbt output y port, y=1~8	r edid data hdbt 1!	EDID: 00 FF FF FF FF FF FF 00	
r internal edid!	Get all built-in EDID information for unit support	r internal edid!	1,1080p,Stereo Audio 2.0 2,1080p,Dolby/DTS 5.1 3,1080p,HD Audio 7.1 4,1080i,Stereo Audio 2.0 20,4K2K60,Dolby/DTS 5.1 HDR 21,4K2K60,HD Audio 7.1 HDR	
Audio Setting				
s hdmi y arc z!	Turn on/off ARC of HDMI output y, y=0~8 (0=all) z=0~1 (z=0 off, z=1 on)	s hdmi 1 arc 1! s hdmi 0 arc 1!	hdmi output 1 arc on hdmi output 1 arc off hdmi all outputs arc on hdmi all outputs arc off	hdmi all outputs arc off
r hdmi y arc!	Get the ARC state of HDMI output y, y=0~8 (0=all)	r hdmi 1 arc!	hdmi output 1 arc on	
s hdbt y arc z!	Turn on/off ARC of HDBT output y y=0~8 (0=all) z=0~1 (z=0, off - use RX S/PDIF, z=1 on - use RX HDMI ARC)	s hdbt 1 arc 1! s hdbt 0 arc 1!	hdbt output 1 arc on hdbt output 1 arc off hdbt all outputs arc on hdbt all outputs arc off	hdbt all outputs arc off
r hdbt y arc!	Get the ARC state of HDBT output y, y=0~8 (0=all)	r hdbt 1 arc!	hdbt output 1 arc on	
s out y audio from z!	Set HDMI/HDBT output audio y=0~8 (0=all), z=0~28 z=0, Default z=1~8 from HDMI input 1~8 z=9~16 from HDMI out 1~8 ARC z=17~24 from HDBT out 1~8 ARC z=25~28 from embed audio 1~4 Attention: when z=0, HDMI/HDBT audio can't set audio delay.	s out 1 audio from 1! s out 0 audio from 1!	HDMI/HDBT output 1 audio: from HDMI input 1 HDMI/HDBT all outputs audio: from HDMI input 1	HDMI/HDBT all outputs from default
r out y audio!	Get HDMI/HDBT output audio status y=0~8(0=all)	r out 1 audio!	HDMI/HDBT output 1 from HDMI input 1	

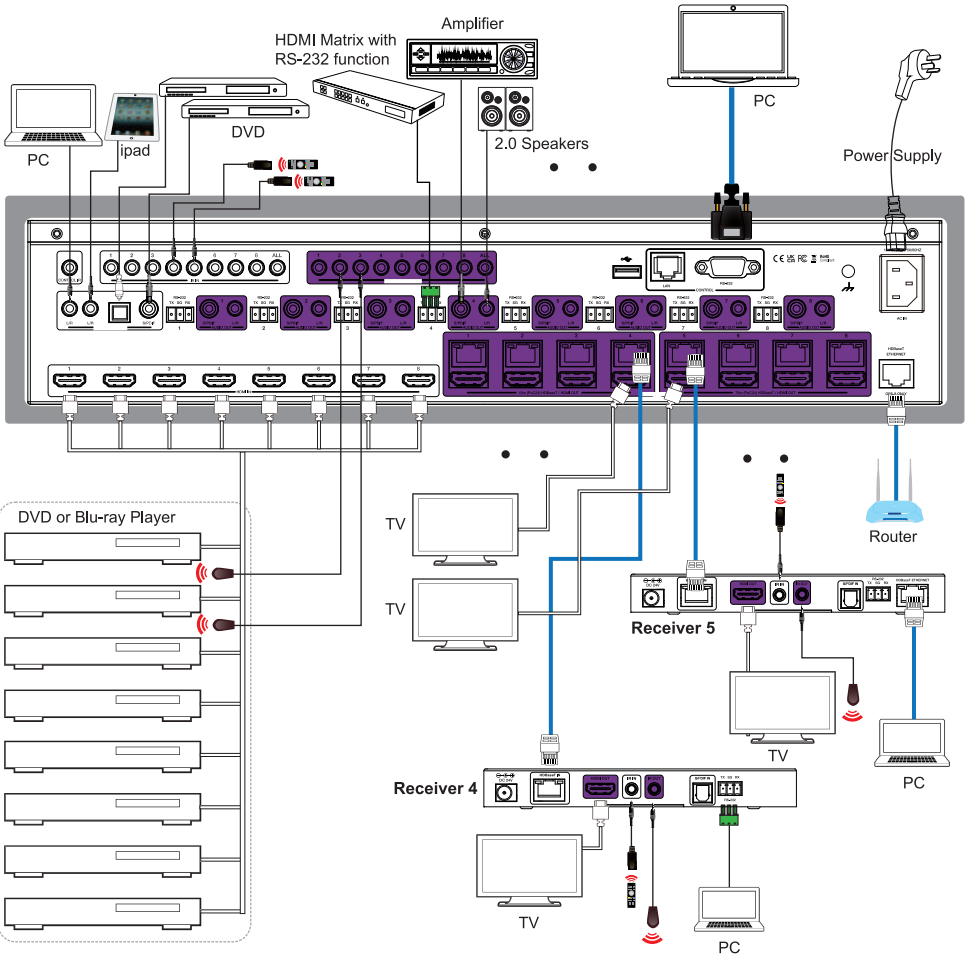
ASCII Command	Function Description	Example	Feedback	Default Setting
s coax_analog out y audio from z!	Set coaxial output audio y=0~8 (0=all), z=1~28 z=1~8 from HDMI input 1~8 z=9~16 from HDMI out 1~8 ARC z=17~24 from HDBT out 1~8 ARC z=25~28 from embed audio 1~4	s coax_analog out 1 audio from 1! s coax_analog out 0 audio from 1!	Coaxial_Analog output 1 audio: from HDMI input 1 Coaxial_Analog all outputs audio: from HDMI input 1	Coaxial_Analog all outputs audio: from HDMI input 1
s coax_analog out y audio delay z!	Set coax_analog output audio delay y=0~8 (0=all), z=0~300ms	s coax_analog out 1 audio delay 100! s coax_analog out 0 audio delay 100!	Coaxial_Analog output 1 audio delay 100ms Coaxial_Analog all outputs audio delay 100ms	Coaxial_Analog all outputs audio delay 0ms
s coax_analog out y audio vol z!	Set analog output audio volume y=0~8 (0=all), z=0~30, +, -;	s analog out 1 audio vol 30! s analog out 1 audio vol +! s analog out 0 audio vol 30! s analog out 0 audio vol +!	Analog output 1 audio volume 30 Analog all outputs audio volume 30	all Analog output audio volume 20
s coax_analog out y audio mute z!	Mute on/off coax_analog output audio y=0~8 (0=all), z=0~1 (z=0 off, z=1 on)	s coax_analog out 1 audio mute 1!	Mute on coax_analog output 1 audio	Mute off all coax_analog output audio
r coax_analog out y audio!	Get coax_analog output audio status y=0~8 (0=all)	r coax_analog out 1 audio!	Coaxial_Analog output 1 audio from HDMI input 1 Coaxial_Analog output 1 audio delay 0ms Analog output 1 audio volume 20 Mute off coax_analog output 1 audio	
CEC Setting				
s cec in x on!	set input x power on by CEC, x=0~8 (0=all input)	s cec in 1 on!	input 1 power on	
s cec in x off!	set input x power off by CEC, x=0~8 (0=all input)	s cec in 1 off!	input 1 power off	
s cec in x menu!	set input x open menu by CEC, x=0~8 (0=all input)	s cec in 1 menu!	input 1 open menu	
s cec in x back!	set input x back operation by CEC, x=0~8 (0=all input)	s cec in 1 back!	input 1 back operation	
s cec in x up!	set input x menu up operation by CEC, x=0~8 (0=all input)	s cec in 1 up!	input 1 menu up operation	
s cec in x down!	set input x menu down operation by CEC, x=0~8 (0=all input)	s cec in 1 down!	input 1 menu down operation	
s cec in x left!	set input x menu left operation by CEC, x=0~8 (0=all input)	s cec in 1 left!	input 1 menu left operation	
s cec in x right!	set input x menu right operation by CEC, x=0~8 (0=all input)	s cec in 1 right!	input 1 menu right operation	
s cec in x enter!	set input x menu enter by CEC, x=0~8 (0=all input)	s cec in 1 enter!	input 1 menu enter operation	
s cec in x play!	set input x play by CEC, x=0~8 (0=all input)	s cec in 1 play!	input 1 play operation	
s cec in x pause!	set input x pause by CEC, x=0~8 (0=all input)	s cec in 1 pause!	input 1 pause operation	

ASCII Command	Function Description	Example	Feedback	Default Setting
s cec in x stop!	set input x stop by CEC, x=0~8 (0=all input)	s cec in 1 stop!	input 1 stop operation	
s cec in x rew!	set input x rewind by CEC, x=0~8 (0=all input)	s cec in 1 rew!	input 1 rewind operation	
s cec in x mute!	set input x volume mute by CEC, x=0~8 (0=all input)	s cec in 1 mute!	input 1 volume mute	
s cec in x vol-!	set input x volume down by CEC, x=0~8 (0=all input)	s cec in 1 vol-!	input 1 volume down	
s cec in x vol+!	set input x volume up by CEC, x=0~8 (0=all input)	s cec in 1 vol+!	input 1 volume up	
s cec in x ff!	set input x fast forward by CEC, x=0~8 (0=all input)	s cec in 1 ff!	input 1 fast forward operation	
s cec in x previous!	set input x previous by CEC, x=0~8 (0=all input)	s cec in 1 previous!	input 1 previous operation	
s cec in x next!	set input x next by CEC, x=0~8 (0=all input)	s cec in 1 next!	input 1 next operation	
s cec hdmi out y on!	set hdmi output y power on by CEC, y=0~8 (0=all hdmi output)	s cec hdmi out 1 on!	hdmi output 1 power on	
s cec hdbt out y on!	set hdbt output y power on by CEC, y=0~8 (0=all hdbt output)	s cec hdbt out 1 on!	hdbt output 1 power on	
s cec hdmi out y off!	set hdmi output y power off by CEC, y=0~8 (0=all hdmi output)	s cec hdmi out 1 off!	hdmi output 1 power off	
s cec hdbt out y off!	set hdbt output y power off by CEC, y=0~8 (0=all hdbt output)	s cec hdbt out 1 off!	hdbt output 1 power off	
s cec hdmi out y mute!	set hdmi output y volume mute by CEC, y=0~8 (0=all hdmi output)	s cec hdmi out 1 mute!	hdmi output 1 volume mute	
s cec hdbt out y mute!	set hdbt output y volume mute by CEC, y=0~8 (0=all hdbt output)	s cec hdbt out 1 mute!	hdbt output 1 volume mute	
s cec hdmi out y vol-!	set hdmi output y volume down by CEC, y=0~8(0=all hdmi output)	s cec hdmi out 1 vol-!	hdmi output 1 volume down	
s cec hdbt out y vol-!	set hdbt output y volume down by CEC, y=0~8 (0=all hdbt output)	s cec hdbt out 1 vol-!	hdbt output 1 volume down	
s cec hdmi out y vol+!	set hdmi output y volume up by CEC, y=0~8 (0=all hdmi output)	s cec hdmi out 1 vol+!	hdmi output 1 volume up	
s cec hdbt out y vol+!	set hdbt output y volume up by CEC, y=0~8 (0=all hdbt output)	s cec hdbt out 1 vol+!	hdbt output 1 volume up	
s cec hdmi out y active!	set hdmi output y active source by CEC, y=0~8(0=all hdmi output)	s cec hdmi out 1 active!	hdmi output 1 active source	
s cec hdbt out y active!	set hdbt output y active source by CEC, y=0~8(0=all hdbt output)	s cec hdbt out 1 active!	hdbt output 1 active source	
Network Setting				
r ipconfig!	Get the current IP Configuration	r ipconfig!	IP Mode: DHCP IP:192.168.62.106 Subnet Mask: 255.255.255.0 Gateway:192.168.62.1 TCP/IP port:8000 Telnet port:23 Mac address: 6C:DF:FB:0C:B3:8E	
r mac addr!	Get network MAC address	r mac addr!	Mac address: 6C:DF:FB:0C:B3:8E	

ASCII Command	Function Description	Example	Feedback	Default Setting
s ip mode z!	Set network IP mode to static IP or DHCP, z=0~1 (z=0 Static, z=1 DHCP)	s ip mode 0!	Set IP mode:Static (Please use "s net reboot!" command or repower device to apply new config!)	DHCP ON
r ip mode!	Get network IP mode	r ip mode!	IP Mode: DHCP	
s ip addr xxx.xxx.xxx.xxx!	Set network IP address	s ip addr 192.168.1.100!	Set IP address: 192.168.1.100 (Please use "s net reboot!" command or repower device to apply new config!)	
r ip addr!	Get network IP address	r ip addr!	DHCP on, Device can't config static address, set DHCP off first.	
r ip addr!	Get network IP address	r ip addr!	IP:192.168.62.106	
s subnet xxx.xxx.xxx.xxx!	Set network subnet mask	s subnet 255.255.255.0!	Set subnet Mask address:255.255.255.0 (Please use "s net reboot!" command or repower device to apply new config!)	
r subnet!	Get network subnet mask	r subnet!	DHCP on, Device can't config subnet mask, set DHCP off first.	
r subnet!	Get network subnet mask	r subnet!	Subnet Mask: 255.255.255.0	
s gateway xxx.xxx.xxx.xxx!	Set network gateway	s gateway 192.168.1.1!	Set gateway: 192.168.1.1 Please use "s net reboot!" command or repower device to apply new config!	
r gateway!	Get network gateway	r gateway!	DHCP on, Device can't config gateway, set DHCP off first.	
r gateway!	Get network gateway	r gateway!	Gateway:192.168.1.1	
s tcp/ip port x!	Set network TCP/IP port (x=1~65535)	s tcp/ip port 8000!	Set TCP/IP port:8000	Set tcp/ip port:8000
r tcp/ip port!	Get network TCP/IP port	r tcp/ip port!	TCP/IP port:8000	
s telnet port x!	Set network telnet port (x=1~65535)	s telnet port 23!	Set Telnet port:23	Set telnet port:23
r telnet port!	Get network telnet port	r telnet port!	Telnet port:23	
s net reboot!	Reboot network modules	s net reboot!	Search for IP,Please wait ...! IP Mode: DHCP IP:192.168.62.111 Subnet Mask: 255.255.255.0 Gateway:192.168.62.1 TCP/IP port:8000 Telnet port:23 Mac address: 6C:DF:FB:0C:B3:8E	
s uart x mode y!	Set the mode of x local and hdbt uart, x=0-8, y=0-1, 0:bypass mode, 1:user control mode	s uart 1 mode 1!	Local And Far Uart1 Control Mode	
s uart x datalen y!	Set the data length of x local and hdbt uart, x=0-16, y=1-2, 1:8bit 2:7bit	s uart 1 datalen 1!	LocalUart1 DataLen is 8bit	

ASCII Command	Function Description	Example	Feedback	Default Setting
s uart x baudrate y!	Set the baudrate of x local and hdbt uart, x=0-16, y=1-8, 1: 115200 (Default) 2: 57600 3: 56000 4:38400 5:19200 6:14400 7:9600 8:4800	s uart 1 baudrate 1!	LocalUart%d Baudrate is 115200	
s uart x parity y!	Set the Parity of x local and hdbt uart, x=0-16, y=1-3, 1:none 2:odd 3:even	s uart x parity 1!	LocalUart1 Parity is None	
s uart x type z senddata y end!	Send data y from x local and hdbt uart, z=0 ascii, z=1 hex, x=0-16	s uart 1 type 0 senddata abcdefg end!	LocalUart1 data: abcdefg	
r uart status x!	Get the Status of x local and hdbt uart, x=0-16	r uart status 1!		

13. Application Example



14. Cable Termination and Best Practices

Sending High Bandwidth HDMI signals over Cat cable successfully is determined by the bandwidth capability of the cable network. Most problems with HDMI distribution can be avoided by following a few basic principles.

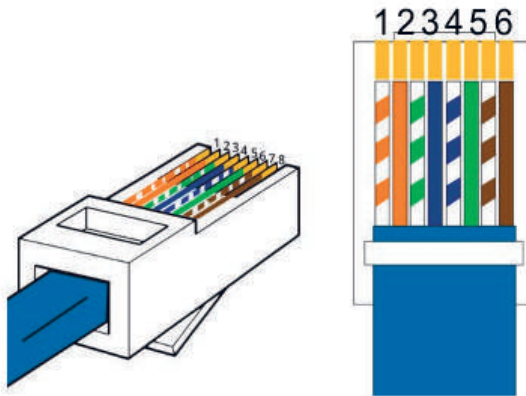
For 4K signal distribution or long distance runs over HDBaseT™ we recommend CAT6 UTP solid 23 AWG 550mhz Cable.

Use decent quality SOLID UTP CAT cable: a min CAT5E , CAT6 , CAT6A or above is recommended.

- Avoid using CCA (copper clad aluminium) this is cheap cable as its made up of mostly aluminium and does not carry the bandwidth required for long distance HDMI distribution or CSC 18Gb compression technology.
- The CAT cable should be terminated properly with the correct RG45 connectors according to TIA568B termination standard as this is less prone to electromagnetic interference.
- Avoid running the Cat cable close to or parallel with electric cables, near machinery or HVAC compressors
- Handle the Cat cable with care, avoid stretching kinking, denting, twisting ,folding or joining it as this will limit the bandwidth of the cable.
- Avoid punching down block or Wall plates, these may work but are not recommended as they add potential resistance to the network and reduce transmission distance and bandwidth.
- Avoid tight bends and tying cable ties tightly around the CAT cables.
- If the HDMI signal does not have the correct amount of bandwidth (up to 8gbps for CSC 18gbps compression) you will not get a picture. If there is any EMI (electromagnetic interference) this will disrupt the signal. If there is unstable voltage the signal will be disrupted.
- If shielded FTP CAT cables are used, they should be terminated correctly with the correct shielded connectors, if this is not done properly, more EMI interference will be introduced into the cable and performance will be inhibited.

14.1 Cable Termination Pinout

RJ45 Pin-Out T568B	
1.White Orange	5.White Blue
2.Orange	6.Green
3.White Green	7.White Brown
4.Blue	8.Brown



15. Matrix Control Protocols & Drivers

The matrix can be controlled via TCP IP, Web interface ,RS232 or IR.

For API documentation, IR hex files, and third-party control drivers, visit the PhD Solutions website at www.phdsolutions.co, where all resources are available on the relevant product page.

16. Troubleshooting

Should you encounter installation difficulties or issues with device communication, the following checklist of common issues and causes should help resolve your issues. If you continue to experience issues, please contact your place of purchase.

No picture or poor picture quality:

Connections and power: Double-check that all HDMI, Ethernet and power cables are securely connected to the correct ports and that all devices are powered on.

Cable length: Check whether you are approaching the maximum transmission distance. Refer to the matrix HDBaseT output or receiver specifications for 4K and 1080p limits. If so, reduce the resolution or use an additional extender for longer distances. Avoid bundling cables, as this can cause crosstalk and degrade signal quality.

Signal strength: The use of cable joins, stranded patch panels, wall outlets and stranded patch leads as interconnects between them, can significantly reduce signal strength. Use solid core straight through connections wherever possible.

Resolution check: Reduce the source resolution to test. If the image appears, this indicates a resolution mismatch between the source and display or a cable bandwidth limitation. Ensure all inputs and outputs support the same resolution.

Image noise (“snow”): Indicates signal instability, often caused by poorly terminated RJ45 connectors or excessive cable length. Ensure cables are correctly terminated to the TIA568B standard.

Colour issues (e.g. pink or incorrect colours): This may be caused by an invalid EDID or the source device failing to read the EDID from the matrix. Restart the matrix and all source devices to force the EDID to be re-read.

Cable quality and condition: HDMI cables and connectors can be easily damaged, and quality may vary. Older or lower-quality cables may not support all HDMI resolutions or features such as ARC and Ethernet. Always use high-quality cables and test with known working cables to identify potential issues.

IR CONTROL:

Positioning: Ensure IR emitters (TX) and receivers (RX) are correctly positioned. Emitters should be securely fixed over the IR sensor of the source device. Receivers should be placed on the display with a clear line of sight to the remote control.

Remote operation: Check that the remote control is powered and transmitting. As IR is not visible, verify this by viewing the remote through a digital camera or smartphone camera—the IR LED should flash when a button is pressed.

Interference: IR signal dropouts may occur due to external infrared interference. Keep emitters and receivers away from direct sunlight. Halogen lighting and plasma displays may also affect IR performance.

17. PhD Solutions Limited Warranty

IMPORTANT INFORMATION - YOUR RIGHTS AND WARRANTY

This Limited Warranty gives you specific legal rights. You may also have additional rights that vary by jurisdiction. The disclaimers, exclusions, and limitations of liability in this Limited Warranty will not apply to the extent prohibited by applicable law. For a full description of your legal rights, refer to the laws applicable in your jurisdiction or consult a relevant consumer advisory service.

If your product does not function adequately due to defects in materials or workmanship, **PhD Solutions Limited** (the “Warrantor”) will, during the Warranty Period:

- Repair the product using new or refurbished parts; or
- Replace it with a new or refurbished product

1. WARRANTY COVERAGE AND PERIOD

PhD Solutions Limited

Office 4106, Level 41
Mazaya Business Avenue AA1
Jumeirah Lakes Towers
Dubai 214745
United Arab Emirates

warrants to the owner of the enclosed product (“Product”) that it will be free from defects in materials and workmanship for a period of **two (2) years** from the date of delivery following the original purchase (the “Warranty Period”).

If the Product is professionally installed, the Warranty Period begins on the date the installer purchased the Product, not the system commissioning date. Please confirm this with your installer.

If the Product is professionally installed, the Warranty Period begins on the date the installer purchased the Product, not the system commissioning date. Please confirm this with your installer.

If the Product fails to conform to this Limited Warranty during the Warranty Period, PhD Solutions will, at its sole discretion:

- (a) Repair or replace any defective Product or component; or
- (b) Accept the return of the Product and refund the amount paid by the original purchaser

Repair or replacement may be carried out using new or refurbished products or components.

If the Product or any component is no longer available, PhD Solutions reserves the right to replace it with the closest equivalent product of similar function and performance, or a newer model with equivalent or improved functionality, at its sole discretion. This is your sole and exclusive remedy under this Limited Warranty.

Any Product repaired or replaced under this warranty will be covered for the longer of:

- Ninety (90) days from the date of delivery; or
- The remaining Warranty Period

This Limited Warranty is transferable, but the Warranty Period will not be extended or expanded for any transfer.

2. WARRANTY CONDITIONS AND CLAIM PROCESS

To make a claim under this Limited Warranty, the Product owner must:

- (a) Notify PhD Solutions during the Warranty Period and provide a description of the fault
- (b) Comply with all return instructions provided by PhD Solutions
- (c) Return the Product at their own cost (unless prohibited by applicable law)

PhD Solutions will have no warranty obligations for returned Products deemed ineligible after inspection.

PhD Solutions will cover return shipping costs for valid claims. For ineligible Products, all shipping costs will be the responsibility of the owner.

3. WHAT THIS LIMITED WARRANTY DOES NOT COVER

This warranty does not cover the following ("Ineligible Products"):

- Products marked as "sample" or sold "as is"

Products that have been subject to:

- (a) Modifications, alterations, tampering, or unauthorised repair
- (b) Handling, installation, testing, or use not in accordance with PHD Solutions Installations
- (c) Abuse or misuse
- (d) Power surges, voltage fluctuations, or interruptions in electrical or telecommunications networks
- (e) Use of incorrect or poor-quality cabling, terminations, or accessories
- (f) Improper grounding or system design

Electrostatic discharge (ESD) damage, including:

- Improper handling without ESD protection
- Induced electrical discharge from environmental factors

Acts of God, including but not limited to:

- Lightning (including indirect ESD effects)
- Fire, flood, tornado, earthquake, or other natural events

This warranty does not cover consumables (including batteries) unless defective due to manufacturing faults, or software (even if supplied with the Product).

Use of unauthorised service providers may impair performance and invalidate this warranty.

PhD Solutions does not warrant that the Product will operate uninterrupted, error-free, or that it will process all data correctly in all scenarios.

4. INSTALLER AND SYSTEM RESPONSIBILITY

The installer and/or system integrator is responsible for:

- Correct system design and product selection
- Proper installation, configuration, and commissioning
- Ensuring compatibility between connected devices
- Following all cabling and grounding best practices

PhD Solutions shall not be liable for system performance issues resulting from incorrect installation or design.

5. DISCLAIMER OF WARRANTIES

Except as stated in this Limited Warranty, and to the maximum extent permitted by applicable law, PhD Solutions disclaims all express, implied, and statutory warranties, including warranties of merchantability and fitness for a particular purpose.

To the maximum extent permitted by law, the duration of any implied warranties is limited to the duration of this Limited Warranty.

6. LIMITATION OF DAMAGES

In no event shall PhD Solutions be liable for any consequential, incidental, exemplary, or special damages, including loss of data or profits, arising from or related to this Limited Warranty or the Product.

Total liability shall not exceed the amount paid for the Product by the original purchaser.

7. LIMITATION OF LIABILITY

PhD Solutions disclaims all liability relating to its suppliers.

All product information and services are provided “as is” and “as available” without guarantee of accuracy or reliability.

Use of the Product and related services is at your own risk. PhD Solutions shall not be liable for any damage to:

- HVAC systems
- Plumbing
- Property
- AV or IT systems
- Connected devices or peripherals
- Any other equipment or assets

Product information is provided for convenience and is not a substitute for direct system monitoring.

8. JURISDICTIONAL VARIATIONS

Some jurisdictions do not allow limitations on implied warranties or exclusions of certain damages. In such cases, parts of this warranty may not apply.

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