MS-HBTB66C70 KIT
6x6 HDMI 18Gbps
over HDBaseT™ Matrix with
Audio Matrixing

SEADA
Showing the World

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 service lifeof your equipment.

Table of Contents

1. Introduction

The 6x6 HDMI/HDBaseT matrix supports the transmission of video (resolutions up to 4K2K@60Hz 4:4:4, HDCP 2.2, HDMI2.0) and multi-channel digital audio from 6 HDMI sources to 4 HDBaseT outputs and 2 independent HDMI 2.0 outputs. HDBaseT outputs allow transmission via a single CAT5e/6/7 cable up to 230 feet/70 meters and the independent HDMI outputs support cable lengths of up to 33 feet/10 meters. This matrix built-in an independent 18x12 digital audio matrix with volume/delay tuning and also supports high resolution digital audio formats such as LPCM 7.1CH, Dolby TrueHD, Dolby Digital Plus, Dolby Atmos and DTS-HD Master Audio as well as 3D video content pass-through. The matrix can be easily controlled via the front panel button, IR, RS-232, Telnet and Web GUI.

2. Features

- ✧ HDMI 2.0b (18Gbps), HDCP 2.2 and DVI compliant
- ✧ Routes 6 HDMI sources to 6 displays including 4 HDBaseT outputs and 2 independent or mirrored HDMI outputs
- ✧ Supports resolutions up to 4K@60 (YUV 4:4:4) on all HDMI ports
- ✧ Supports automatic 4K@60 (YUV 4:4:4) to 4K@60 (YUV 4:2:0) conversion for all HDBaseT outputs
- ✧ 4K/2K & 4K UHD signals can be transmitted up to 130 feet/40 meters and 1080P up to 230 feet/70 meters via CAT5e/6/7
- ✧ Supports pass-through of HD audio formats: LPCM 2/5.1/7.1CH, Dolby Digital 2/5.1CH, Dolby Digital Plus, Dolby TrueHD, Dolby Atmos, DTS-HD Master Audio and DTS X
- ✧ Built-in independent audio matrix with Volume, Mute, and Audio delay adjustment for lip-sync (LPCM only)
- ✧ HDR10, Dolby Vision, ARC, CEC and smart EDID management supported
- ✧ 24V POC on all HDBaseT ports

✧ Control is via on-panel Button, IR, RS-232, Telnet and Web GUI

✧ 1U rack mounted design with aluminum front panel housing

3. Package Contents

✧ 1 x 6x6 Matrix Unit

✧ 4 x 70M HDBaseT Receivers

✧ 7 x Wideband IR Blaster cables

✧ 8 x Wideband IR Receiver cables

✧ 1 x RS-232 male to female cable

✧ 1 x AC power cable

✧ 1x Remote Controller

✧ 1 x User Manual

4. Specifications

Technical	
HDMI Compliance	HDMI 2.0b
HDCP Compliance	HDCP 2.2 and HDCP 1.4
Video Bandwidth	Up to 18 Gbps
Video Resolutions	up to 4K2K@50/60Hz(YUV4:4:4),4K2K@30Hz,1080P@120Hz, and 1080P 3D@60Hz
Color Space	RGB, YCbCr 4:4:4, YCbCr 4:2:2
Color Depth	10-bit, 12-bit
HDMI Audio Formats (Pass-through)	LPCM 2/5.1/7.1CH, Dolby Digital, DTS 5.1, Dolby Digital+, Dolby TrueHD, DTS-HD Master Audio, Dolby Atmos, DTS:X
Audio Formats (Optical/Coaxial In)	LPCM 2/5.1/7.1CH, Dolby Digital, DTS 5.1, Dolby Digital+
Audio Formats (Analog/Coaxial Out)	LPCM 2CH up to 192KHz sample rate

L/R Audio Formats	Analog Stereo 2CH
Infrared Frequency	20KHz - 60KHz
ESD Protection	Human body model — ±8kV (air-gap discharge) & ±4kV (contact discharge)

Connections	
Inputs	6x HDMI Type A [19-pin female] 2x L/R Audio In [3.5mm Stereo Mini-jack] 2x Optical Audio In [S/PDIF] 2x Coaxial Audio In[S/PDIF] 8x IR In [3.5mm Stereo Mini-jack] 4x RS-232 [3pin Phoenix Jack] 1x TCP/IP[RJ45]
Outputs	2x HDMI Type A [19-pin female] 4x HDBaseT Out [RJ45] 6x L/R Audio Out [3.5mm Stereo Mini-jack] 6x Optical Out [S/PDIF] 7x IR Out[3.5mm Stereo Mini-jack]

Mechanical	
Housing	Metal Enclosure
Color	Black
Dimensions	483 mm [W] x 303 mm [D] x 44.5 mm [H]
Weight	2110g
Power Supply	Input: AC100 - 240V 50/60Hz
Power Consumption	60W (Max)
Operation Temperature	32 - 104°F / 0 - 40°C
Storage temperature	-4 - 140°F / -20 - 60°C
Relative Humidity	20 - 90% RH (no condensation)

5. Operation Controls and Functions
5.1 Front Panel
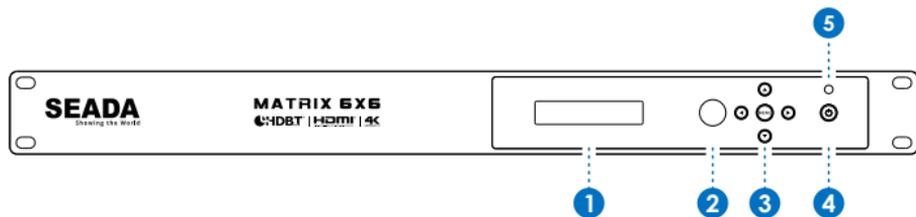
1 **OLED Display:** Displays the information of each input and output status, EDID management and the matrix's IP address.

2 **IR Receiver Window:** Receive IR signal.

3 **Left/Right /Up/Down/Menu Buttons:** After system power up, the OLED default displays the map of the input and output, then you can operate the following functions by the combination of these five buttons,included five Setup Menu:Select EDID、PTP Set、Save Preset、Recall Preset、View IP and Set up the map of input and output and Inquire each input's EDID status.

a.Select EDID: On the initial OLED display you can press "Menu" button to enter Setup Menu page. You can press the "Up" and "Down" buttons into select EDID mode page,the EDID table as showed in the below table, you can press "Right" buttons into the EDID table and press "Up" or "Down" buttons to select your chosen EDID,then you press "Right" button into which selected inputs page and press "Up" or "Down" to select which inputs copied the chosen EDID , pressing the "Menu" or "Right" button to confirm this operation finally. If success the screen will go back to initial OLED display.

The EDID mode table:

1	720p,Stereo Audio 2.0
2	1080p,Stereo Audio 2.0
3	1080p,Dolby/DTS 5.1
4	1080p,HD Audio 7.1
5	1080i,Stereo Audio 2.0
6	1080i,Dolby/DTS 5.1
7	1080i,HD Audio 7.1
8	3D,Stereo Audio 2.0
9	3D,Dolby/DTS 5.1
10	3D,HD Audio 7.1
11	4K2K30_444,Stereo Audio 2.0
12	4K2K30_444,Dolby/DTS 5.1
13	4K2K30_444,HD Audio 7.1
14	4K2K60_420,Stereo Audio 2.0
15	4K2K60_420,Dolby/DTS 5.1
16	4K2K60_420,HD Audio 7.1
17	4K2K60_444,Stereo Audio 2.0
18	4K2K60_444,Dolby/DTS 5.1
19	4K2K60_444,HD Audio 7.1
20	Copy EDID from HDMI output A
21	Copy EDID from HDMI output B
22	Copy EDID from HDMI output C
23	Copy EDID from HDMI output D
24	Copy EDID from HDMI output E
25	Copy EDID from HDMI output F

b.PTP Set: On the initial OLED display you can press "Menu" button to enter Setup Menu page. You can press the "Up" or "Down" into the PTP Set page. and press the "Right" to confirm this operation.

If success the screen will go back to PTP Set page,you can press "Left" button to go back the initial OLED display.

c.Save Preset: On the initial OLED display you can press "Menu" button to enter Setup Menu page. You can press the "Up" or "Down" buttons into the Save Preset page, and press the "Right" button into the Save Preset. There are five groups(Save to #1 or #5),you can press "Up" or "Down" buttons to select which group you want to save all current settings on it. Pressing the "Right" button to confirm this operation finally, If success the screen will go back to Save Preset page, you can press "Left" button to go back the initial OLED display.

d.ReCall Preset: On the initial OLED display you can press "Menu" button to enter Setup Menu page. You can press the "Up" or "Down" buttons into the ReCall Preset page. and press the "Right" button into the ReCall Preset. There are five groups(ReCall #1 or #5), you can press "Up" or "Down" buttons to select which group you want to ReCall all save settings from it. Pressing the "Right" button to confirm this operation finally. If success the screen will go back to ReCall Preset page, you can press "Left" button to go back the initial OLED display.

e.View IP: On the initial OLED display you can press "Menu" button to enter Setup Menu page. You can press the "Up" or "Down" buttons into the View IP page. Pressing the "Right" button to confirm this operation finally. If success the screen will show the matrix IP address. You can press "Left" button to go back the initial OLED display.

f.Selecting Input/output: On the initial OLED display you can press the "Left" and "Right" buttons to select the output then press the "Up" and "Down" buttons to select the input port, then press the "Menu" button to confirm this operation.

g.EDID Status: On the initial OLED display you can press the "Up" and "Down" button to check each input's EDID setting, pressing the "Menu" button go back to the initial OLED display.

4 **Power Button:** This button allows users to power on or standby the matrix.

5 **Bi-Colors LED:** The LED indicates the matrix status, Red color indicates the matrix in standby mode and Green color indicates the matrix under normal working.

5.2 Rear Panel
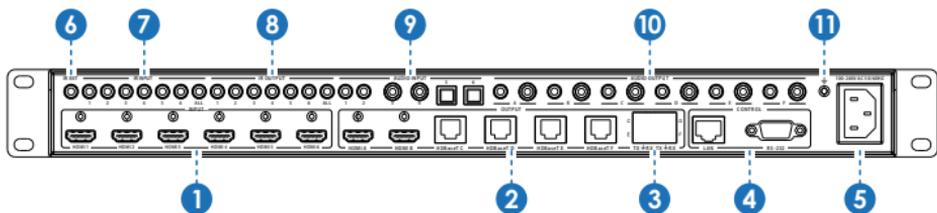
1 **HDMI In:** Connect to HDMI source devices such as Blu-ray DVD or PS4.

2 **2 HDMI and 4 HDBaseT Out:** 2 HDMI out connect to HDMI display devices and 4 HDBaseT connect to the HDBaseT receivers.

3 This is a two-way transmission port. The label C/D/E/F is corresponding to HDBaseT C/D/E/F port. When the port connects another device, you can control the device through PC from RS-232 port on the receiving end. When the port connects PC, you can control far-end device through PC when the device connects the RS-232 port on the receiving end.

4 **LAN and RS-232 Control Port:**
LAN port is for the TCP/IP control; connect to an active Ethernet link with an RJ45 terminated cable.
RS-232 port connects to a PC or control system with DB9 cable for the transmission of RS-232 commands.
The two ports also can be used for upgrading the matrix firmware.

5 **AC Power Input:** Connect to AC power supply.

6 **IR EXT:** If the unit is installed in a closed area out of infrared line of sight, IR EXT port at the rear of unit can extend the matrix control IR by an external IR receiver cable.

7 **IR Input:** Receiving the remote control signal and sending it to Receiver side.

8 **IR Output:** Sending the remote control signal from Receiver side.

Website: www.seada.co.uk   E-mail: sales@seada.co.uk

9 **Audio Input:** Including two 3.5mm analog audio, two coaxial audio and two optical audio inputs.

10 **Audio Output:** Six channels audio output ports, each channel has one 3.5mm analog and one mirrored coaxial audio output.

11 **GND Shielding:** Connect to environment GND for better GND Shielding.

5.3 HDBaseT Receiver Panel
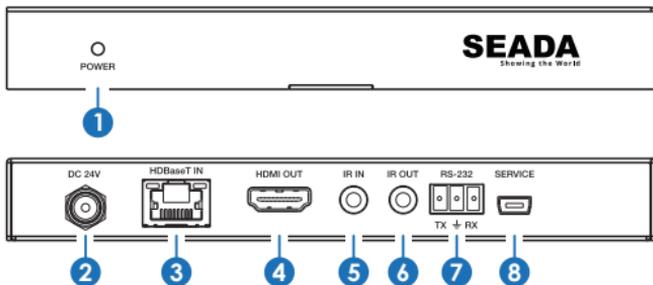
1 **POWER LED:** The LED will illuminate after the receiver is powered on.

2 **DC 24V:** In the matrix system, the jack doesn't be used because of the power from matrix POC output.

3 **HDBaseT IN:** Connect to the matrix HDBaseT output port.

4 **HDMI OUT:** Connect to the display device such as TV or projector.

5 **IR IN:** Connect to an IR receiver cable and the IR signal transmits through the HDBaseT receiver to HDBaseT transmitter.

6 **IR OUT:** Connect to an IR Blaster cable and the IR signal transmits from matrix IR In.

7 **RS-232:** Connect to PC or third-party RS-232 controller to control the matrix or output from matrix's RX-232 C/D/E/F port.

8 **SERVICE:** This port is used to upgrade the firmware of receiver device.

5.4 Matrix Remote Controller Introduction
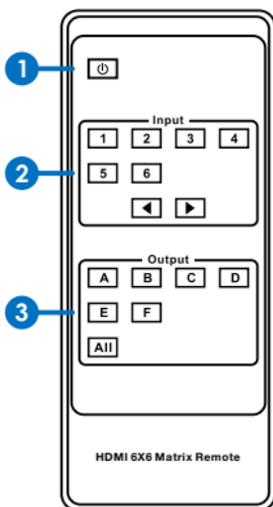
Below introduces the matrix remote controller:

1 **Power button**

Click it the matrix will enter the standby or normal work mode.

2 **Video Input Selection button**

3 **Video Output Selection button**

How to use the video selection button?

Firstly, press the output A/B/C/D/E/F or ALL port

Then press the input 1/2/3/4/5 or 6 port.

For example if you want output C port to input 3, click output "C" button, then
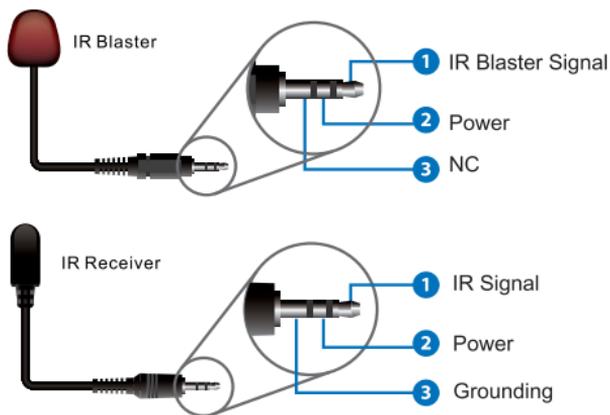
Click input "3" button to complete operation.

5.5 IR Pin Definition
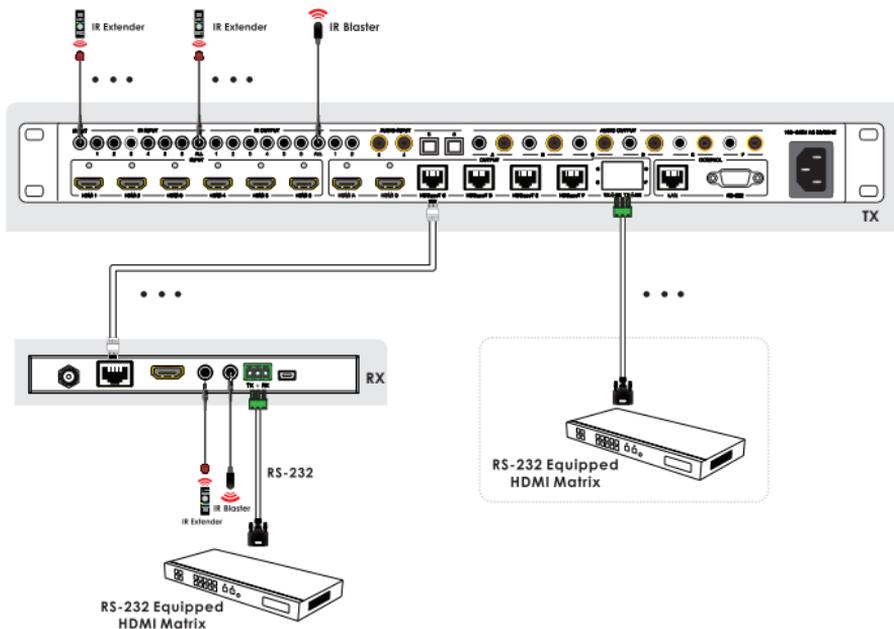
IR Receiver and Blaster pin's definition as below:

IR RECEIVER   **IR BLASTER**

IR Blaster

1 IR Blaster Signal

2 Power

3 NC

IR Receiver

1 IR Signal

2 Power

3 Grounding

5.6 IR and RS-232 Instructions

IR Extender

IR Extender

IR Blaster

TX

RX

RS-232

IR Extender

RS-232 Equipped
HDMI Matrix

RS-232 Equipped
HDMI Matrix

The above connection diagram shows the IR and RS-232 connections:

1. IR Connection:

a.The IR INPUT / OUTPUT (1/2/3/4/5/6) of the matrix is associated with the IR OUTPUT / INPUT of each HDBaseT receiver , and form the IR matrix port together. The logic of the IR matrix follows the video map of the matrix at the same time.

For example: if video HDMI IN1 is selected to HDBaseT OutC,the matrix's IR INPUT1 signal can be output from Receiver's IR out, and Receiver's IR IN can be ouput from the matrix's IR output1,this Receiver is connected with the HDBaseT OutC.

b.IR EXT: This port is used for controlling the matix self.

c.IR ALL IN: This port is used for all HDBaseT Receiver IR out
It means that IR ALL IN port signal can be output from all HDBaseT receiver's IR out

d.IR ALL OUT: This port is used for all HDBaseT Receiver IR in
It means that all HDBaseT receiver's IR in signal can be output from the matrix's this port.

2. RS-232 Connection:

he matrix RS-232 (C/D/E/F) port is corresponding to each HDBaseT receiver's RS-232 port.

For example: The matrix C's RS232 only Be transmitted in both directions from HDBaseT OutC port receiver's RS-232 port.

5.7 Audio Matrix Instructions
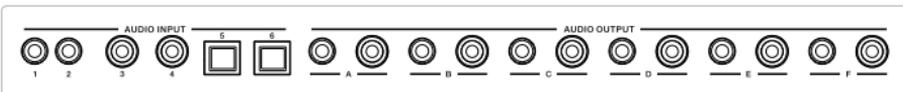
This matrix incorporates an independent audio matrix with 18 audio inputs (including 6 HDMI de-embedding audio, 6 external audio sources and 6 ARC audio), and 12 audio outputs (including 6 HDMI embedding audio to the HDBaseT and HDMI outputs, 6 direct audio breakouts A-F).
In addition, Volume, Mute, Delay for Lip-Sync correction are available on all direct audio outputs (PCM 2.0 audio only).
Audio sample rate supports up to 192 kHz.
Audio Volume is adjustable from 0dB to -50dB.
Delay value is adjustable from 0 to 2000ms.

Note: If you select the ARC audio as audio matrix input source, it doesn't support Volume/Mute/Delay adjustment and just pass-through without any audio processing.
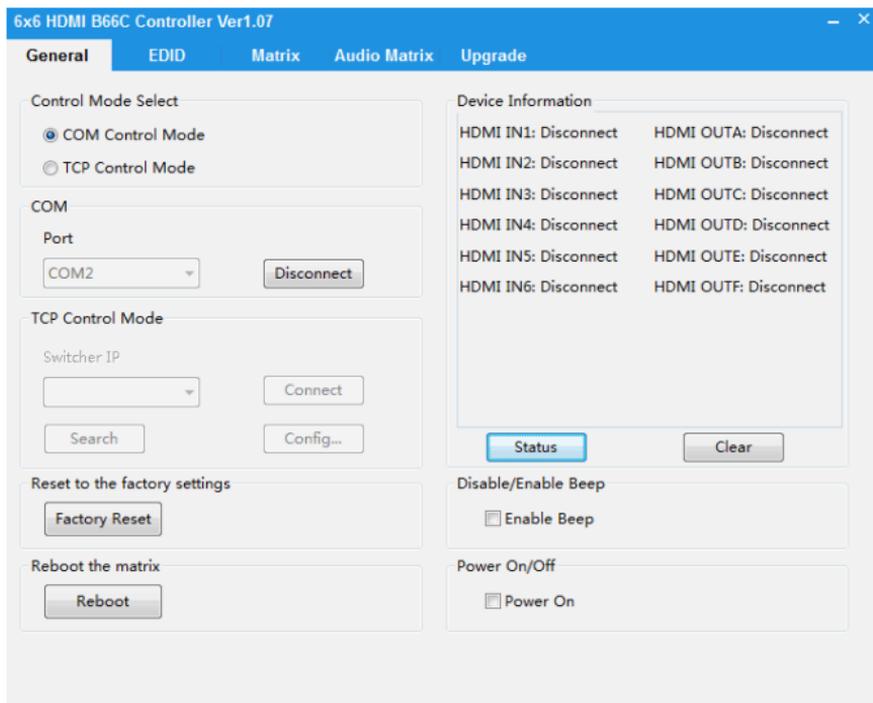
6. PC control software and Web GUI
6.1 PC control software user guide

The matrix can link with the PC control software by UART or TCP/IP mode:
**1.UART mode**
   You need select the "COM Control Mode" in PC control software and the right COM port of your PC or laptop, then click the connection button.

2. TCP/IP mode

   a. The matrix default DHCP is enabling, after powering up 3 minutes if
      network router doesn't assign an IP address to the matrix, it will use an IP
      address (192.168.1.100) as default IP.

  b. The matrix and the PC on the same network IP segment with network
     router and the matrix work on the DHCP status. You need search IP and
     click the connect button.

  c. Configure the IP address manually, you can set others IP address
     and be sure your PC is the same IP segment with Matrix. You can connect
     the matrix via PC host software.
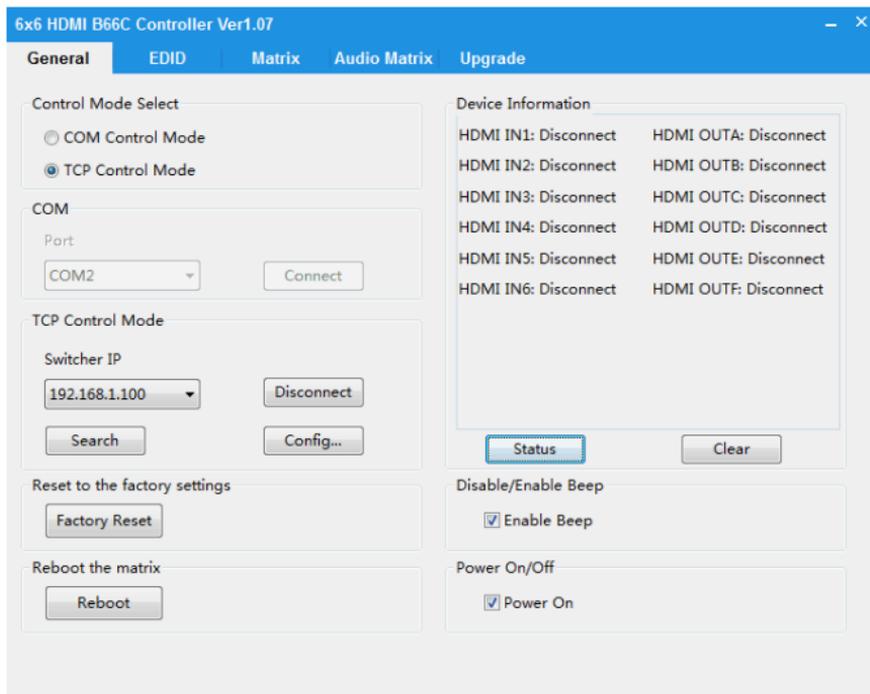
6.2 Web GUI

Before accessing matrix Web GUI, you should know current matrix IP address, you can get it from the front OLED panel "Menu" -> "ViewIP" page. Then you should set the IP address of your PC or laptop or mobile device is within the same IP address segment with the matrix. After above, you can enter the matrix IP address in the web browser to access Web GUI.

Google Chrome, IE and Firefox browser are supported.

Web GUI each page as below:

General

Connection Status
		Status

	1	2	3	4	5	6
Input	no	no	no	no	no	no

	A	B	C	D	E	F
Output	no	no	no	no	no	no

Power ⚪ Beep ⚪ **Reboot** **Factory Reset**

Matrix

OUTPUT A	OUTPUT B	OUTPUT C
IN 1	**IN 2**	**IN 3**
Audio Default ▼	Audio Default ▼	Audio Default ▼
ARC ⚪	ARC ⚪	ARC ⚪

OUTPUT D	OUTPUT E	OUTPUT F
IN 4	**IN 5**	**IN 6**
Audio Default ▼	Audio Default ▼	Audio Default ▼
ARC ⚪	ARC ⚪	ARC ⚪

Audio Matrix

OUTPUT A	OUTPUT B	OUTPUT C
Analog 1 ▼	Coaxial 2 ▼	Coaxial 2 ▼
Delay ms	Delay ms	Delay ms
Vol 100	Vol 100	Vol 100

OUTPUT D	OUTPUT E	OUTPUT F
Coaxial 2 ▼	Coaxial 2 ▼	Coaxial 2 ▼
Delay ms	Delay ms	Delay ms
Vol 100	Vol 100	Vol 100

Sidebar menu items: General, Matrix, Audio Matrix, EDID, Network, Upgrade

EDID

Set EDID Mode	720p, Stereo Audio 2.0	▼	to	IN 1 ▼		Set
Copy EDID From	HDMI OUT A	▼	to	IN 1 ▼		Set
Open EDID File	*Open file...*	▼	to	IN 1 ▼		Set

IN 1: 720p, Stereo Audio 2.0   IN 5: 720p, Stereo Audio 2.0
IN 2: 720p, Stereo Audio 2.0   IN 6: 720p, Stereo Audio 2.0
IN 3: 720p, Stereo Audio 2.0   **Get Status**
IN 4: 720p, Stereo Audio 2.0

Network

Network Configuration

DHCP ⬤   Net Status

IP

Subnet

Gate

Save Changes

Status Log

Clear

Upgrade

Open Upgrade File	*Open file...*	▼	Upgrade

7.Connection Diagram