8x8 HDMI Matrix with Analog Audio Outputs
and 4K-to-1080P Downscalers
B-660-MTRX-8X8

BINARY®

INSTALLATION MANUAL

FC CE

IMPORTANT SAFETY INSTRUCTIONS

To reduce the risk of fire or electric shock, read and follow all instructions and warnings in this manual. Keep this manual for future reference.

1. Do not expose this apparatus to rain or moisture. Do not expose this equipment to dripping or splashing, and ensure that no objects filled with liquids, such as vases, are placed on the equipment. Do not use this apparatus near water.
2. Do not remove cover. No user serviceable parts inside.
3. Clean only with a dry cloth.
4. Do not block any ventilation openings. Install according to manufacturer's instructions.
5. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
6. Do not override the safety purpose of the polarized or grounding plug. A polarized plug has two blades, one of which is wider than the other. A grounding plug has two matching blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
7. Protect the power cord from being walked on or pinched, particularly at the plug end and where the power cord is attached to the apparatus.
8. Only use attachments and accessories specified by the manufacturer.
9. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power supply cord or plug is damaged, liquid has been spilled on or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, the apparatus does not operate normally, or it has been dropped.
10. To completely disconnect this equipment from power, disconnect the power supply cord from the power outlet.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

FCC WARNINGS

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

CONTENTS

1. PRODUCT OVERVIEW

B-660-MTRX-8x8 is an 8x8 HDMI 2.0 Matrix with resolutions supported up to 4K@60Hz 4:4:4 8bit and HDCP 2.2 compatibility. It allows eight sources to be switched to eight HDMI displays simultaneously. The B-660-MTRX-8x8 supports various HDR formats including HDR10, HLG and Dolby Vision up to 4K60, and ARC for residential applications. It also allows for flexible video output in mixed 1080P and 4K TV environments, by providing 4K-to-1080P simple downscaler with each HDMI output. B-660-MTRX-4x4 Matrix can be controlled by IR, RS232 and LAN control with Telnet API and Web UI.

Designed for 1U rack mount and stand-alone installation, this matrix offers an Ultra HD A/V switching and distribution solution ideal for a variety of applications, such as offices, schools, conference rooms, hotels, etc. .

2. FEATURES

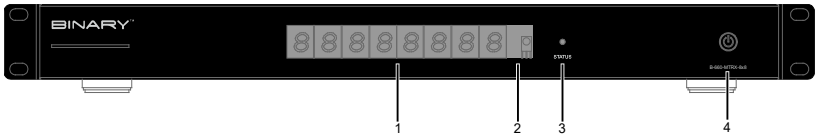
- Includes 8 HDMI inputs and 8 HDMI outputs.
- Inputs and outputs support video resolutions up to 4K@60Hz 4:4:4 8bit and HDCP 2.2.
- Supports 4K@60Hz HDR formats, including HDR10, HLG & Dolby Vision.
- Fast switching among multiple video sources.
- Provides independent 4K-to-1080P simple downscaler with each HDMI output.
- Provides rich audio output modes:
  - > Supports HDMI de-embedded audio from associated HDMI output.
  - > Supports ARC audio return via associated HDMI output(in this case the HDMI output must be connected to TV's HDMI ARC port).
- Provides ready-to-use RCA analog ports for all audio outputs and 5-pin true differential balanced audio ports for audio outputs 7&8.
- Supports IR, RS232 and LAN (Telnet API & Web UI) control options.
- OvrC enabled.

3. PACKAGE CONTENTS

- 1 x B-660-MTRX-8x8 Matrix
- 1 x AC Power Cord with US Pins
- 1 x IR Remote
- 2 x Phoenix Connectors (3.5mm, 5 Pins)
- 1 x Phoenix Connector (3.5mm, 3 Pins)
- 2 x Mounting Brackets (with Screws)
- 1 x Installation Manual

4. DEVICE LAYOUT

4.1. B-660-MTRX-8x8 Front Panel



1. **Output Channel Indicator**

   Indicates input for output port 1-8.
2. **IR Window**

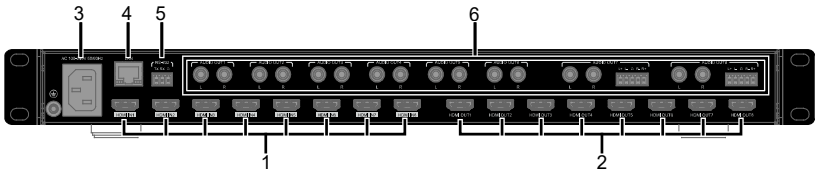
   Receives signals from IR remote.
3. **STATUS LED**

   On: The device is connected to the network.

   Off: No network is connected to the device.
4. **Power Switch**

   Press to power on/off the matrix.

4.2. B-660-MTRX-8x8 Rear Panel



1. **HDMI IN (1-8)**

   Connect to HDMI Sources.
2. **HDMI OUT (1-8)**

   Connect to HDMI displays.
3. **AC 100-240V 50/60Hz**

   Connect the power cord provided. Accepts AC power of 100-240V 50/60Hz.
4. **LAN**

   Connect to a control system for Web UI or Telnet control.
5. **RS-232**

   Connect to a control PC or control system for RS232 serial control.
6. **AUDIO OUT 1-8**

   L/R analog output (1-8): L/R analog audio output. Connect to audio devices via RCA stereo

audio cables;

Phoenix Connector Audio output (7-8): 5 pins, 3.5mm phoenix connector. Connect to audio devices via 5pins, 3.5mm phoenix stereo audio cables.

Note: Audio output ports can be set through web UI or API commands to output HDMI de-embedded audio, or ARC audio from associated HDMI output connected TVs (with ARC function supported, and the CEC function is set to on)

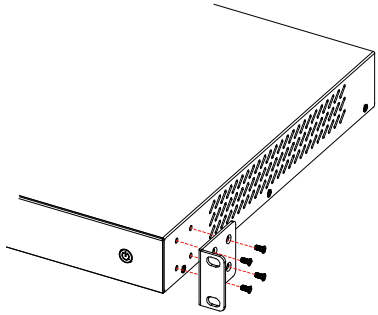
5. INSTALLATION & WIRING

5.1. Installation

B-660-MTRX-8x8 occupies 1U space and can be placed on a solid and stable surface or installed on a standard equipment rack.

Steps to install the matrix on an equipment rack:

1. Attach the installation bracket to the enclosure using the screws provided in the package separately.
2. The bracket is attached to the enclosure as shown.



3. Repeat steps 1-2 for the other side of the unit.
4. Mount and affix the unit in the rack mount with the mounting screws.

5.2. Wiring

Warnings:

- Before wiring, disconnect the power from all devices.
- During wiring, connect and disconnect the cables gently.

Steps for device wiring:

1. **Connect HDMI IN**

   Connect the HDMI sources (such as PC, Blu-ray player, Apple TV, 4K media player, etc) to the HDMI IN 1-8 of the Matrix.

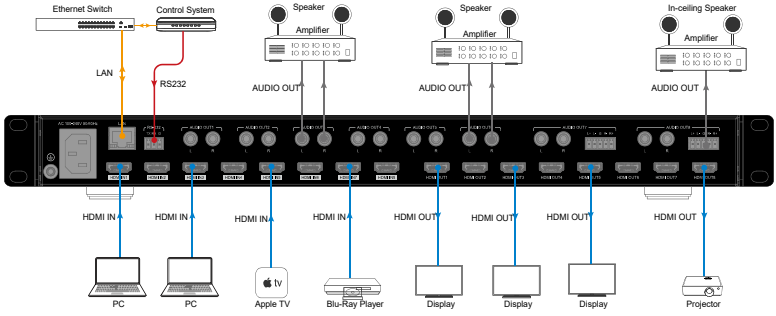
2. **Connect HDMI OUT**

   Connect HDMI display device (such as TV, projector, LED/LCD display) to the HDMI OUT 1-8.

3. **Connect AUDIO OUT**

   Connect audio devices to AUDIO OUT 1-8 of the Matrix (e.g. audio amplifier).

4. **Connect for additional control options:**
   - LAN Control (Telnet/Web UI): Connect a Local Area Network to the LAN port of the Matrix.
   - RS232 Control: Connect a control PC or control system to RS-232 port of the Matrix.
   - IR Control: The IR Remote provided is for controlling the Matrix through IR signal.
5. **Connect the AC power cord provided to the Matrix.**
6. **Power on all attached devices.**



Application Diagram

6. RS232 CONTROL

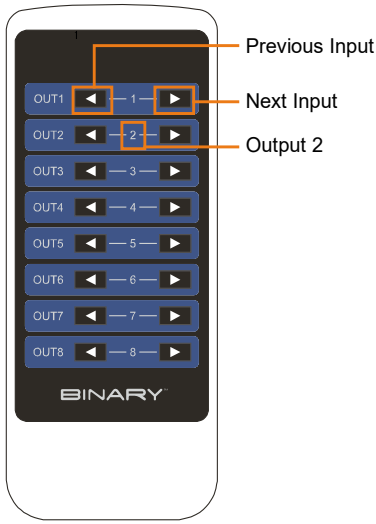
Advanced users may need to control the matrix through RS232 serial communication. Connect a control PC or control system to the RS-232 port of the receiver. API command for RS232 control is available in the separate document “API Command Set_ B-660-MTRX-8x8”. A professional RS232 serial interface software (e.g. Serial Assist) may be needed as well.

Before executing the API command through RS232 serial connection, please ensure RS232 interface of the device and the control PC are configured correctly.

Parameters	Value
Baud Rate	115200 bps
Data Bits	8 bits
Parity	None
Stop Bits	1 bit
Flow Control	None

7. IR REMOTE CONTROL

The Matrix can be controlled by the IR Remote provided. Point the Remote directly to the IR window on front panel of the Matrix. Now you can select input source for each output display.



To select input source for output display:

1. Locate the target output you want to switch inputs for, numbered 1-8 vertically along the right side.
2. Press the previous (◂) or next (▸) button to select the desired input source.

A complete list of hex IR codes can be found in the "B-660-MTRX-8x8_IR Code" file.

8. WEB UI CONTROL

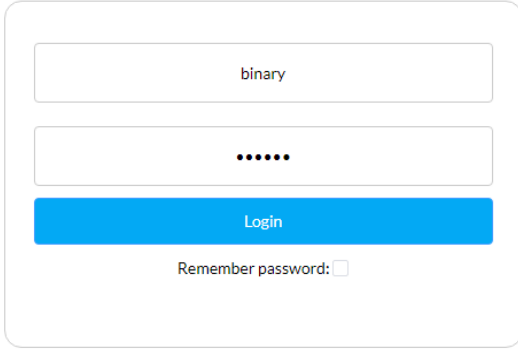
The Web UI designed for the matrix is available for basic controls and advanced settings of the device. The Web UI can be accessed through a browser, e.g. Chrome, Firefox, Safari, Opera, IE, etc..

The default network mode of matrix is DHCP, in this mode, if there's not a DHCP server, the matrix supports for a local 169.254.xxx.xxx IP address.

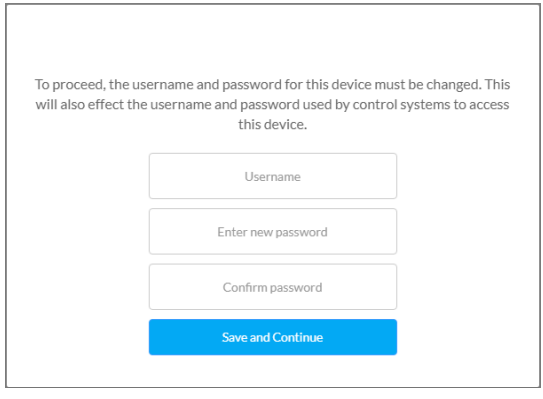
8.1. Get Access to the Web UI

1. Connect the LAN port of the matrix to your PC using a straight UTP cable, or connect the matrix to a local area network, and connect your PC to the same network. Using the later connection, ensure a DHCP server is included in the local area network.

2. Use a tool such as OvrC to search the IP address of the device or send API command to get IP address (More information, see the separate document “API Command Set_B-660-MTRX-8x8”). Set your PC to the same network segment as the matrix if you connect the matrix to your PC directly.
3. Input the IP address in your browser and press Enter. The following window will display.



Enter the Username and Password. The default username and password are both “binary”. Then click “Login”. When login firstly, the following page will be popped up to remind you to change the username and password.



Note:

- The changed username and password must be different from the default username and password.
- Username and Password must be 4 to 16 characters in length, alphanumeric only.

8.2. Web UI Introduction

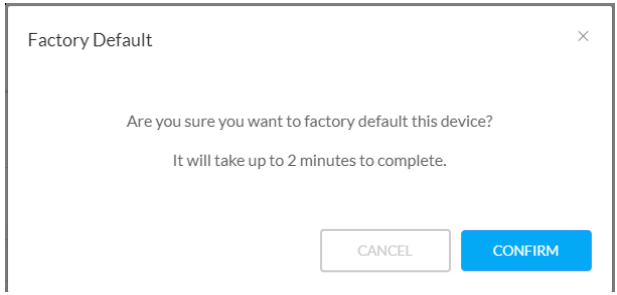
The web UI page includes the following submenus: SIGN OUT, FACTORY DEFAULT, UPDATE and REBOOT on the up-right corner, Matrix Control, Log and System in the main page.

8.2.1. SIGN OUT

Click the icon to return to the login page.

8.2.2. FACTORY DEFAULT

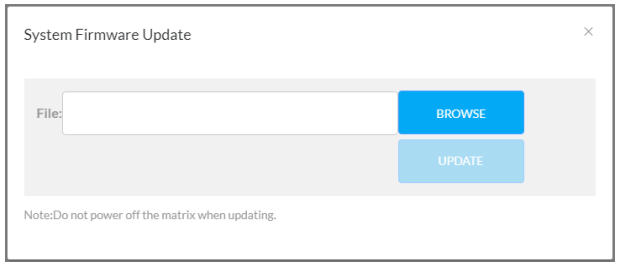
Click the icon, the following window will be popped up, click “CONFIRM” to reset the device to factory default.



Note: Please wait at least 3 minutes to refresh the web page and log in again.

8.2.3. UPDATE

Click the icon, enter the following window.

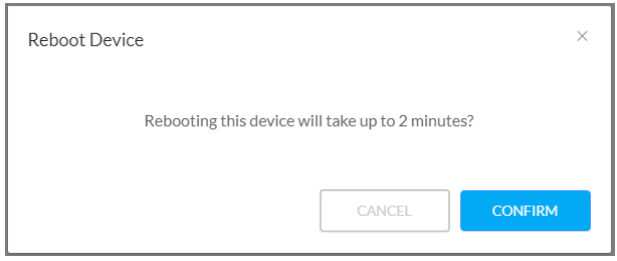


Click “BROWSE” to select the needed upgrade file (“.zip” file is need, you can upload ARM, MCU, or web UI upgrade file), and then click “UPDATE” to upgrade the corresponding firmware.

Note: Do not power off the device when upgrading.

8.2.4. REBOOT

Click the icon, the follwing window will be popped up, click “CONFIRM” to reboot the device.



Note: Please wait at least 2 minutes to refresh the web page and log in again.

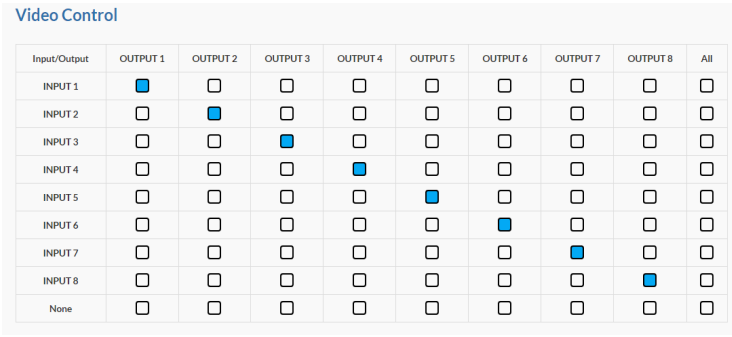
8.2.5. Matrix Control

Move the mouse to “Matrix Control” in the web page, it shows the following sub-menus: Switch and preset, Configuration and Display control. Click the item you want to configure.

1. **Switch and preset**

a. **Video Control**

This section manages distribution of input video sources to output displays. Click the button in the table to select the input for the output display (button turns from white to blue once selection is done).

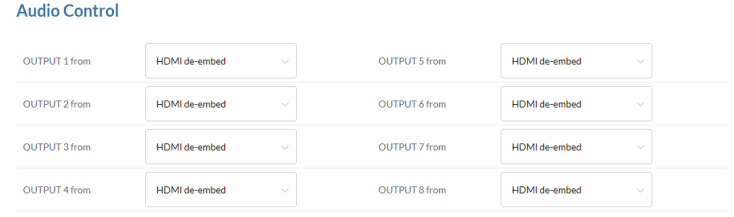


- **All Outputs:** Click to route one input to all outputs.
- **None:** None input is routed to the output (or the output is turned off).

By default, Video Input 1 routes to Output 1, ..., Video Input 7 routes to Output 7, Video Input 8 routes to Output 8.

b. Audio Control

This section allows you to select audio source for each audio output.

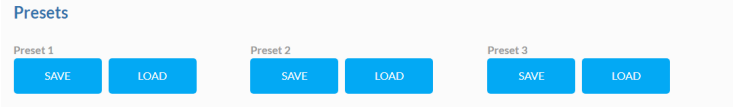


- **HDMI de-embed:** AUDIO OUT port outputs De-embedded audio from the corresponding HDMI OUT port.
- **HDMI ARC:** AUDIO OUT port outputs ARC audio from the corresponding HDMI OUT port.

The default setting for each audio output is HDMI de-embed.

c. Presets

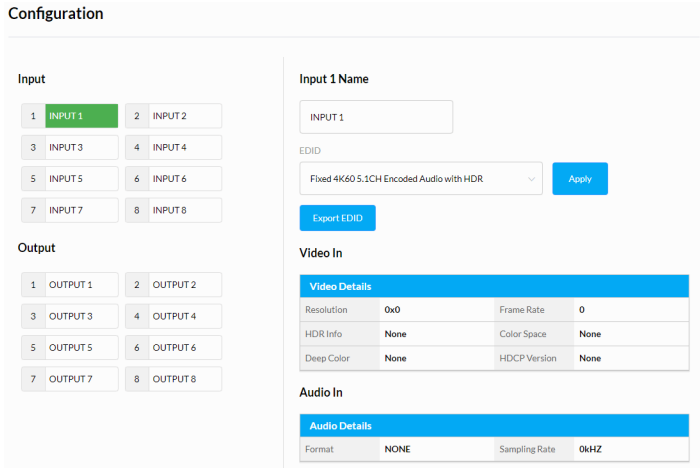
This section saves/loads the input/output switch settings to or from the Matrix.

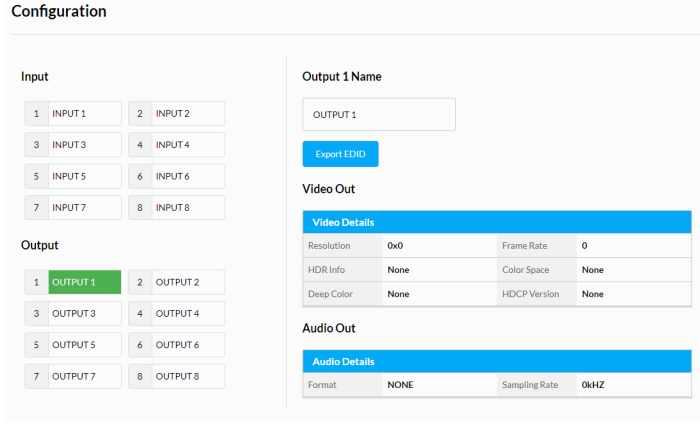


- **SAVE:** Settings in Video Matrix Control section are saved.
- **LOAD:** Preset already saved is loaded.

2. Configuration

This section allows you to change name for each input and output, set EDID for each input, and show video and audio informations for each inputs and outputs.





- **Input/Output:** Select one input/output to set and show its video and audio informations.
- **Input Name/Output Name:** Redefine the input/output names.

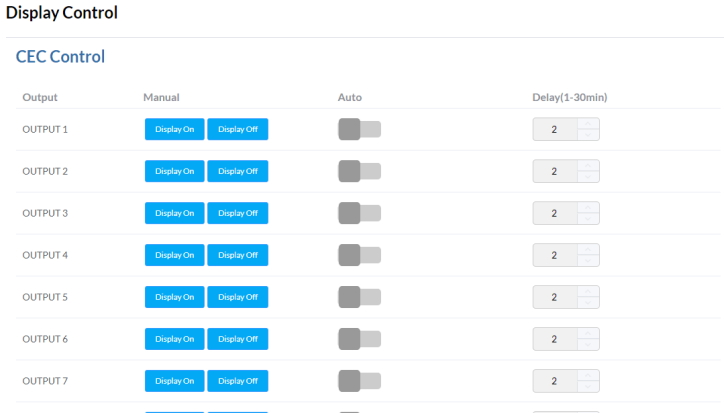
For Input:

- **EDID:** Click to select the EDID for input.
  - > **Apply:** Click to make the EDID setting take effect.
  - > **ExportEDID:** Click to save the EDID information of the selected input port as a bin file to local PC.
- **Video In/Audio In:** Show the video and audio informations for selected inputs.

For Output:

- **ExportEDID:** Click to save the EDID information of the TV connected to the selected output port as a bin file to local PC.
- **Video Out/Audio Out:** Show the video and audio informations for selected outputs.

3. Display Control

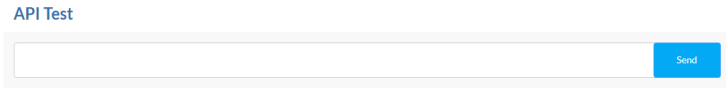


- **Display On:** Click to send the saved Display On command to the connected CEC-enabled display to power on it immediately.
- **Display Off:** Click to send the saved Display Off command to the connected CEC-enabled display to power off it immediately.
- **Auto On/Off:** Click to enable or disable the CEC Auto Control. By default, the auto CEC control is on.
- **Delay Time (1~30min):** Click the up/down arrow to set the time for the display to power off automatically when no signal is present. For example, if Auto control is set as on and the time is set to 2 minutes, the output display will power off automatically when there's no signal at the display for 2 minutes.

8.2.6. Log

1. API Test

This section allows you to input API commands to control the matrix.

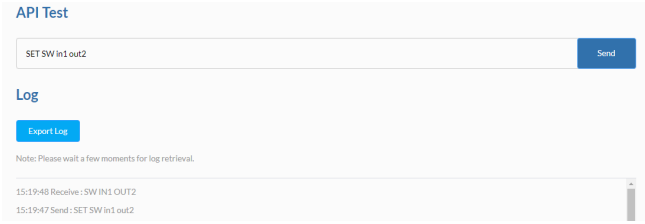


- **Send:** Click to send the command entered to the matrix.

Note:

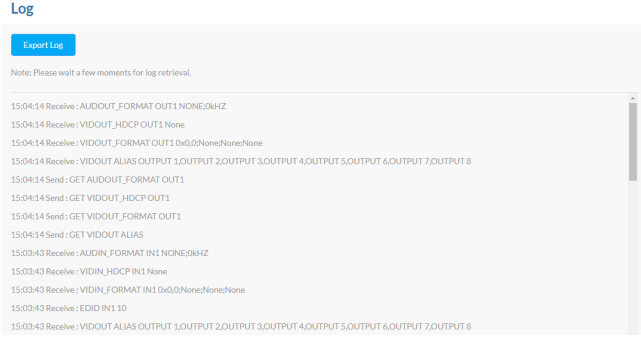
- More API commands, please refer to the separate document "API Command Set_B-660-MTRX-8x8".

- The return information of the sent command will be shown in log box:



2. Log

This section shows the operation log and return information of the tested command.



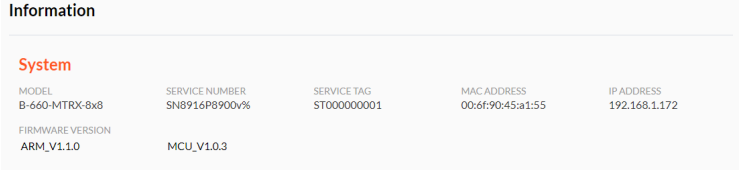
- **Export Log:** Click to export omni log recording information for remote trouble shooting.

8.2.7. System

Move the mouse to “System” in the page, it shows the following sub-menus: Information, Network and Other. Click the item you want to configure.

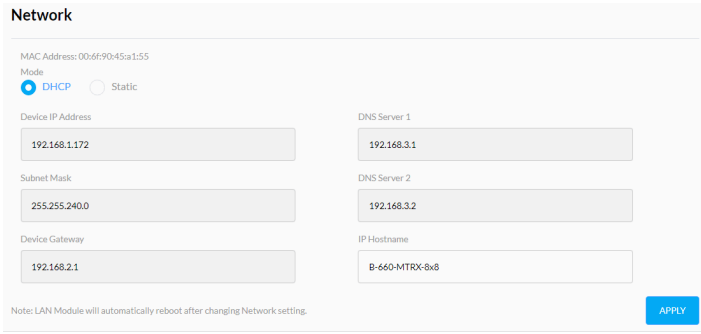
1. Information

This section shows the basic information of the matrix, including MODEL, SERVICE NUMBER, SERVICE TAG, MAC ADDRESS, IP ADDRESS and FIRMWARE VERSION.



2. Network

Network is used to set between the static and dynamic IP address.



- **DHCP:** When enabled, the IP address of the Matrix is assigned automatically by the DHCP server connected.
- **Static:** When enabled, set up the IP address manually.
- **Apply:** Click to enable the network setting.

Note:

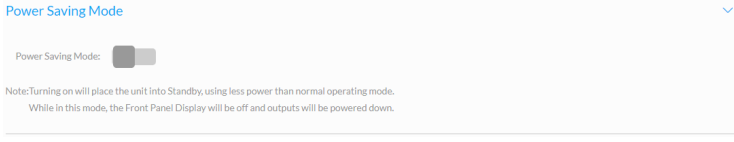
- When "Static" is selected, please ensure your PC is in the same network segment as the Matrix, i.e. the IP address of your PC should be set as 192.168.xxx.xxx.
- Please wait for 2-3 minutes for the Matrix's LAN module to reboot and reconnect after the network setting is changed.

By default, the IP type is set as DHCP. If it doesn't have DHCP server, the matrix supports for local IP address. Use API Command to get the IP address.

3. Other

a. Power Saving Mode

This section allows you to set power saving mode of the matrix to on/off. The default setting is off.



Note: When set Power Saving Mode to on, the matrix will enter standby mode to use less power than normal operation mode. In this mode, the front panel display will be off, and outputs will the powered down.

b. Login Username

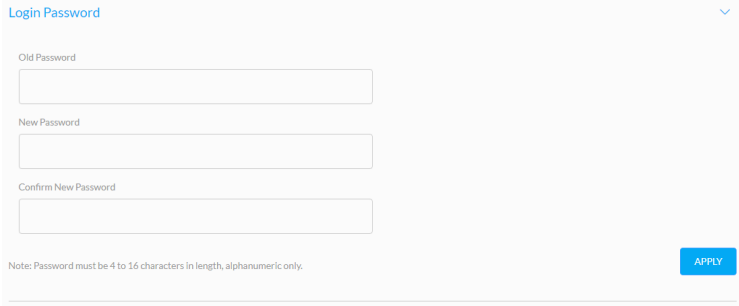
This section is where to change the Username.

- **Apply:** Click to make the setting take effect.

Note: User name must be 4 to 16 characters in length, alphanumeric only.

c. Login Password

This section is where to change Password.



- **Apply:** Click to make the setting take effect.

Note: Password must be 4 to 16 characters in length, alphanumeric only.

9. SPECIFICATIONS

Technical	
Input/Output Port	8 x HDMI IN, 8 x HDMI OUT, 8 x AUDIO OUT (3.5mm analog L/R audio out), 2 x AUDIO OUT (3.5mm 5 Pin Phoenix Connector), 1 x RS-232, 1 x LAN, 1 x AC 100-240V 50/60Hz
Input/Output Signal Type	HDMI with 4K@60Hz 4:4:4, HDR, HLG & Dolby Vision, HDCP 2.2
Input/Output Resolution Supported	VESA: 800x600[8], 1024x768[8], 1280x768[8], 1280x800[8], 1280x960[8], 1280x1024[8], 1360x768[8], 1366x768[8], 1440x900[8], 1600x900[8], 1600x1200[8], 1680x1050[8], 1920x1200[8] SMPTE: 720x576P[6], 1280x720P[6,7,8], 1920x1080P[2,5,6,7,8], 3840x2160[2,3,5,6,8], 4096x2160[2,3,5,6,8] 1 = at 23.98 Hz, 2 = at 24 Hz, 3 = at 25 Hz, 4 = at 29.97 Hz, 5 = at 30 Hz, 6 = at 50 Hz, 7 = at 59.94 Hz, 8 = 60 Hz, 9 = 75 Hz

Technical	
Audio Format	HDMI IN/OUT: Fully supports audio formats in HDMI 2.0 specification, including PCM 2.0/5.1/7.1, Dolby TrueHD, Dolby Atmos, DTS-HD Master Audio and DTS:X L&R Analog AUDIO OUT/3.5mm 5 Pins AUDIO OUT: Stereo
Maximum Data Rate	HDMI IN & HDMI OUT: 18Gbps
Control Method	IR, RS-232, CEC, Network Control (Telnet & Web UI)

General	
Operating Temperature	0°C to 40°C (32°F to 104°F)
Storage Temperature	-20°C to 60°C (-4°F to 140°F)
Humidity	10% to 90%, non-condensing
ESD Protection	Human-body Model: ±15kV (Air-gap discharge)
Power Supply	AC 100-240V 50/60Hz
Power Consumption (Max)	31W
Device Dimension (W x H x D)	440mm x 43.5mm x 300mm/17.32" x 1.71" x 11.81" (without mounting brackets)
Product Weight	3.65kg/8.05lb
Rack Space Required	1U

9.1. Transmission Distance

Cable Type	Range	Supported Video
HDMI	Input/Output: 15m/49ft	1080P@60Hz
	Input/Output: 10m/33ft	4K@30Hz
	Input/Output: 5m/16ft	4K@60Hz

10. WARRANTY

2-Year Limited Warranty

This Binary product has a 2-Year limited warranty. This warranty includes parts and labor repairs on all components found to be defective in material or workmanship under normal conditions of use. This warranty shall not apply to products that have been abused, modified or disassembled. Products to be repaired under this warranty must be returned to SnapOne or a designated service center with prior notification and an assigned return authorization number (RA).

11. SUPPORT

Need Help? Contact Tech Support!

If you need further clarification, please call tech support at (**866) 838-5052**, or email **techsupport@snapone.com**. For other information, instructional videos, support documentation, or ideas, visit our website and view your item's product page at **www.snapone.com**.

BINARY®

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