



Zenty | Professional A/V Solution Provider

User Manual [v1.0]



4K60Hz 16x16 HDBaseT Matrix Extender 328ft. (100m)

ZT-198 | ZT-MT16EA



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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, surges, electric shock, lightning strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

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1. Features

- Incorporates HDBaseT technology
- Supports HDMI 2.0b 4K@60Hz 8bit YUV4:4:4, 18G, HDR
- Including 16 HDMI 2.0 Inputs and 15 HDBT outputs, 1 HDMI 2.0 output
- Transmit up to 328ft. (100m) under 1080p, 230ft. (70m) under 4K@60Hz
- HDCP 2.2/1.4 compliant
- With wide-band Bi-Direction IR routed control(38~56KHz)
- Supports Audio Matrix | 16 Analog Audio (Phoenix port) outputs
- Audio supports LPCM2.0/5.1/7.1, Dolby Digital, DTS 5.1, Dolby Digital+, Dolby True HD
- Supports RS232 pass through
- Supports Panel Button with LCD, IR Routing, RS232, TCP/IP Control
- Support PoC (Receiver powered by HDBaseT Matrix)
- Supports USB FW updating port
- 2U rack design with mounting ears
- AC 110V~220V input

2. Package Contents

- (1) x Main Unit (HDMI Matrix)
- (1) x Power cable
- (1) x Remote control
- (32) x IR Receiver cables
- (1) x CD for user manual & Command list
- (17) x 3Pin Phoenix terminal plug
- (2) x Mounting Ears
- (1) x USB2.0 to RS232 upgrade cable

3. Specifications

Operating Temperature Range	-5 to +40 °C (23 to +104 °F)
Storage Temperature Range	-10 to +60 °C (-14 to +140 °F)
Operating Humidity Range	5 to 90 % RH (no condensation)
Input Video Signal	0.5-1.0 volts p-p
Input DDC Signal	5 volts p-p (TTL)
Bandwidth	18G

Video Format Supported	4K@60Hz, YUV4:4:4 8bit 4k@30Hz/1080P/1080i/720P/576P/480P/576i/480i
HDCP Compliant	HDCP 2.2 and HDCP 1.4
Output Video	HDBaseT Tech / HDMI 2.0 Version
Audio Format Supported	LPCM up to 7.1, Dolby Atmos and DTS-X Atmos
Power Consumption	80watts (Max.)
Dimensions (L x W x H)	438mm x 394mm x 88mm / 17.2" x 15.5" x 3.5"
Net Weight	19lbs.

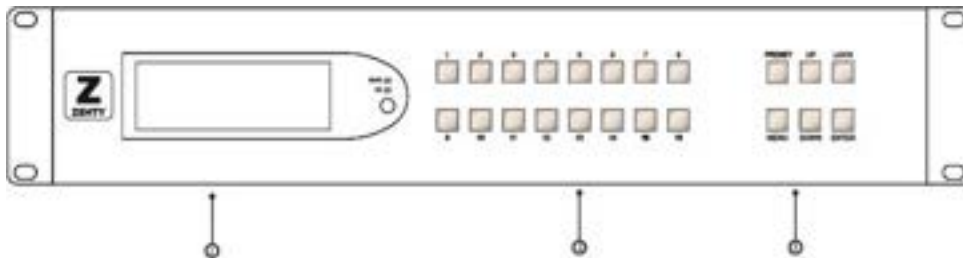
VESA Resolution List

Rate	Resolution	Supported
60Hz	640×480	√
	800×600	√
	1024×768	√
	1280×768	√
	1280×1024	√
	1600×1200	√
	1680x1050	√
	1920×1080	√
	1280×720	√
	1360×768	√
	1920×1200	√

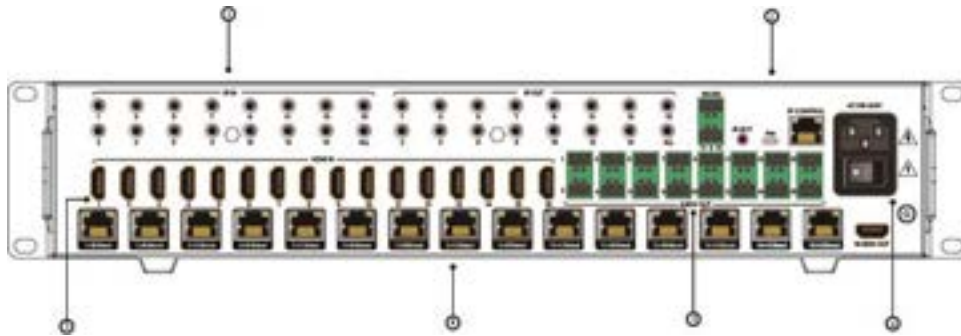
Testing Resolution List

Rate	I/P	Resolution	Supported
50Hz	I	576i	✓
	P	576P	✓
	P	720P / 1080P / 4K2K	✓
60Hz /59.94Hz	I	480i/1080i	✓
	P	480P / 720P / 1080P / 4K2K	✓
30/29.97Hz	P	720P / 1080P / 4K2K	✓
24Hz	P	1080P / 4K2K	✓
25Hz	P	720P / 1080P / 4K2K	✓

4. Panel Descriptions



- ① LCD: Showing Matrix information
- ② Output button OUT1~16 & Input button IN1~16
- ③ Function button: PRESET; MENU; UP; DOWN; LOCK; ENTER



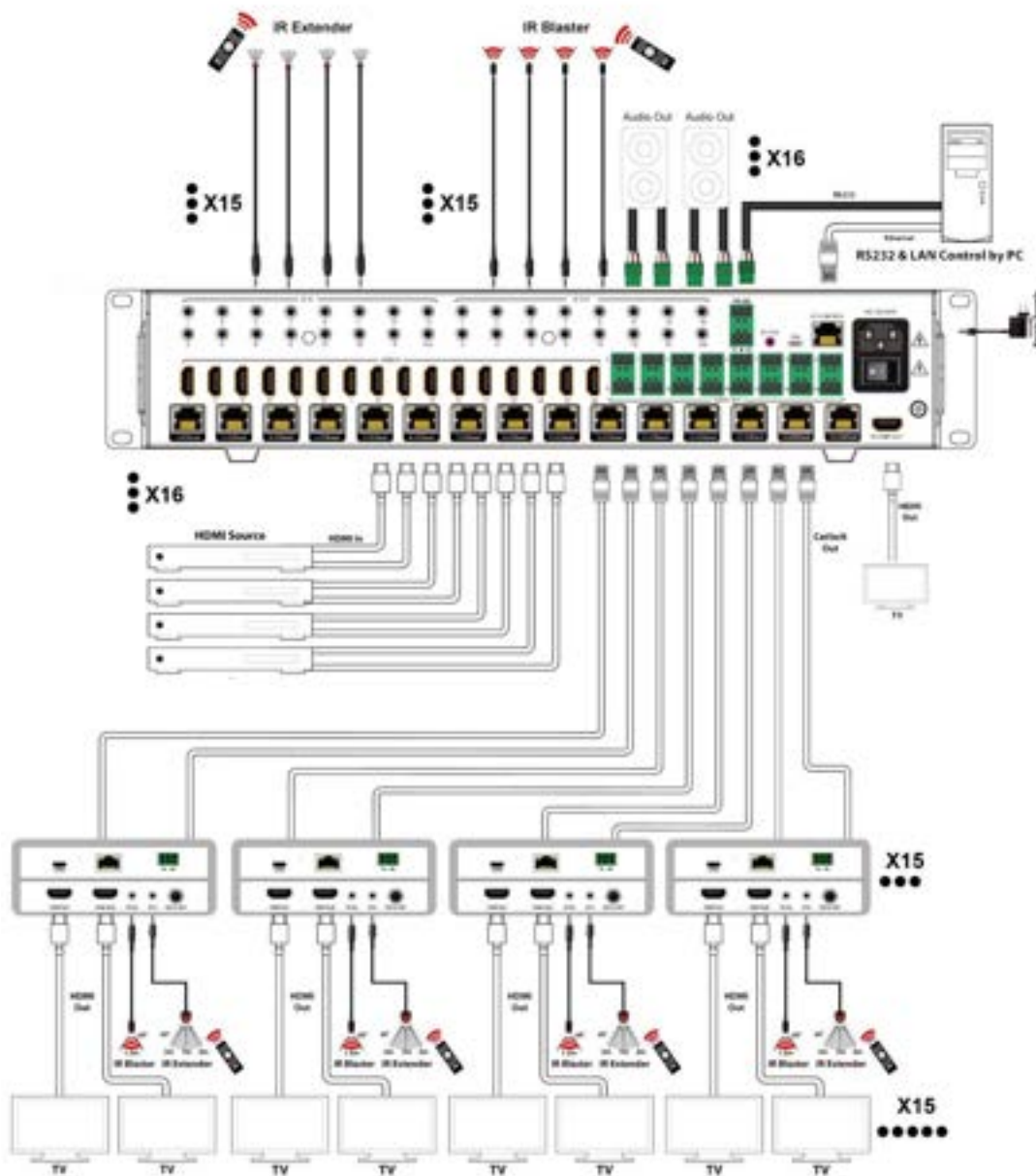
- ① IR IN & IR OUT & IR Ext
- ② FW & Ethernet & RS232 Control ports
- ③ HDMI 2.0 INPUT Ports
- ④ 15 HDBaseT Output Ports and 1 HDMI Output port
- ⑤ Analog Audio out x16 (supports Audio Matrix)
- ⑥ Power On/Off

HDBaseT Receiver

- 1. 2x HDMI 2.0 Outputs
- 2. IR Out and IR In
- 3. DC12-24V (When PoC ON, no need to plug power adapter)
- 4. CAT5e/6 Port
- 5. RS232 Port
- 6. FW Upgrade port



5. Wiring Diagrams



6. Input / Output Channel Key Operation

Channel	Button method
Any Key	The first operation of the button can wake up the screen and do the command
Output 1-16 Input 1-16	1: By using UP / DOWN Button to select Output or Input channel 2: Directly press the number key, such as the output channel 5, press button "5" and press it again to cancel the selection; Long press output to select all channels, and long press again to cancel 3: Directly press the number key, such as input channel 1, and select "1" to press (only when the output port is selected, the input channel number will be valid) Long press means all outputs select current input
PRESET	Shortcut key for calling the preset
MENU	Function Button; Short press to enter the function option or back to previous option
ENTER	Confirm Button: enter function selection mode
UP	Button for UP option
DOWN	Button for NEXT option
LOCK	Long press to "LOCK" (button blue light on), Long press again to UNLOCK (button blue light off)

7. Video Switching Operation

7.1 Video Switch

The signal switch includes 16 free switching channels, which can be configured as input/output according to the requirements, forming a matrix of 1 x 16 ~ 16 x 1, which can switch any input signal to 1 channel output or all channel output.

The specific operation as follows:

Output	1	2	3	4	5	6	7	8
Input	1	2	3	4	5	6	7	8

Output	9	10	11	12	13	14	15	16
Input	9	10	11	12	13	14	15	16

Switch the input to the output

Operation format: "output channel" + "input channel"

For Example: Output port 1 switch to input 5

Operation: Press OUT number "1" + Button "DOWN" + IN number "5" to complete the switch

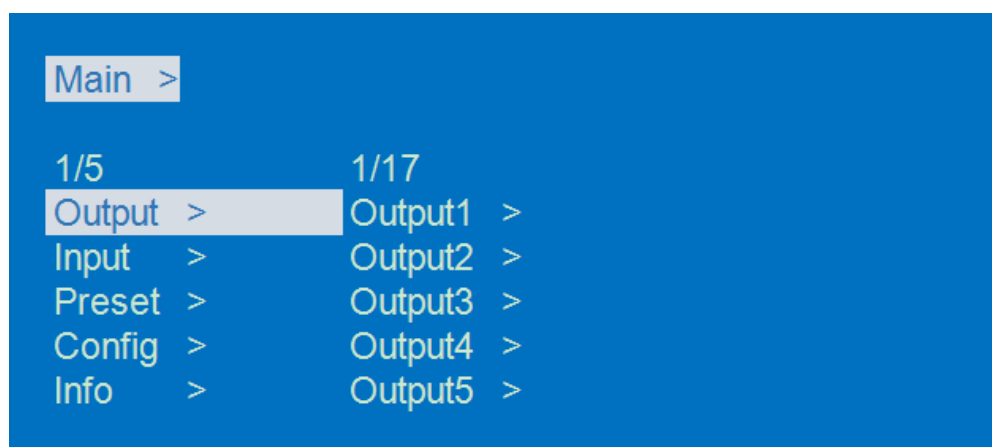
7.2 Video Control

The Main interface have five sub menus:

1. Output Setting

Including 17 sub menu (Output1~16, All). Each sub menu with Video and Audio option

Video supports switching the channels and turn on/off the video signals



Main > Output >

1/17	1/2
Output1	> Video >
Output2	> Audio >
Output3	>
Output4	>
Output5	>

Main > Output > Output 1 > Video >

1/2	1/16
Source	> Input1 @
Onoff	> Input2
	Input3
	Input4
	Input5

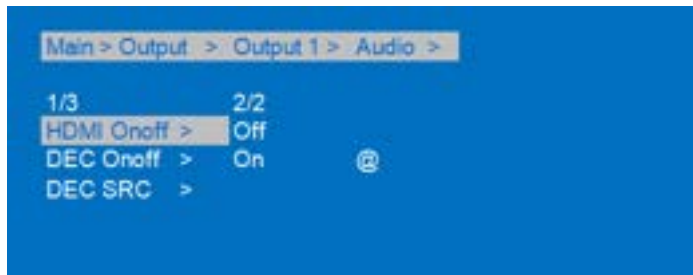
Main > Output > Output 1 > Video >

2/2	2/2
Source	> Off
Onoff	> On @

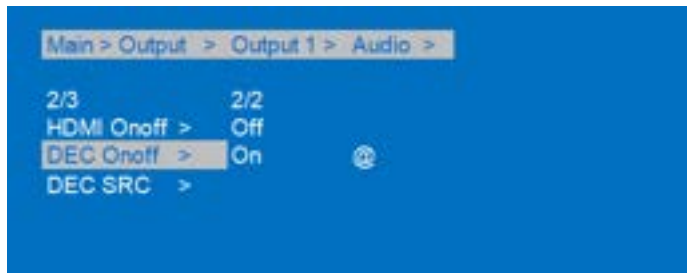
Audio supports turn on/off HDMI, HDMI SRC, DEC On/Off DEC SRC (Source) switching

Main > Output > Output 1 >

2/2	1/3
Video	> HDMI Onoff >
Audio	> DEC Onoff >
	DEC SRC >

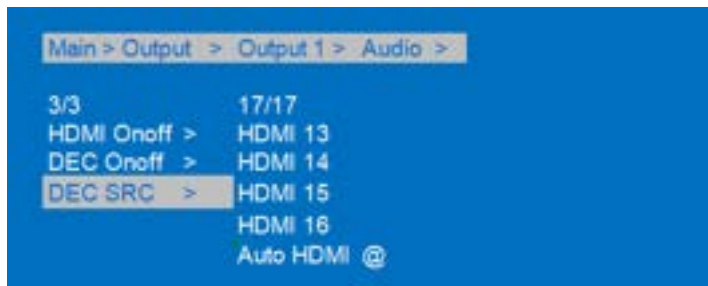


DEC On/Off supports to turn on or turn off the output's audio extraction



DEC SRC (Audio Matrix)

Auto HDMI means Output's audio follow with the Input. Supports to select other input's audio

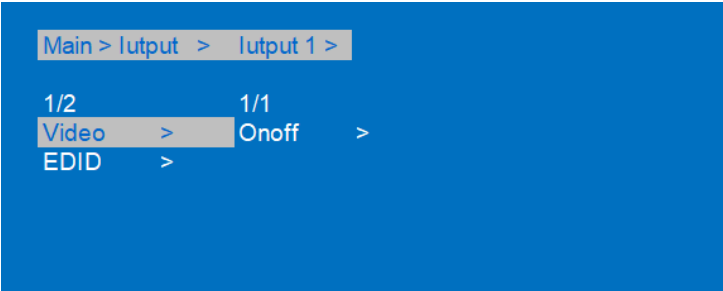


2. Input Setting

Including 17 sub menu (Output1~16, All). Each sub menu with Video and EDID option

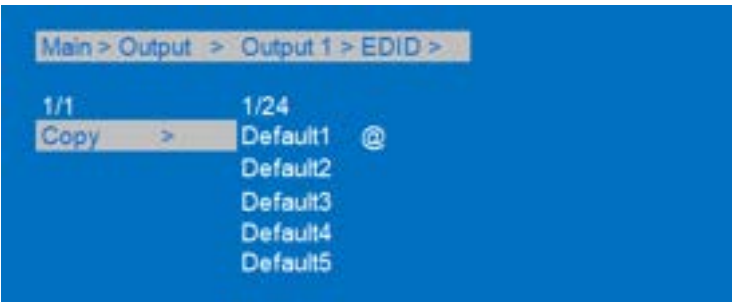
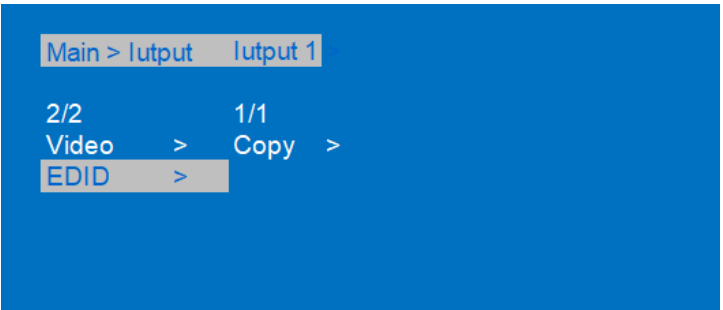
Video supports turning on/off the video signals, and won't affect the Audio extraction





EDID including 4xDefault, 4xUser, 16x Copy Output

Default1	1080P 444-LPCM: 2.0-192Khz	Default2	4K30 444-LPCM: 2.0-192Khz
Default3	4K60 420-DTSHD-8-192Khz	Default4	4K60 444-DTSHD-8-192Khz



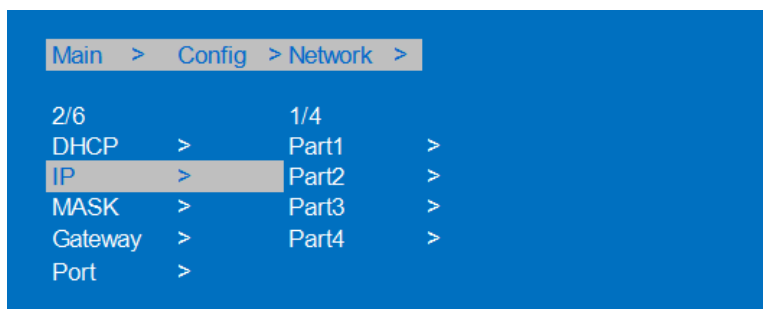
3. Preset setting

Including Clear, Save, Call option. Total support 8 presets.



4. Config setting

Including Network, RS-232, User EDID, System



Main > Config > Network > Port >

1/2		5000/65534
TCP	>	4996
UDP	>	4997
		4998
		4999
		5000

Main > Config > Network > Port > TCP >

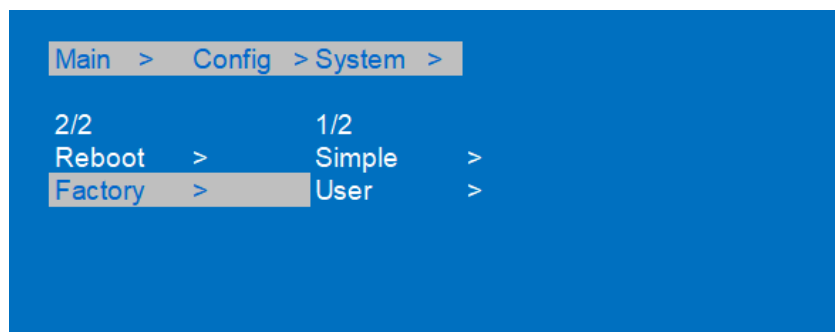
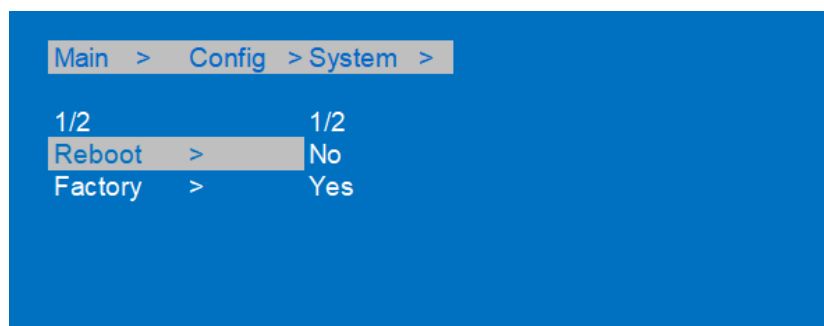
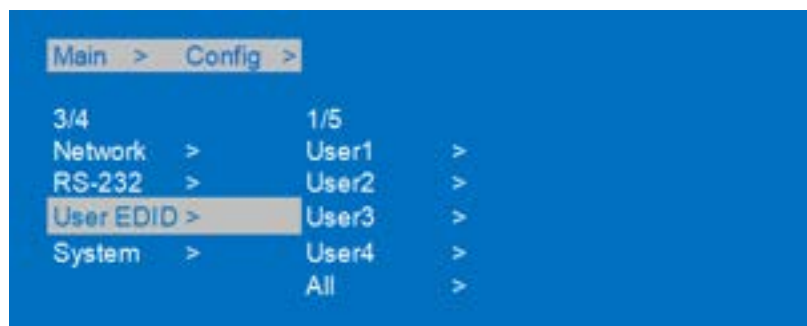
5000/65534		
4996	DHCP	Off
4997	IP	192.168.1.168
4998	MASK	255.255.255.0
4999	GW	192.168.1.1
5000	@	MAC 4658-4E92-6D76

Main > Config >

2/4		1/4	
Network	>	Baud	>
RS-232	>	Data	>
User EDID	>	Stop	>
System	>	Parity	>

Main > Config > RS-232 >

1/4		6/6
Baud	>	9600
Data	>	19200
Stop	>	38400
Parity	>	57600
		115200 @



*Factory simple: restore running info. (Includes Video, Audio, EDID, Setup).

*Factory All: reset all default setup functions.

5. Info setting

Including Input, Output, System, LOG

Input: Showing connection status, input resolution, deep color, audio format and HDCP version etc.

Output: Showing TV info.

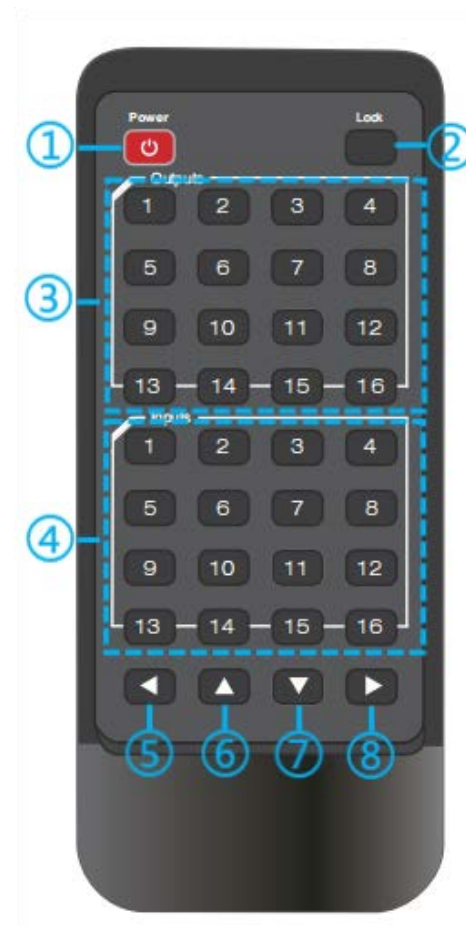
System: Showing the device info., Versions, Network

LOG: Showing products common information like running time, booting times etc.



8. Remote Control Description

- ① Standby Mode
- ② Lock or Unlock the Panel Button
- ③ Choose output from 1-16
- ④ Choose input from 1-16
- ⑤ Menu (back to previous option) button
- ⑥ UP button
- ⑦ Down button
- ⑧ Enter button



9. IR System

The matrix can pass the IR signal through the IR system to the HDMI source or pass the IR signal from the HDMI source to the HDMI sink.



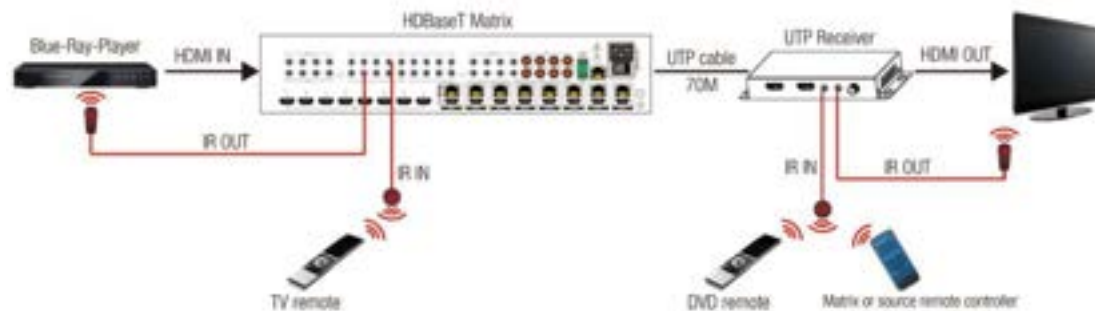
Dual way IR using:

Step1: “IR IN” is for HDBaseT output, “IR OUT” is for input channel

Step2: “IR IN ALL” Controlled by all input IR; “IR OUT ALL” Controlled by all output IR.

Step3: HDBaseT receiver support connect with IR receiver to control the Matrix by remote

Step4: Matrix IR channel “IR IN ALL” support connect with IR-RX cable to control the Matrix by remote



10. RS232 Command Control

Default IP Address	192.168.1.168
TCP Port	5000
UDP Port	5001
Telnet Port	23
Baud Rate	115200

Control software operation:

The serial control software is illustrated with SSCOM32 as an example.

Basic Settings:

Double-click the software in the installation package to run specifically (as shown in figure 1 below) and install the RS232 software on the computer.

Enter the main interface of the software, as shown in the figure below.



In the parameter config. area, select the serial port number that the serial line connects to the PC

Baud rate: 115200 (default)

Data location: 8.

Stop bit: 1

Check bit: no

Then can input commands in the command input area to control the local or remote receiver

Such as changing IP address to be 192.168.1.168:

Command is: #network IP = 192.168.1.168

Instructions:

1. All commands start from “#”, command head “%c”: “d” parameters, “l” lock, “s” save.
2. The “_” in the commands cannot omit. Parameter: %d: 0 means ALL. 1-x means specified outputs (1~16).

3. Command head & Parameter1 & Parameter2... need to add one "SPACE".

The following table is only an example. Please refer to the list of instructions.

Instruction description	instruction	parameter 1	parameter 2	parameter 3
Video switch	#video_%c	out%d	in%d	matrix=%d
Audio Mode Switch	#audio_%c	in%d	/	enc=%d
EDID	#EDID_%c	ln%d	cfg=%d	/

Please refer to the "Command list" for details.

Example: ALL output switches to input 4.

Operation format: #video_d out0 matrix=4

Supports multi-Outputs selecting, such as: #video_d out3,2,1 source=3

TCP/UDP Control

- ① Commands are the same as the RS232 commands
- ② TCP supports command feedback, UDP only for sending commands, no data feedback
- ③ Can't support PUTTY type's tools

Telnet Control

- ① "window" + "R" typing "cmd" + "Enter"
- ② Typing: Telnet 192.168.1.168 (According to the correct IP address) + "Enter"
- ③ User: admin; Password: admin
- ④ Command: #cmd to get the command list

```

ip=%d.%d.%d.%d
mask=%d.%d.%d.%d
gw=%d.%d.%d.%d
port_tcp=%d
port_udp=%d
device=%15t

-----
#menu
call=%16,d
end=%c%d
time_to_main=%d
select_run=%d

-----
#account
login
register%d
id=%15t
psd=%15t

-----
#uart
baud=%d

-----
#led
bl_lv=%d
bl_cnt=%d

-----
#factory
lv=%d

```

11. Web Control

1). Connect the Ethernet port of matrix to the Ethernet port on PC by a crossover cable with RJ45 connectors.

2). Configure your PC as follows:

- ① Click **Start > Control Panel > Network and Sharing Center**.
- ② Click **Change Adapter Settings**.
- ③ Highlight the network adapter you want to use to connect to the device and click **Change settings of this connection**.

3). The local Area connection properties window for Network selection appears as below:

4). Click the Highlight **Internet Protocol Version 4 (TCP/IPv4)**.

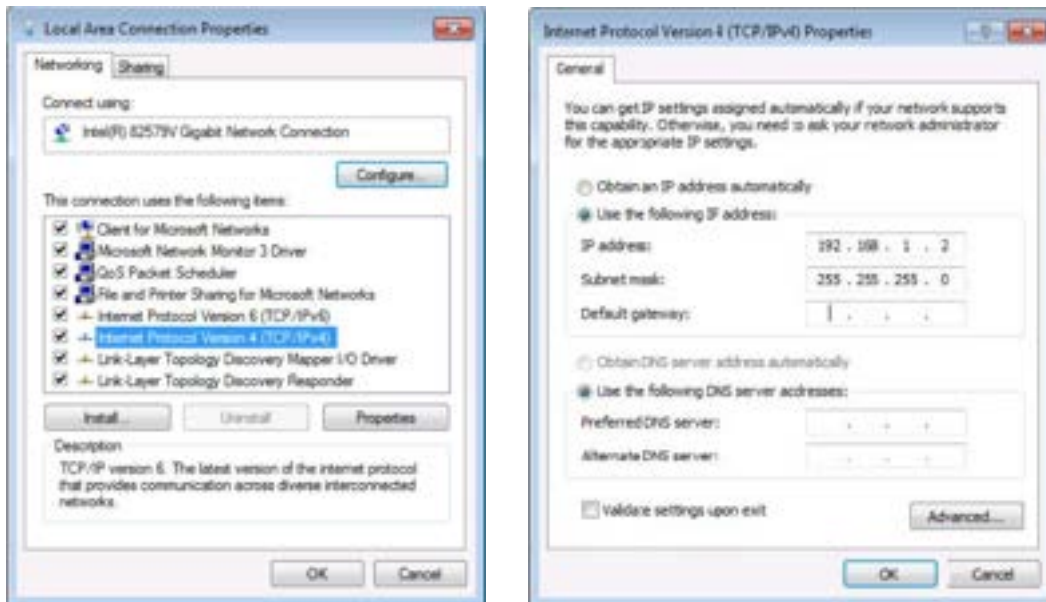
5). Click **Properties**.

6). Select **Use the following IP Address** for static IP addressing and fill in the details.

For TCP/IPv4 you can use any IP address in the range 192.168.1.1 to 192.168.1.255 (excluding 192.168.1.168).

7). Click **OK**.

8). Click **Close**.



11.1 Enter Web and Control

Enter the default IP address of the matrix: **192.168.1.168**

Account: admin

Password: admin

(If forgetting the account information, sending command: #factory root=8

back to the default account information)



11.2 Status Interface

Input Info & Output Info & Device Info:

[illegible]

11.3 Input Interface

Rename: Double click to revise the input port's name, max 15 characters

Video: Turn On/Off the Input's video, won't affect the audio extraction

EDID: For setting and checking Default EDID, Copy output and User EDID information

USER EDID: Supports saving Default or Output's EDID to User EDID, and using the BIN documents upload to the User EDID

Input	Rename	Video	Copy EDID From
In1	Input1	☒	Default1:4096x2160P@60-444 HDR.HLG ▾
In2	Input2	☒	Default1:4096x2160P@60-444 HDR.HLG ▾
In3	Input3	☒	Default1:4096x2160P@60-444 HDR.HLG ▾
In4	Input4	☒	Default1:4096x2160P@60-444 HDR.HLG ▾
In5	Input5	☒	Default1:4096x2160P@60-444 HDR.HLG ▾
In6	Input6	☒	Default1:4096x2160P@60-444 HDR.HLG ▾
In7	Input7	☒	Default1:4096x2160P@60-444 HDR.HLG ▾
In8	Input8	☒	Default1:4096x2160P@60-444 HDR.HLG ▾
In9	Input9	☒	Default1:4096x2160P@60-444 HDR.HLG ▾
In10	Input10	☒	Default1:4096x2160P@60-444 HDR.HLG ▾
In11	Input11	☒	Default1:4096x2160P@60-444 HDR.HLG ▾
In12	Input12	☒	Default1:4096x2160P@60-444 HDR.HLG ▾
In13	Input13	☒	Default1:4096x2160P@60-444 HDR.HLG ▾
In14	Input14	☒	Default1:4096x2160P@60-444 HDR.HLG ▾
In15	Input15	☒	Default1:4096x2160P@60-444 HDR.HLG ▾
In16	Input16	☒	Default1:4096x2160P@60-444 HDR.HLG ▾
All		☒	Default1:4096x2160P@60-444 HDR.HLG ▾

Copy EDID From

Default1:4096x2160P@60-444 HDR.HLG LPCM 2.0 JTD ▾

to

User1 ▾

Apply

User EDID

Browse

to

User1 ▾

Upload

11.4 Output Interface

Rename: Double click to revise the output port's name, max 15 characters

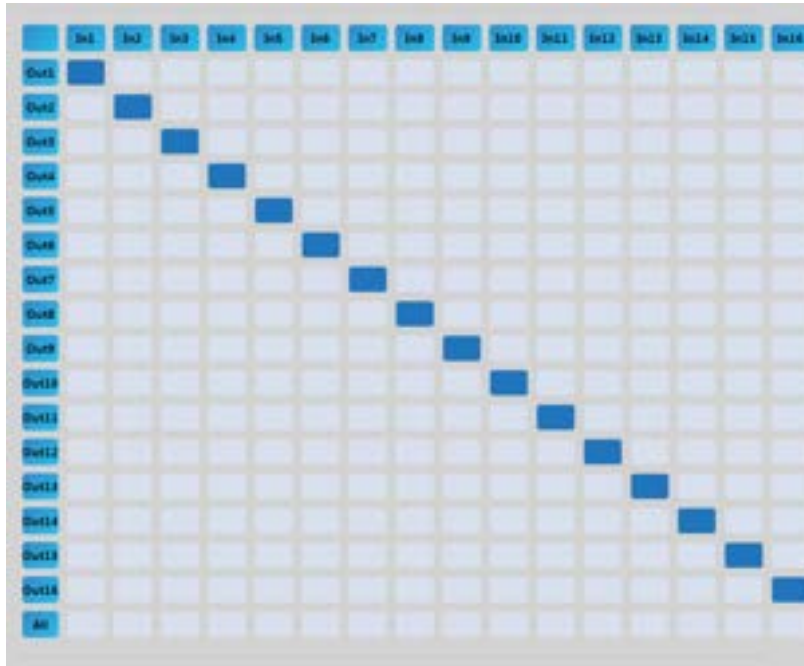
Audio Dec and ARC can only enable one of them

Dec Src means decode the source audio from HDMI 1~16,

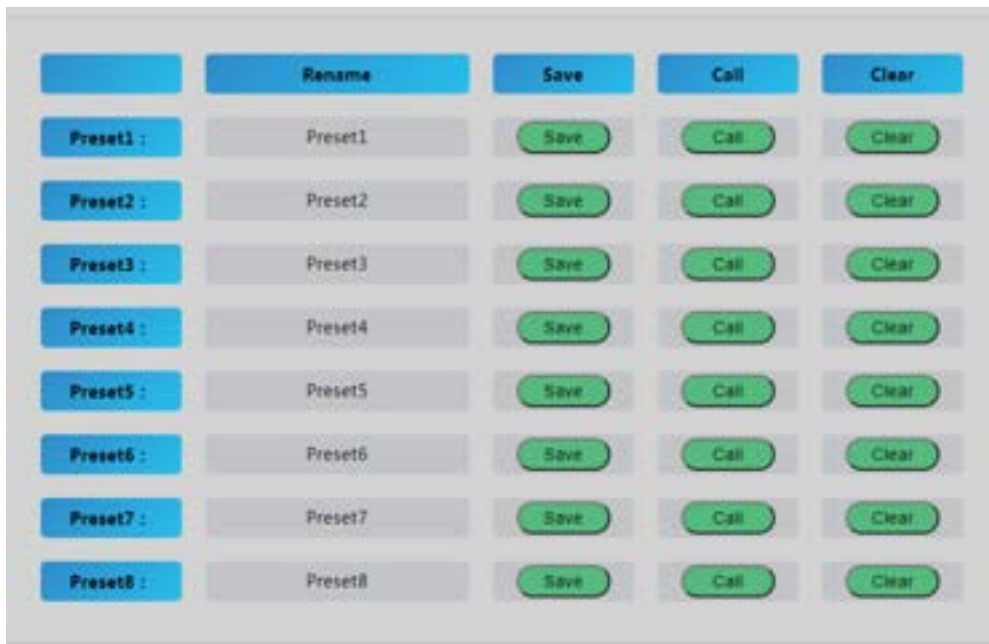
Auto HDMI means follow with the output's selection

Output	Rename	Video	Audio HDMI	Audio Dec	Dec Src
Out1	Output1				HDMI1 ▾
Out2	Output2				HDMI1 ▾
Out3	Output3				HDMI1 ▾
Out4	Output4				HDMI1 ▾
Out5	Output5				HDMI1 ▾
Out6	Output6				HDMI1 ▾
Out7	Output7				HDMI1 ▾
Out8	Output8				HDMI1 ▾
Out9	Output9				HDMI1 ▾
Out10	Output10				HDMI1 ▾
Out11	Output11				HDMI1 ▾
Out12	Output12				HDMI1 ▾
Out13	Output13				HDMI1 ▾
Out14	Output14				HDMI1 ▾
Out15	Output15				HDMI1 ▾
Out16	Output16				HDMI1 ▾
All					HDMI1 ▾

11.5 Matrix Interface



11.6 Preset Interface



11.7 System Interface

The screenshot displays a web-based system interface with three main sections: Network management, Account management, and System management. Each section contains several configuration fields and buttons.

Network management

Mac Address	4E:58:4E:9E:E0:F3
IP Address	192.168.1.168
Net Mask Address	255.255.255.0
Gate Way Address	192.168.1.1
DHCP	☐ Off
TCP Port	5000

Apply

Account management

User Name	
New Password	
Confirm the Password	

Apply

System management

Reboot	Apply
Factory Simple	Apply
Factory All	Apply

*Factory simple: restore running info. (Includes Video, Audio, EDID, Setup).

*Factory All: reset all default setup functions.

12. Firmware Upgrade

First upgrade MCU (layer of application) and then upgrade CPLD, finally upgrade MCU, HTML (web page), (CPLD, HTML, MCU all support to use USB Micro port for upgrading)

A1 means MCU

C0 means CPLD

F0 means HTML

MCU Upgrade:

Open the software UART_ISP_V1.6.exe on PC, select the correct port and baud rate 115200, enter "A1" in Port, then select the path of the program in PATH (XXX. Bin), and click UPDATA to complete the upgrade.



HTML (WEB GUI) Upgrade:

Open the software UART_ISP_V1.6.exe on PC, select the correct port and baud rate 115200, enter "F0" in Port, then select the path of the program (XXX. HTML) in PATH, and click UPDATA to complete the upgrade.



13. Maintenance

Clean this unit with a soft, dry cloth. Never use alcohol, paint thinner, or benzine to clean.

14. Warranty

If your product does not work properly because of a defect in materials or workmanship, our company (referred to as “the warrantor”) will, for the length of the period indicated as below, “Parts and Labor (5) Years”, which starts with the date of original purchase (“Limited Warranty period”), at its option either (a) repair your product with new or refurbished parts, or (b) replace it with a new or a refurbished product. The decision to repair or replace will be made by the warrantor.

During the “Labor” limited warranty period, there will be no charge for labor. During the “Parts” warranty period, there will be no charge for parts. You must mail-in your product during the warranty period. This Limited Warranty is extended only to the original purchaser and only covers products purchased as new. A purchase receipt or other proof of original purchase date is required for Limited Warranty service.

15. Mail-In Service

When shipping the unit, carefully pack and send it prepaid, adequately insured, and preferably in the original carton. Include a letter detailing the complaint and provide a day time phone and/or email address where you can be reached.

16. Limited Warranty Limits and Exclusions

This Limited Warranty ONLY COVERS failures due to defects in material or workmanship, and DOES NOT COVER normal wear and tear or cosmetic damage. The Limited Warranty ALSO DOES NOT COVER damages which occurred in shipment, or failures which are caused by products not supplied by warrantor, or failures which result from accidents, misuse, abuse, neglect, mishandling, misapplication, alteration, faulty installation, set-up adjustments, mis-adjustment of consumer controls, improper maintenance, power line surge, lightning damage, modification, or service by anyone other than a Factory Service center or other Authorized Servicer, or damage that is attributed to acts of God.

THERE ARE NO EXPRESS WARRANTIES EXCEPT AS LISTED UNDER "LIMITED WARRANTY COVERAGE". THE WARRANTOR IS NOT LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THIS PRODUCT, OR ARISING OUT OF ANY BREACH OF THIS WARRANTY. (As examples, this excludes damages for lost time, cost of having someone remove or re-install an installed unit if applicable, travel to and from the service, loss of or damage to media or images, data or other recorded content. The items listed are not exclusive, but are for illustration only.) PARTS AND SERVICE, WHICH ARE NOT COVERED BY THIS LIMITED WARRANTY, ARE YOUR RESPONSIBILITY.



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