BZBGEAR®
Amplify Your World™

BG-4K-1616MA

16X16 4K UHD HDMI 2.0 Matrix Switcher with Audio De-embedding/Independent Routing and IR Matrixing (4K60 - 4:4:4 and HDR Support)

User Manual

TABLE OF CONTENTS

Statement

Please read these instructions carefully before connecting, operating, or configuring this product. Please save this manual for future reference.

Safety Precaution

- To prevent damaging this product, avoid heavy pressure, strong vibration, or immersion during transportation, storage, and installation.
- The housing of this product is made of organic materials. Do not expose to any liquid, gas, or solids which may corrode the shell.
- Do not expose the product to rain or moisture.
- To prevent the risk of electric shock, do not open the case. Installation and maintenance should only be carried out by qualified technicians.
- Do not use the product beyond the specified temperature, humidity, or power supply specifications.
- This product does not contain parts that can be maintained or repaired by users. Damage caused by dismantling the product without authorization from BZBGEAR is not covered under the warranty policy.
- Installation and use of this product must strictly comply with local electrical safety standards.

Introduction

The BG-4K-1616MA 4K 16×16 HDMI Matrix delivers powerful and flexible AV distribution, allowing up to sixteen HDMI™ sources to be independently routed to sixteen HDMI™ displays with crystal-clear video up to 4K@60Hz 4:4:4 and 18Gbps bandwidth. It supports advanced HDR formats including HDR10, HDR10+, Dolby Vision LLM, and HLG, and features independent audio switching with both analog and optical digital audio de-embedding from HDMI™ inputs or ARC return audio. Each output supports 4K-to-1080p downscaling, ensuring compatibility across mixed-resolution displays. Designed for professional installations, this unit is HDCP 2.2 compliant, supports CEC and smart EDID management, and offers multiple control options including front panel, IR remote, RS-232, LAN, and Web GUI—all housed in a 1U rack-mountable chassis with a front LCD display.

Features

- **HDCP 2.2 Compliance:** Ensures secure content protection for compatibility with the latest 4K UHD sources and displays
- **18Gbps Bandwidth Support:** Delivers ultra-high performance for uncompressed 4K HDR video transmission
- **4K60 4:4:4 Video Resolution:** Supports up to 4K2K@60Hz with full chroma sampling as defined by HDMI™ 2.0b
- **Advanced HDR Format Pass-Through:** Compatible with HDR, HDR10, HDR10+, Dolby Vision LLM, and HLG for lifelike color and contrast
- **Independent Audio and Video Routing:** Allows separate switching of HDMI™ audio and video signals for flexible integration
- **Per-Output 4K to 1080p Downscaling:** Provides automatic resolution downscaling on each output without altering frame rate
- **High-Definition Audio Support:** Supports HDMI™ audio formats up to 7.1-channel high-definition surround sound
- **Integrated Audio De-Embedding:** Extracts audio from HDMI™ inputs or ARC and outputs through Coaxial ports
- **ARC, CEC, and Smart EDID Management:** Enhances system compatibility and simplifies device communication and configuration
- **Multiple Control Options:** Easily operate via front panel buttons, IR remote, RS-232, LAN, or intuitive Web GUI
- **Professional Rack-Mount Design:** 1U chassis with front-panel LCD for easy installation and real-time system status monitoring

Packing List

- 1× BG-4K-1616MA
- 1× 24V/5A Power Adapter with US AC Power Cord
- 1× IR Remote
- 1× IR Wideband Receiver Cable (1.5m)
- 1× RS-232 Serial Cable (1.5m, male to female head)
- 8× Machine Screw (KM3*6)
- 2× Mounting Ear
- 1× User Manual

Specifications

Technical	
HDMI™ Compliance	HDMI™ 2.0b
HDCP Compliance	HDCP 2.2
Video Bandwidth	18Gbps
Video Resolution	Up to 4K60Hz 4:4:4
All available resolutions are shown in the table below	
Color Space	RGB, YCbCr_4:4:4, YCbCr_4:2:2, YCbCr_4:2:0
Color Depth	8/10/12-bit
HDR Formats	HDR, HDR10, HDR10+, Dolby Vision LLM, HLG
Audio Formats	
HDMI™ IN/OUT	LPCM, Dolby Digital/Plus/EX, Dolby True HD, Dolby Atmos, DTS, DTS-EX, DTS-96/24, DTS High Res, DTS-HD Master Audio, DSD
AUDIO BREAKOUT (Optical outputs)	Up to LPCM/Dolby/DTS 5.1CH
AUDIO BREAKOUT (Analog Audio Outputs)	LPCM 2CH (sample rate 32~192kHz)
Connection	
Input ports	16× INPUT [HDMI™ Type A, 19-pin female]
Video output ports	16× OUTPUT [HDMI™ Type A, 19-pin female]
Audio output ports	16× AUDIO OUT [RCA]
Control ports	
Network	1 × TCP/IP [RJ45]
Serial	1 × RS-232 [D-Sub9]
IR	1 × IR EXT [3.5mm audio jack]
Mechanical	
Housing	Metal Enclosure

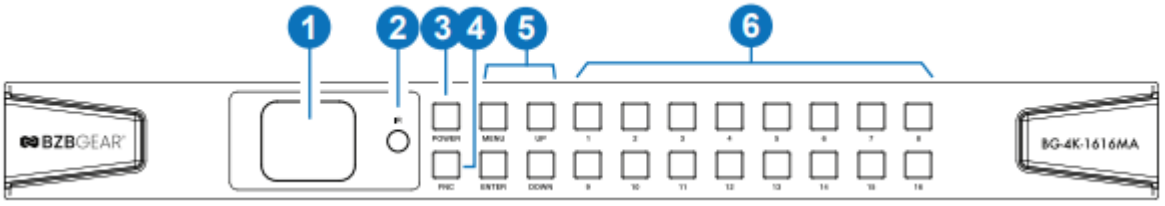
Color	Black
Dimensions	17in × 10in × 1.8in / 440mm [W] × 256mm [D] × 44.5mm [H]
Weight	11 lbs [4.9kg]
Power Supply	Input: AC 100 - 240V 50/60Hz, Output: DC 24V/5A (US/EU standard, CE/FCC/UL certified)
ESD Protection	IEC 61000-4-2: ±8kV (Air-gap discharge) & ±4kV (Contact discharge)
Power Consumption	99.6W (Max)
Operating	
Temperature	32 - 104°F / 0 - 40°C
Storage Temperature	-4 - 140°F / -20 - 60°C
Operating Humidity	20%~80% relative humidity, non-condensing
Storage Humidity	10%~90% relative humidity, non-condensing
HDMI™ Cable Length (IN / OUT)	**4K60:** 5m/16ft **4K30:** 10m/33ft **1080P:** 15m/49ft
Note: The use of “Premium High Speed HDMI™” cable is highly recommended.	

Support Resolution and Refresh Rates

Resolution Category	Supported Resolutions & Refresh Rates
PC / VESA	640×480p60, 800×600p60, 1024×768p60, 1280×1024p60, 1360×768p60, 1440×900p60, 1440×1050p60, 1600×1200p60
SD	720×480i/p59.94, 720×576i/p50
HD (720p)	1280×720p50/59.94/60
Full HD (1080)	1920×1080i50/59.94/60, 1920×1080p23.98/24/25/29.97/30/50/59.94/60
UHD (3840×2160)	2160p23.98/24/25/29.97/30/50/59.94/60
DCI 4K (4096×2160)	23.98/24/25/29.97/30/50/59.94/60

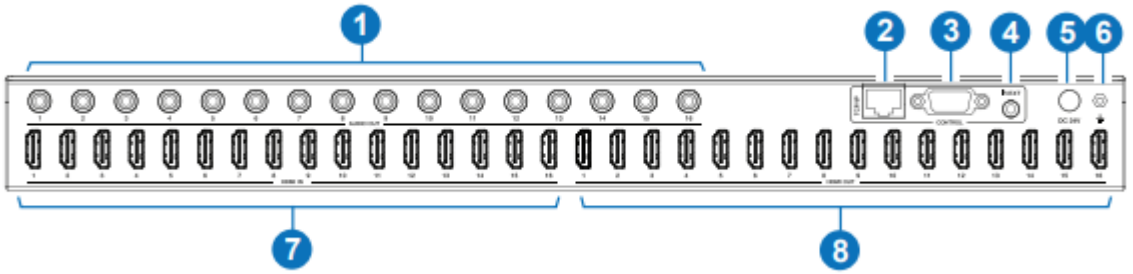
Operation Controls and Functions

Front Panel



NO.	Name	Function Description
1	LCD screen	Display matrix switching status, input / output port, EDID, baud rate, IP Address, etc.
2	IR	IR signal receiver. Receiving the signal from the IR remote.
3	POWER button & indicator	Press the button to power on the device, and at this time the light is blue. Long-press the button for 3 seconds to enter the standby mode, and at this time the light is red.
4	FNC	Multi-function button. FNC + Number (1~16): Select the input source for all output channels. Number (1~16) means the input source (1~16). FNC + FNC + 1: Display IP address. FNC + FNC + 2: Display the baud rate of serial port. Note: The info above will disappear automatically in 3 seconds.
5	MENU / ENTER / UP / DOWN	Screen operation buttons. Take RESET, for example. ① On the initial LCD display screen, press “MENU” button. There are OUTPUT SETTINGS/INPUT SETTINGS/AUDIO BREAKOUT/SETUP/FIRMWARE items to be selected. ② Press the “UP/DOWN” button to select SETUP item. ③ Press the “ENTER” button to enter into the next level. There are LCD ONTIME/BAUDRATE/NETWORK/REBOOT/RESET items to be selected. ④ Press the “UP/DOWN” button to select RESET item. ⑤ Press the “ENTER” button, and it will prompt to confirm. Now press "FNC" to continue, or press "MENU" to return.Note: Pressing the “MENU” button will return to the previous menu on any page.
6	INPUT / OUTPUT (1~16) buttons	Press a number (1~16) firstly to select an output channel, and then press a number (1~16) to select the corresponding input source.

Rear Panel



NO.	Name	Function Description
1	AUDIO OUT (1~16)	Digital audio output port, connected to an audio device such as speaker.
2	TCP/IP	TCP/IP control port, connected to PC or router with an RJ45 cable.
3	RS-232 port	Connects to a PC or control system to control the matrix.
4	IR EXT	Connects to a 12V wideband IR receiver cable. If the IR receiver window of the unit is blocked or the unit is installed in a closed area out of infrared line of sight, the IR receiver cable can be inserted to the “IR EXT” port to receive the IR remote signal.
5	DC 24V	Connects to 24V/5A power supply.
6	GND	Connects the housing to the ground.
7	HDMI IN (1~16)	HDMI signal input ports, connected to HDMI source device such as PC, DVD or set-top box with HDMI cable.
8	HDMI OUT (1~16)	HDMI signal output ports, connected to HDMI display device such as TV or monitor with an HDMI cable.

Note:

1. You can restore the factory settings via the front panel, web, or RS-232 command.
2. The power cut memory function is available except for the standby status.
3. The RS-232 and Web will be available in a few minutes when the device is powered on.

LCD Display Navigation

The buttons on the front panel are used for navigating the LCD, including INPUT/OUTPUT (1~16), MENU, ENTER, UP, DOWN, POWER, and FNC. Menu contents are as follows:

Level 1	**Level 2**	**Level 3**	**Level 4**
INPUT SETTINGS	EDID	INPUT 1–16	1. 1080P60 2.0CH; 2. 1080P60 5.1CH; 3. 1080P60 7.1CH; 4. 4K30 2.0CH; 5. 4K30 5.1CH; 6. 4K30 7.1CH; 7. 4K60(420) 2.0CH; 8. 4K60(420) 5.1CH; 9. 4K60(420) 7.1CH; 10. 4K60(444) 2.0CH; 11. 4K60(444) 5.1CH; 12. 4K60(444) 7.1CH; 13. 4K30_HDR 2.0CH; 14. 4K30_HDR 5.1CH; 15. 4K30_HDR 7.1CH; 16. 4K60(420)_HDR 2.0CH; 17. 4K60(420)_HDR 5.1CH; 18. 4K60(420)_HDR 7.1CH; 19. 4K60(444)_HDR 2.0CH; 20. 4K60(444)_HDR 5.1CH; 21. 4K60(444)_HDR 7.1CH; 22–24. User Defined 1~3; 25–40. Copy Output 1~16
OUTPUT SETTINGS	MODE	OUTPUT 1–16	BYPASS / 4K to 1080P / AUTO / AUDIO ONLY
OUTPUT SETTINGS	HDR	OUTPUT 1–16	BYPASS / HDR to SDR / AUTO
OUTPUT SETTINGS	ARC	OUTPUT 1–16	ON / OFF
OUTPUT SETTINGS	STREAM	OUTPUT 1–16	ON / OFF
OUTPUT SETTINGS	AV MUTE	OUTPUT 1–16	ON / OFF
OUTPUT SETTINGS	AUDIO	OUTPUT 1–16	EMBEDDED / INPUT 1~16
AUDIO BREAKOUT	ON/OFF	OUTPUT 1–16	ON / OFF

AUDIO BREAKOUT	MODE	—	FOLLOW INPUT / FOLLOW OUTPUT
MATRIX	MATRIX OUTPUT	OUTPUT 1–16	Select INPUT 1–16
SETUP	LCD ONTIME	—	OFF / ALWAYS ON / 15s / 30s / 60s
SETUP	BAUDRATE	—	4800 / 9600 / 19200 / 38400 / 57600 / 115200
SETUP	NETWORK	—	DHCP ON/OFF; 192.168.0.100; 255.255.0.0; 192.168.0.1
SETUP	REBOOT	—	—
SETUP	RESET	—	—
SETUP	FIRMWARE	—	—

IR Remote Guide

Power & Presets

OFF / ON
Press to power the device on or off.

P1 / P2 / P3 / P4 / P5 / P6 / P7 / P8
Press to recall the corresponding saved preset.

Navigation & Menu Control

HOME / ▲ / ▼ / ◄ / ► / OK
Use these keys to operate and navigate the on-screen LCD menu.

A/F Multifunction Button

The **A/F** button is used to access advanced functions:

- **A/F + 1–16**: Sends input source 1–16 to all outputs
- **A/F + A/F + 1**: Displays the device IP address on the LCD screen
- **A/F + A/F + 2**: Displays the RS-232 baud rate on the LCD screen

Note:
Use the **-/--** button to select channel numbers greater than 9.
Example: Channel 16 = press **-/--**, then **6**.

Video Switching

Switching a Single Output to a Selected Input

OUT + Output Number (1–16) → IN + Input Number (1–16)

1. Press **OUT**
2. Press the output channel number you want to assign
3. Press **IN**
4. Press the input source number

Example:
Press **OUT + 1**, then **IN + 2**
This routes **Input 2 → Output 1**

Switching All Outputs Simultaneously

OUT + ALL → IN + Input Number (1–16)

Example:
Press **OUT + ALL**, then press **IN + 1**
All outputs will receive **Input 1**.

Audio Switching

Audio switching follows the same steps as video switching, but begins with the **A/F** button.

A/F → OUT + Output Number (1–16) → IN + Input Number (1–16)

Example:
Press **A/F**, then **OUT + 1**, then **IN + 2**
This routes **Audio Input 2 → Audio Output 1**

IR Remote Usage Range

The Matrix supports IR remote input switching. The remote can receive IR commands in two ways:

- **Direct alignment (straight line to IR window): up to 8 meters**
- **At a 45° angle to the IR window: up to 5 meters**

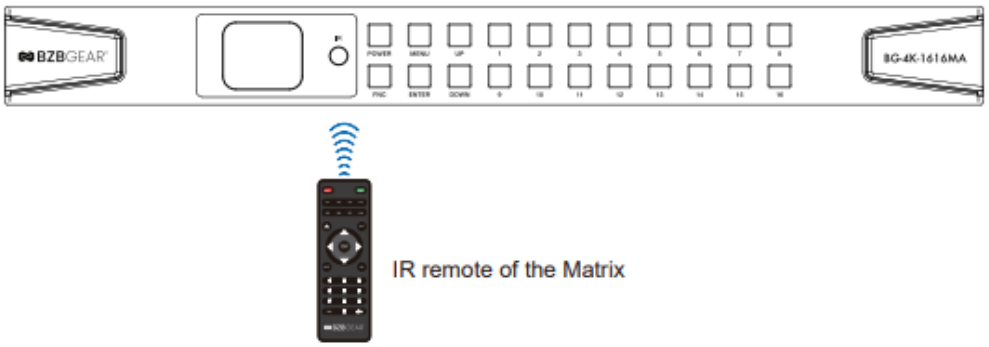
For best results:

- Aim the remote toward the device's IR window
- Avoid obstructions blocking IR signal
- Do not operate in direct strong light environments when possible

IR Remote Signal Reception Methods

The matrix can be controlled using the included IR remote in two ways:

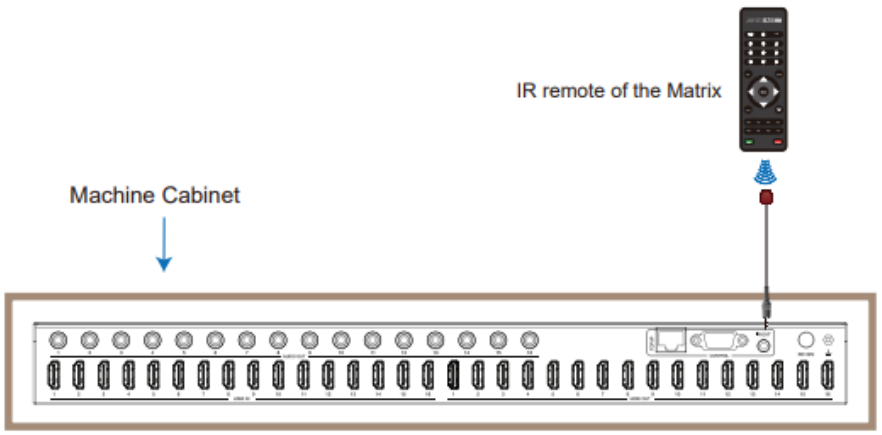
Method 1: Built-in IR Receiver



The front-panel IR window receives signals directly from the IR remote.

- Maximum operating distance: **up to 8 meters** when the remote is aimed directly at the matrix
- Operating distance at a 45° angle: **up to 5 meters**
  Refer to the diagram below for the effective IR range.

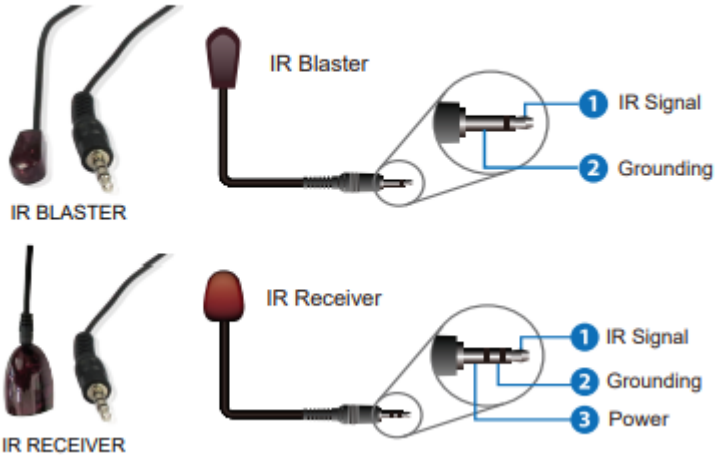
Method 2: External IR Receiver (IR EXT Port)



If the matrix's IR window is obstructed or the unit is installed in an enclosed area without a clear infrared line of sight, an external IR receiver cable can be connected to the **IR EXT** port.

- Maximum operating distance: **up to 5 meters** when the remote is aimed directly at the IR receiver head
- Operating distance at a 45° angle: **up to 3 meters**
  Refer to the diagram below for the effective IR range.

IR Cable Pin Assignment

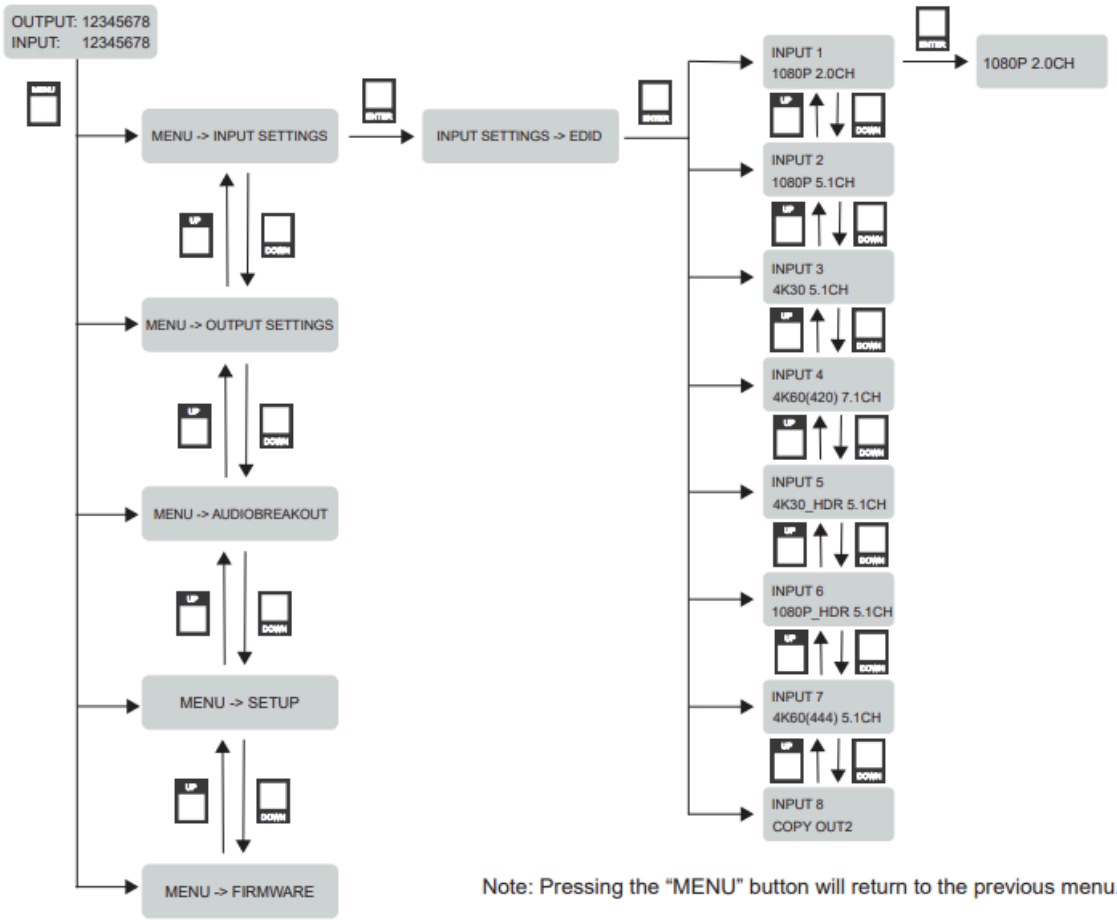


EDID Management

This Matrix provides **36 factory-preset EDID settings**, **3 user-defined EDID modes**, and **8 EDID copy modes**. EDID modes can be assigned to each input port using the **front panel buttons**, **RS-232 control**, or the **Web GUI**.

Front Panel EDID Configuration

1. From the default LCD screen, press **MENU** to enter the main menu.
2. Use the **UP / DOWN** buttons to select **Input Settings**, then press **ENTER**.
3. Select **EDID**, then press **ENTER**.
4. Use the **UP / DOWN** buttons to choose the desired EDID mode for the selected input.
5. Press **ENTER** to confirm and apply the setting.



Note: Pressing the "MENU" button will return to the previous menu.

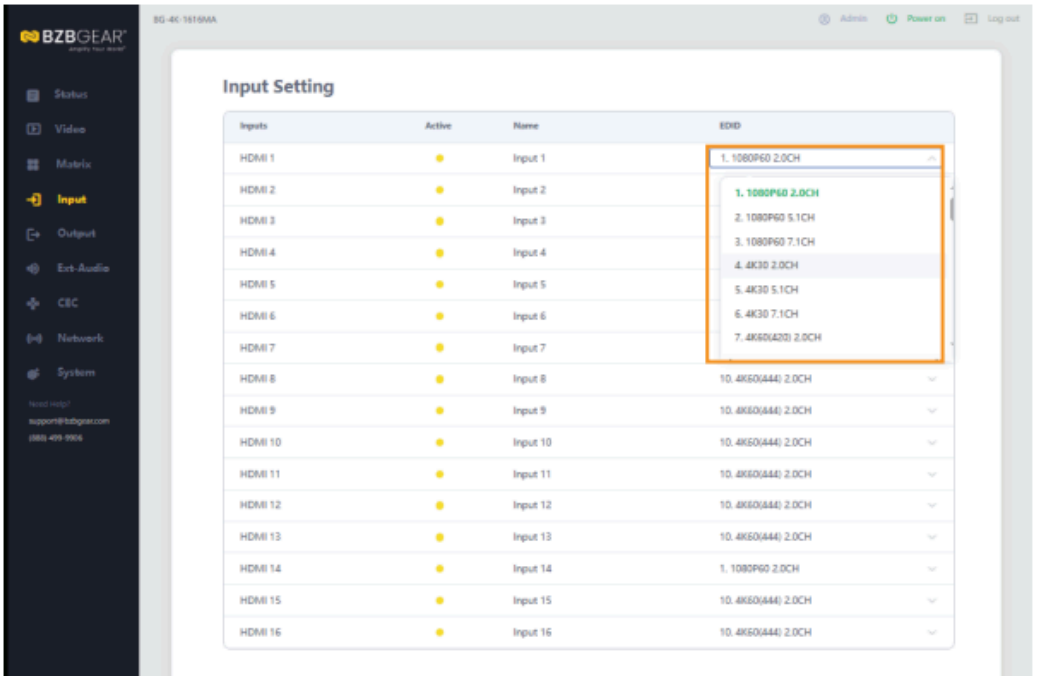
RS-232 EDID Configuration

1. Connect the Matrix to a PC using an RS-232 serial cable.
2. Open a serial command utility on the PC.
3. Send the ASCII command:
   `s input x EDID z!`
   to assign an EDID to the selected input.

4. For command syntax and parameter definitions, refer to **"EDID Setting"** in the **RS-232 Control Command (ASCII Command List)**.

Web GUI EDID Configuration

EDID settings can also be managed through the Web GUI.
Navigate to the **Input** page in the **Web GUI User Guide** and use the EDID management options to configure the desired input.



The defined EDID setting list of the product is shown as below:

EDID Mode	EDID Description	EDID Mode	EDID Description
1	1080P60, 2.0CH	21	4K60(444)_HDR, 7.1CH
2	1080P60, 5.1CH	22	User Defined 1
3	1080P60, 7.1CH	23	User Defined 2
4	4K30, 2.0CH	24	User Defined 3
5	4K30, 5.1CH	25	Copy Output 1
6	4K30, 7.1CH	26	Copy Output 2
7	4K60(420), 2.0CH	27	Copy Output 3
8	4K60(420), 5.1CH	28	Copy Output 4
9	4K60(420), 7.1CH	29	Copy Output 5

10	4K60(444), 2.0CH	30	Copy Output 6
11	4K60(444), 5.1CH	31	Copy Output 7
12	4K60(444), 7.1CH	32	Copy Output 8
13	4K30_HDR, 2.0CH	33	Copy Output 9
14	4K30_HDR, 5.1CH	34	Copy Output 10
15	4K30_HDR, 7.1CH	35	Copy Output 11
16	4K60(420)_HDR, 2.0CH	36	Copy Output 12
17	4K60(420)_HDR, 5.1CH	37	Copy Output 13
18	4K60(420)_HDR, 7.1CH	38	Copy Output 14
19	4K60(444)_HDR, 2.0CH	39	Copy Output 15
20	4K60(444)_HDR, 5.1CH	40	Copy Output 16

Web GUI User Guide

The Matrix supports control via Web GUI. The operation procedure is as follows:

Step 1: Obtain the IP Address

The default IP address of the Matrix is **192.168.0.100**. The current IP address can be obtained using one of the following methods:

Method A: Front Panel Operation

1. From the LCD home screen, press **MENU** to enter the main menu.
2. Press **UP / DOWN** to select **SETUP**, then press **ENTER**.
3. Press **UP / DOWN** to select **NETWORK**, then press **ENTER**.
4. The current IP address is displayed.

Method B: RS-232 Command

1. Connect the Matrix to a PC via RS-232.
2. Open an ASCII command tool on the PC.
3. Send the following command:

```
None

r ipconfig!
```

4. The Matrix will return the network information, including the IP address, as shown below:

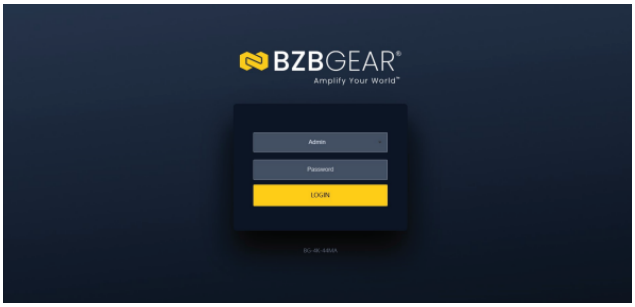
```
None

IP Mode: Static
IP: 192.168.0.100
Subnet Mask: 255.255.255.0
Gateway: 192.168.0.1
TCP/IP Port: 8000
Telnet Port: 23
MAC Address: 00:1C:91:03:80:01
```

Note: The IP address may vary depending on the unit's network configuration. Refer to **RS-232 Control Command** for detailed ASCII command information.

Step 2: Network Setup

Connect the Matrix TCP/IP port to a PC using a UTP (Ethernet) cable.
Set the PC IP address to the same network segment as the Matrix.

Step 3: Web GUI Login

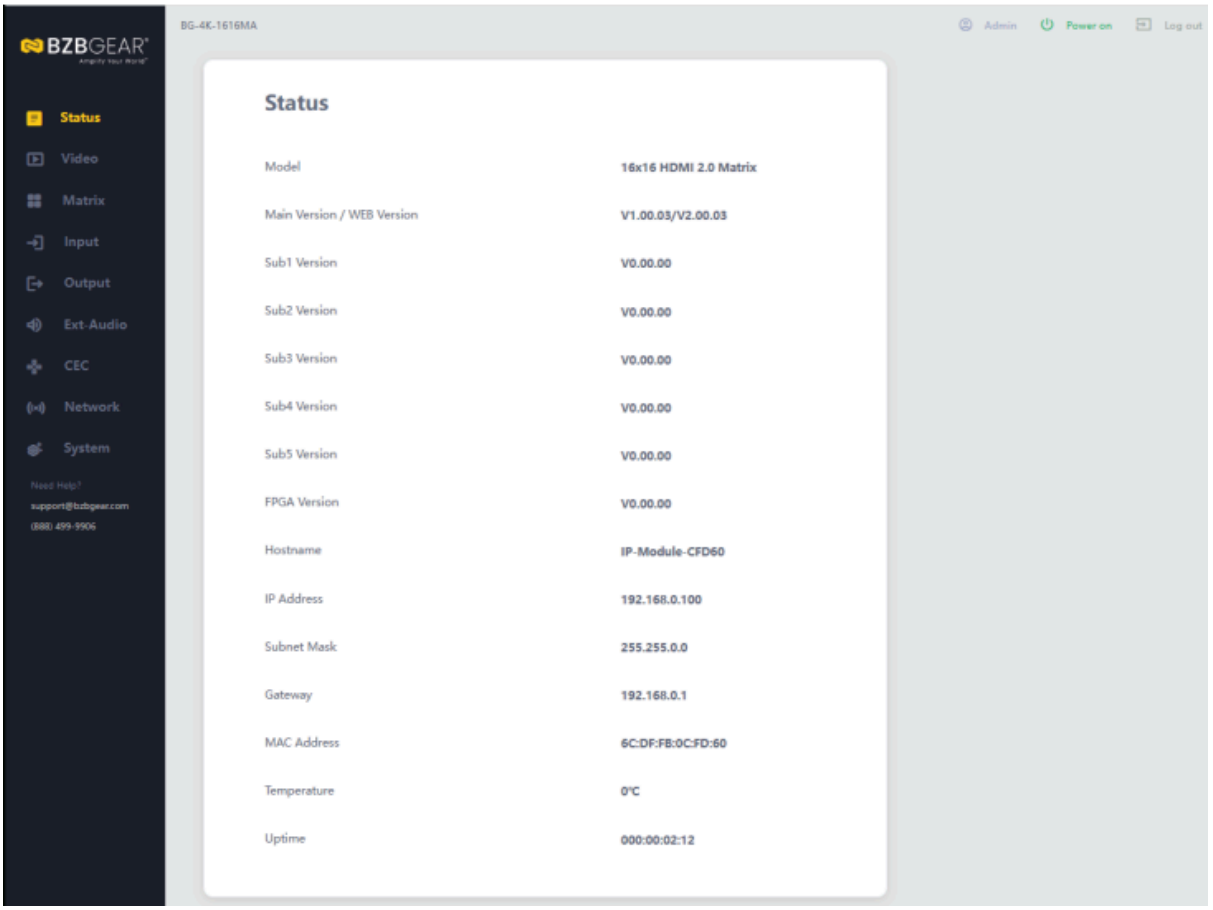


1. Open a web browser on the PC.
2. Enter the Matrix IP address in the address bar.
3. The Web GUI login page will be displayed.

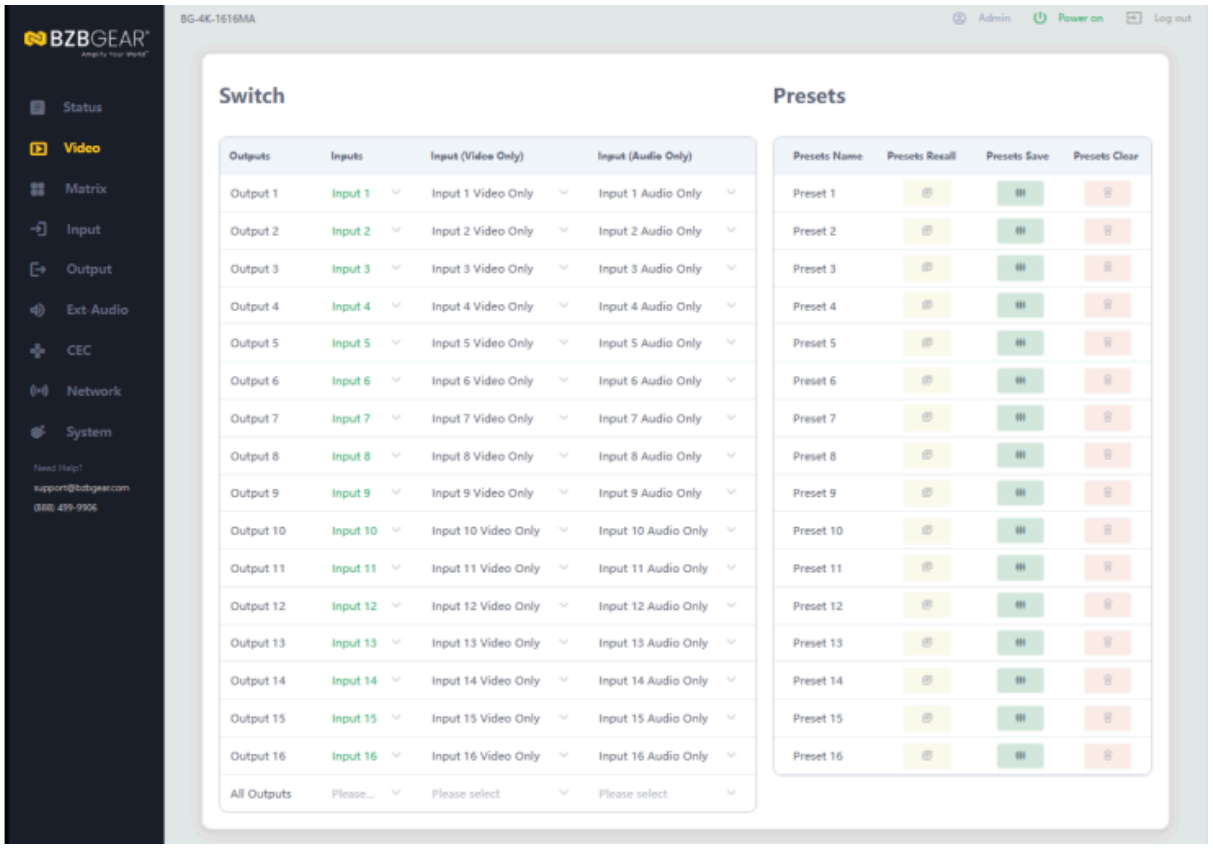
Select the username **“Admin”** and enter the password **“admin.”** Then click the **“LOGIN”** button. The Status page will appear.

Status Page

The Status page provides basic information about the Model, the installed firmware version and the network settings of the device



Video Page



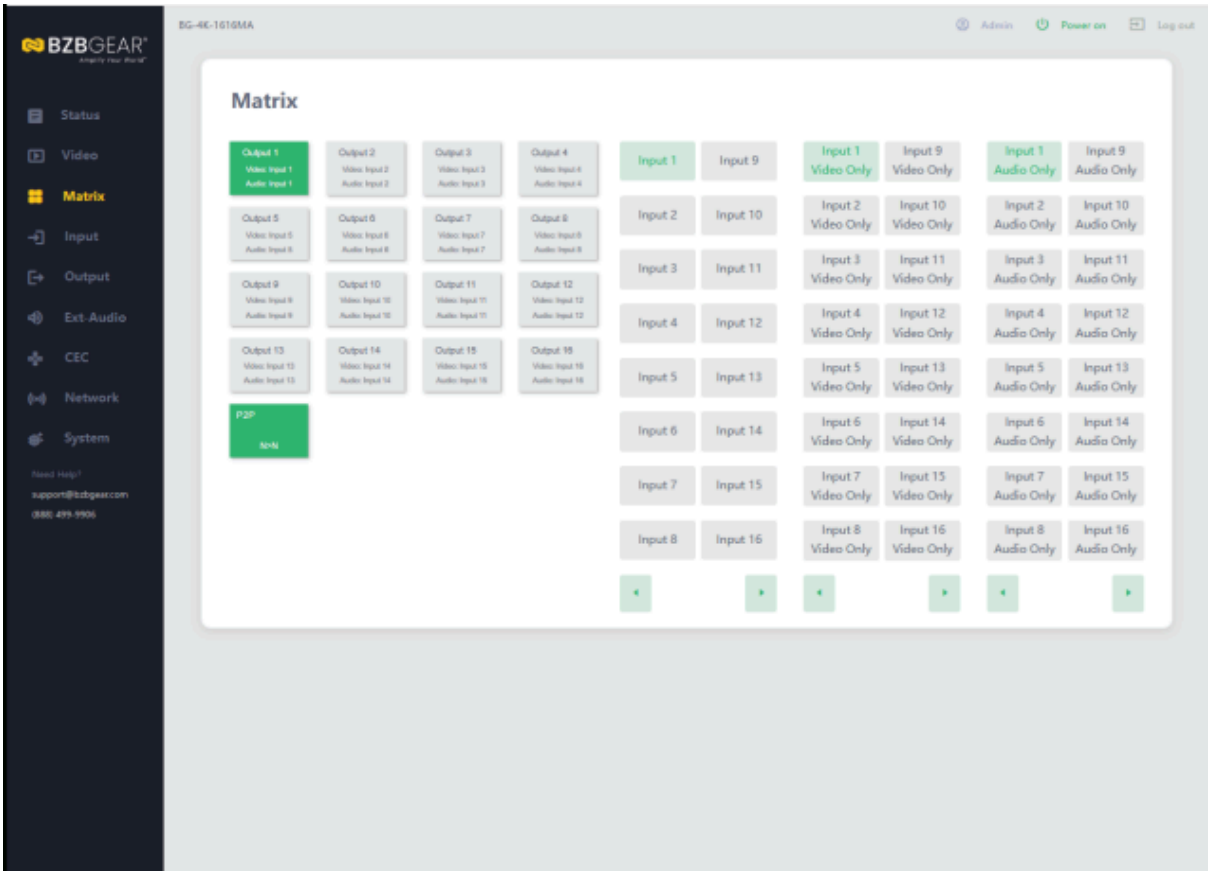
① **Switch:** Select the input signal source for the corresponding output port. Video and audio from the input channel can be assigned independently.

② **Presets:** Create, save, recall, or clear presets. Each preset stores the routing configuration between outputs and inputs on the Video page. Up to **16 presets** can be saved.

For example, **Preset 1** stores the routing configuration for **Output 1** and its assigned input channel. Click **Save** or **Clear** to manage the preset, and click **Recall** to apply it when needed.

The preset name can be customized.

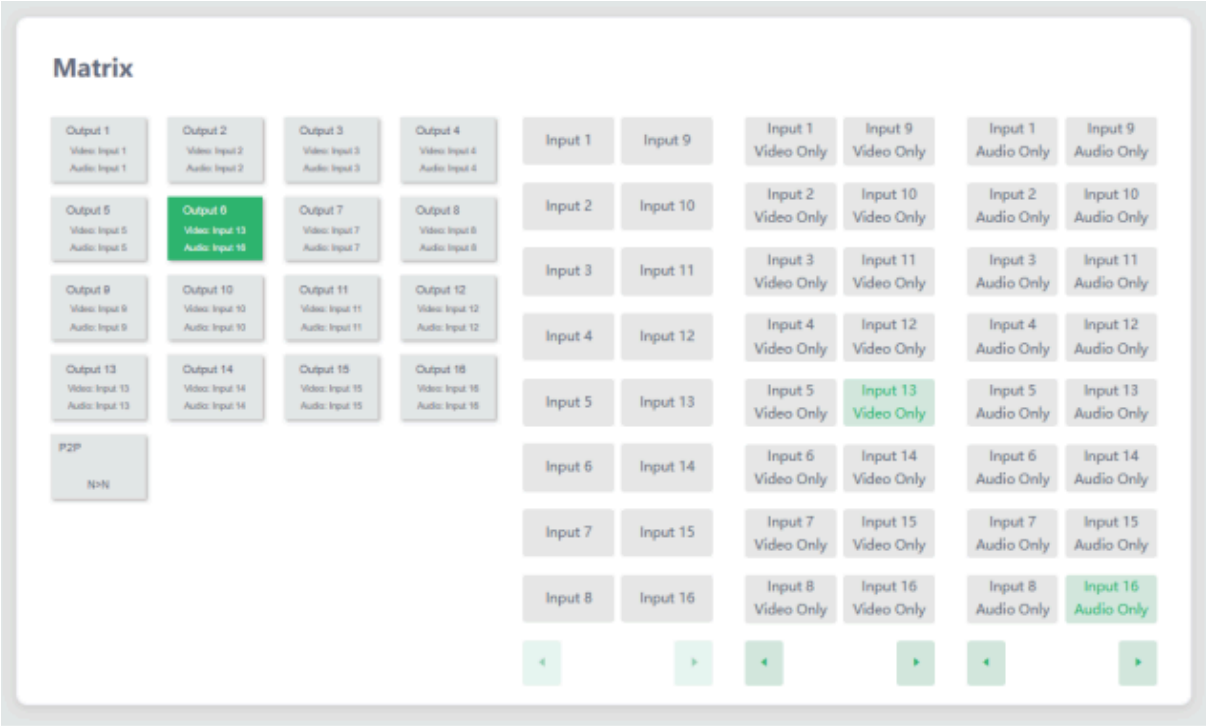
Matrix Page



On the **Matrix** page, first select an output (1–16), then choose an input source (1–16). The available input sources will appear below the selected output area.

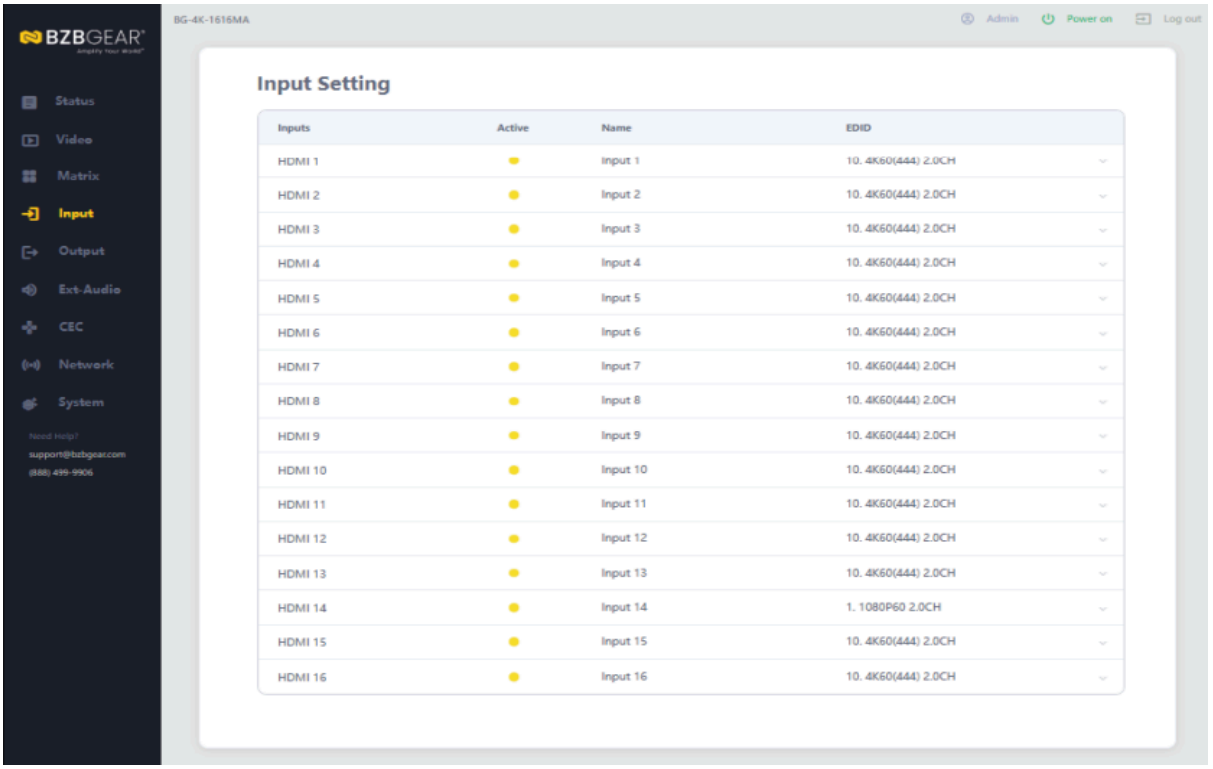
The display names of each input and output can be customized on the **Input** and **Output** pages.

Note: Video and audio signals from each input channel can be routed independently. For example, you can assign the video from **Input 3** and the audio from **Input 4** to **Output 2**.



Note: If you click P2P button, the output and input channels will be restored to one-to-one correspondence, that is, Output1 matches Input1, Output2 matches Input2…

Input Page



You can perform the following operations on the **Input** page:

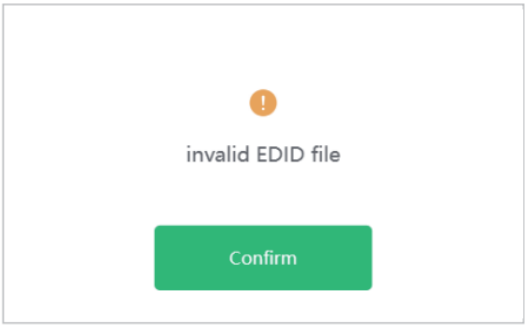
① **Input:** Displays the device's input channel.

② **Active:** Indicates whether the input channel is connected to a signal source. The indicator is **green** when connected and **yellow** when not connected.

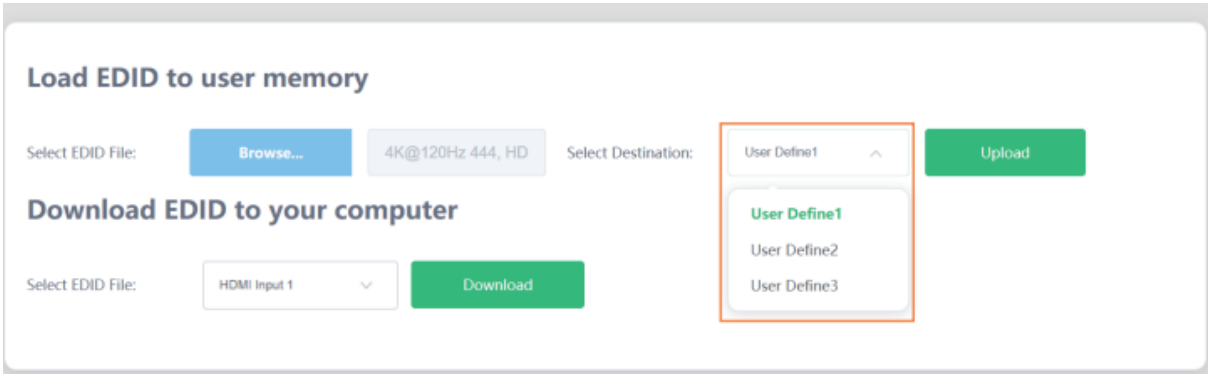
③ **Name:** Displays the input channel name. You can modify it by entering a custom name in the input field (maximum length: **32 characters**).

④ **EDID:** Displays the current EDID assigned to the input. Click the drop-down menu to select a different EDID.

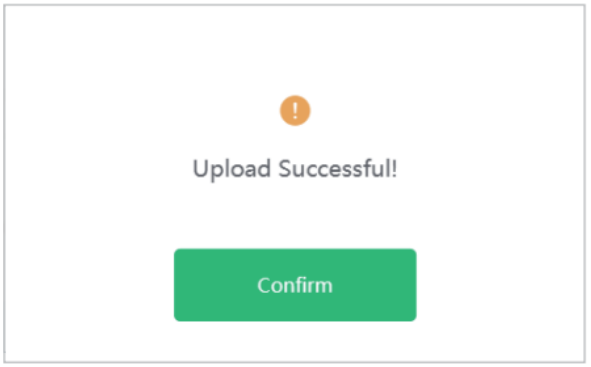
⑤ **Load EDID to User Memory:** Allows you to upload a custom EDID. Click **"Browse"**, then select the desired **.bin** file. If an invalid EDID file is selected, a prompt will appear, as shown in the figure below.



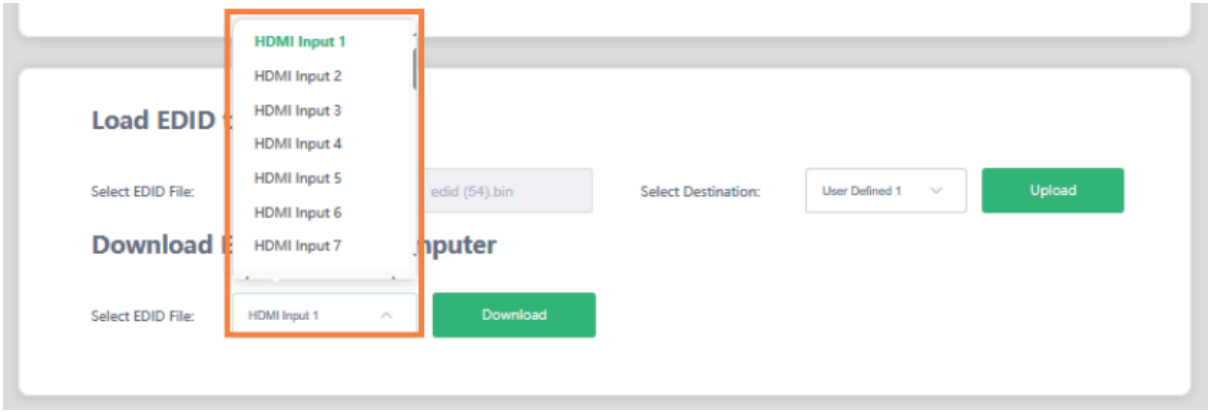
Make sure to select the correct file, and check the name of the selected file. Then select destination “User Define1/User Define2/User Define3”, and click “Upload”.



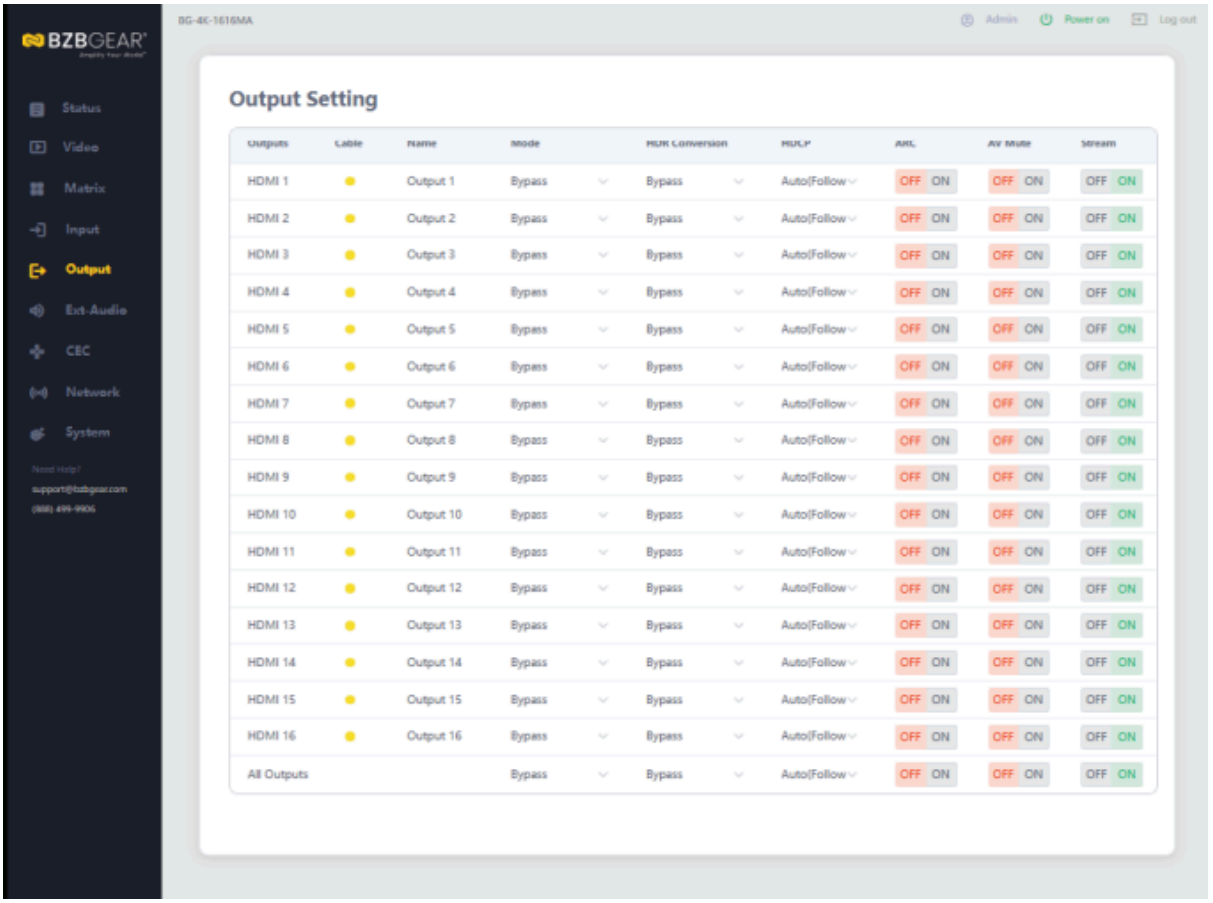
After successful setting, it will prompt as follows:



⑥ Download EDID to your computer: If you want to download the existing EDID, click the drop-down box of “Select EDID File” to select the input channel you want, and then click “Download” to save the corresponding EDID file to your computer.



Output Page



You can perform the following operations on the **Output** page:

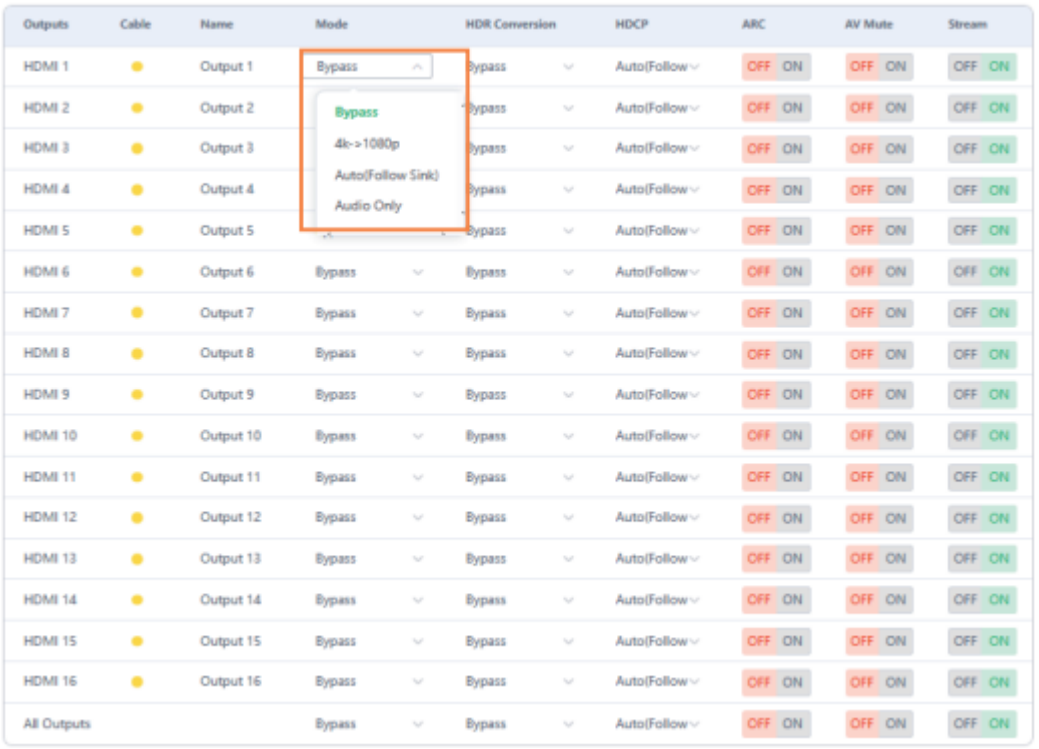
① **Outputs:** Displays the device's output channels.

- **All Output:** Selecting a value from the drop-down menu applies it to all output channels simultaneously.

② **Cable:** Indicates the connection status of each output port. The indicator is **green** when connected to a display and **yellow** when not connected.

③ **Name:** Displays the output channel name. You can modify it by entering a custom name in the input field (maximum length: **32 characters**).

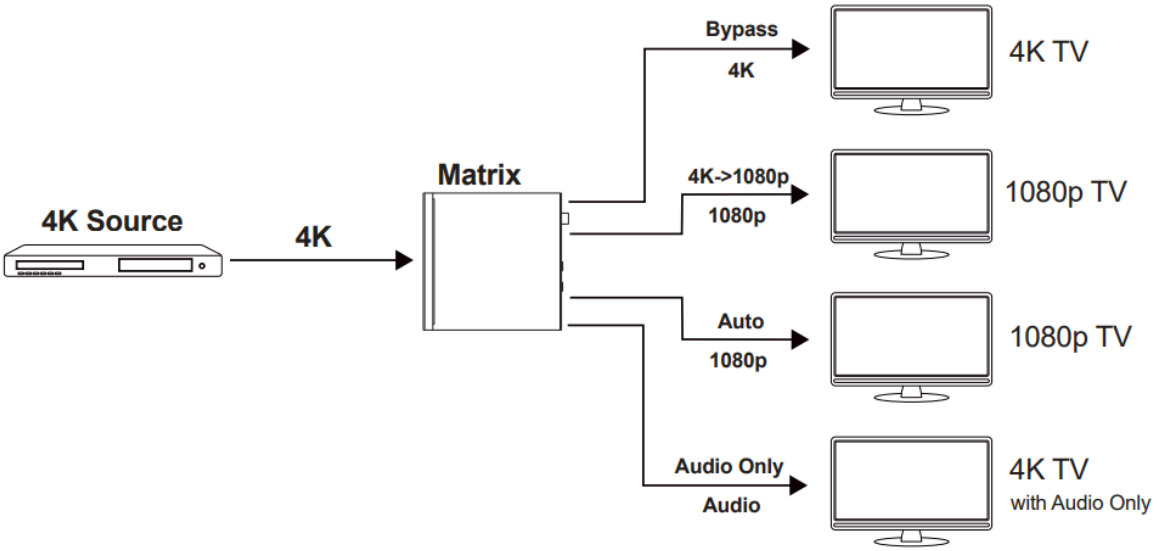
④ **Mode:** Supports video downscaling for all outputs. The device will output the appropriate video resolution according to the selected mode. Click the drop-down menu to choose the desired video mode.



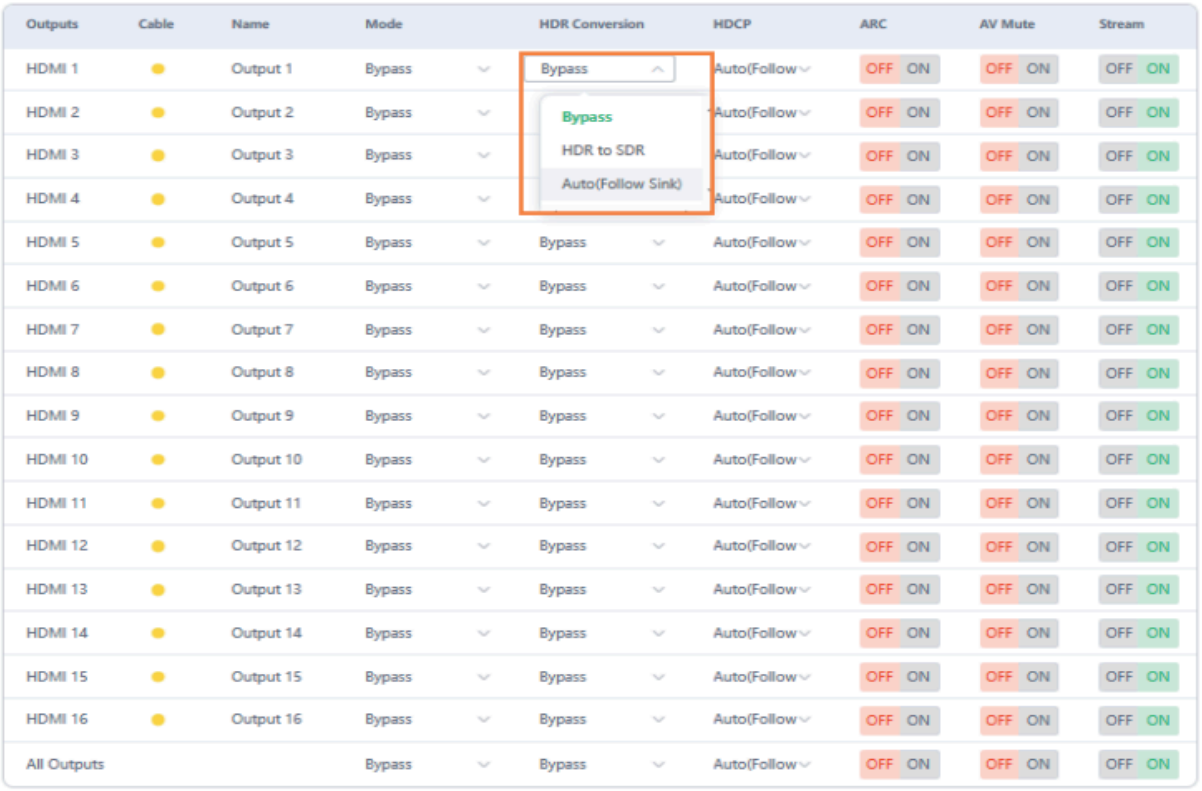
There are four available options:

- **Bypass (Default):** The output resolution follows the input source.
- **4K → 1080p:** Downscales any 4K signal to 1080p.
- **Auto (Follow Sink):** The output resolution follows the EDID of the connected display device.
- **Audio Only:** Outputs only audio, with no video signal.

Example of video modes shown below:



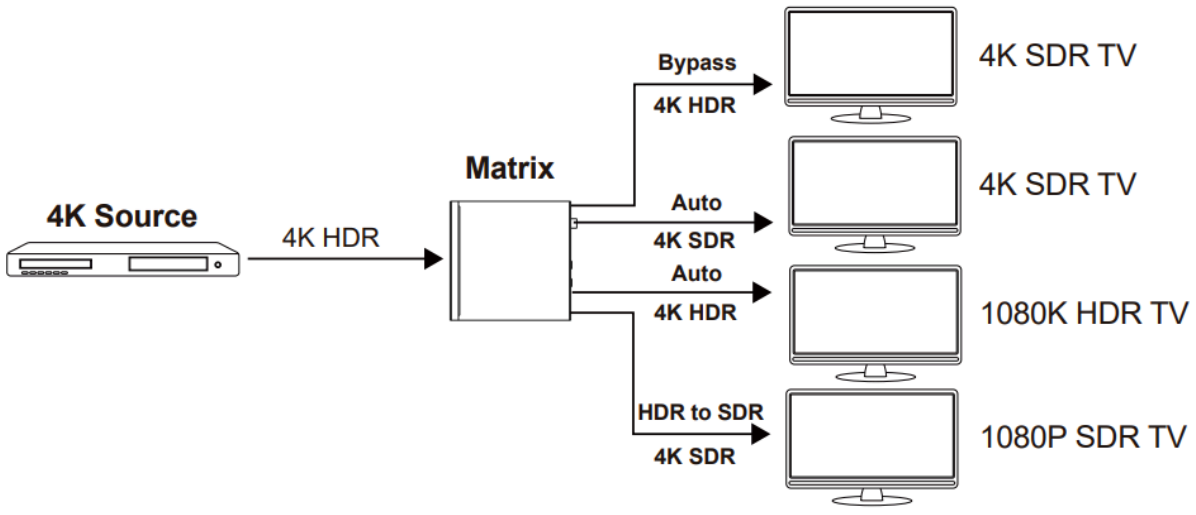
⑤ **HDR Conversion:** This product supports HDR-to-SDR conversion on all outputs. It automatically outputs the appropriate HDMI signal based on the EDID of the connected display. Click the drop-down menu to select the desired HDR conversion mode.



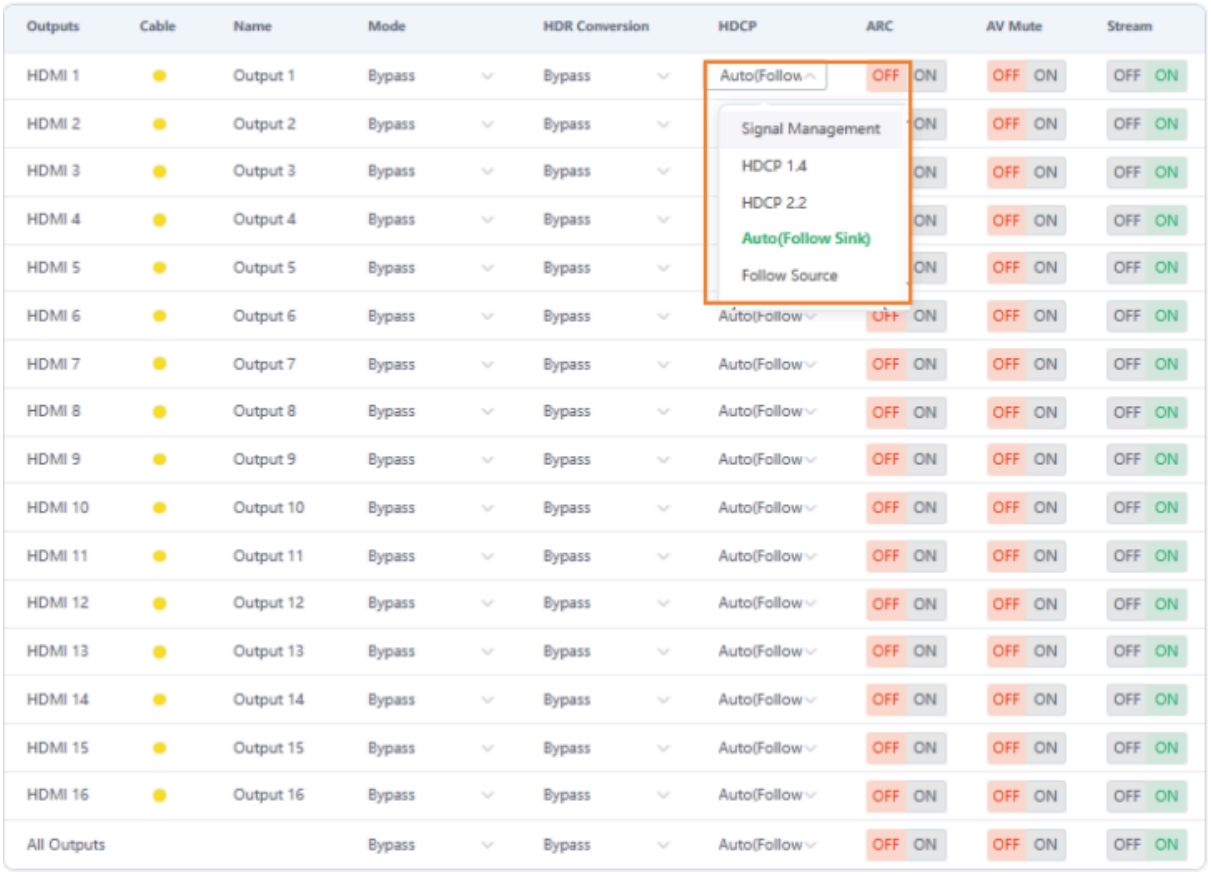
There are three available options:

- **Bypass:** The output format follows the input source.
- **HDR to SDR:** Converts HDR HDMI signals to SDR to meet the requirements of the connected display.
- **Auto (Follow Sink):** The output format follows the EDID of the connected display device.

Example of HDR conversion shown below:



⑥ **HDCP:** Click the drop-down menu and set the HDCP for the current device output.



There are five available options:

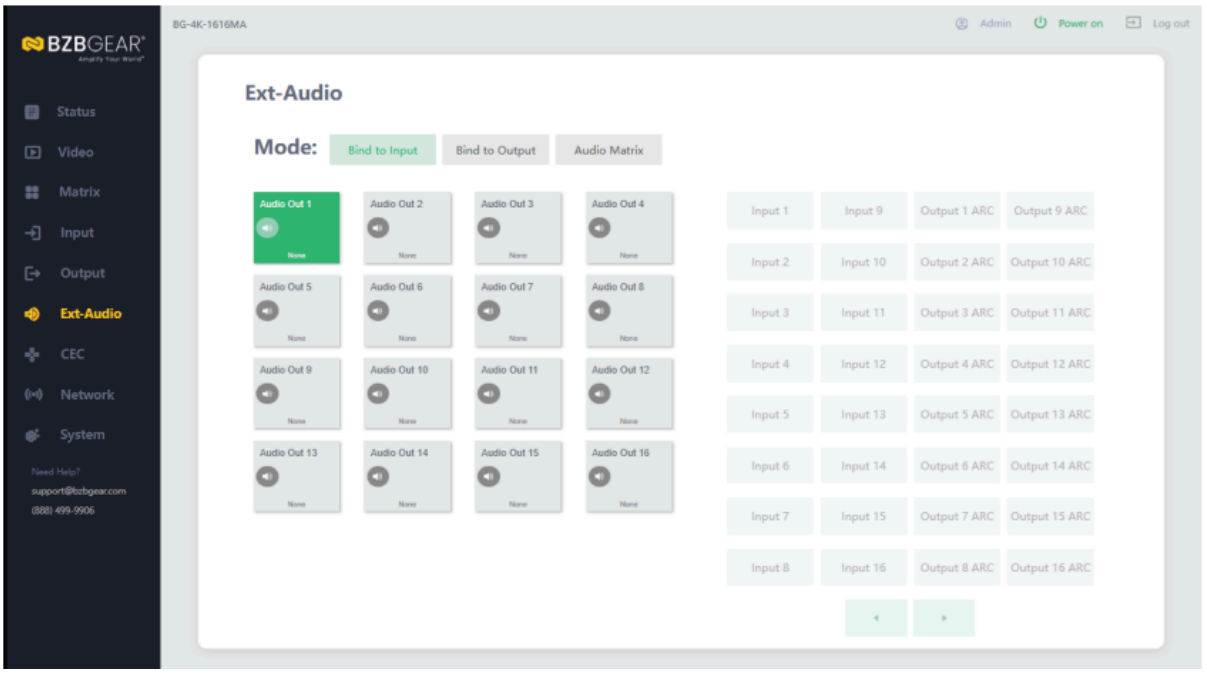
- **Signal Management:** Reserved for future use.
- **HDCP 1.4:** Forces HDCP 1.4 compliance.
- **HDCP 2.2:** Forces HDCP 2.2 compliance.
- **Auto (Follow Sink):** The HDCP version follows the requirements of the connected display device.
- **Follow Source:** The HDCP version follows the assigned input source.

⑦ **ARC:** Click the **ON/OFF** button to enable or disable the ARC function.

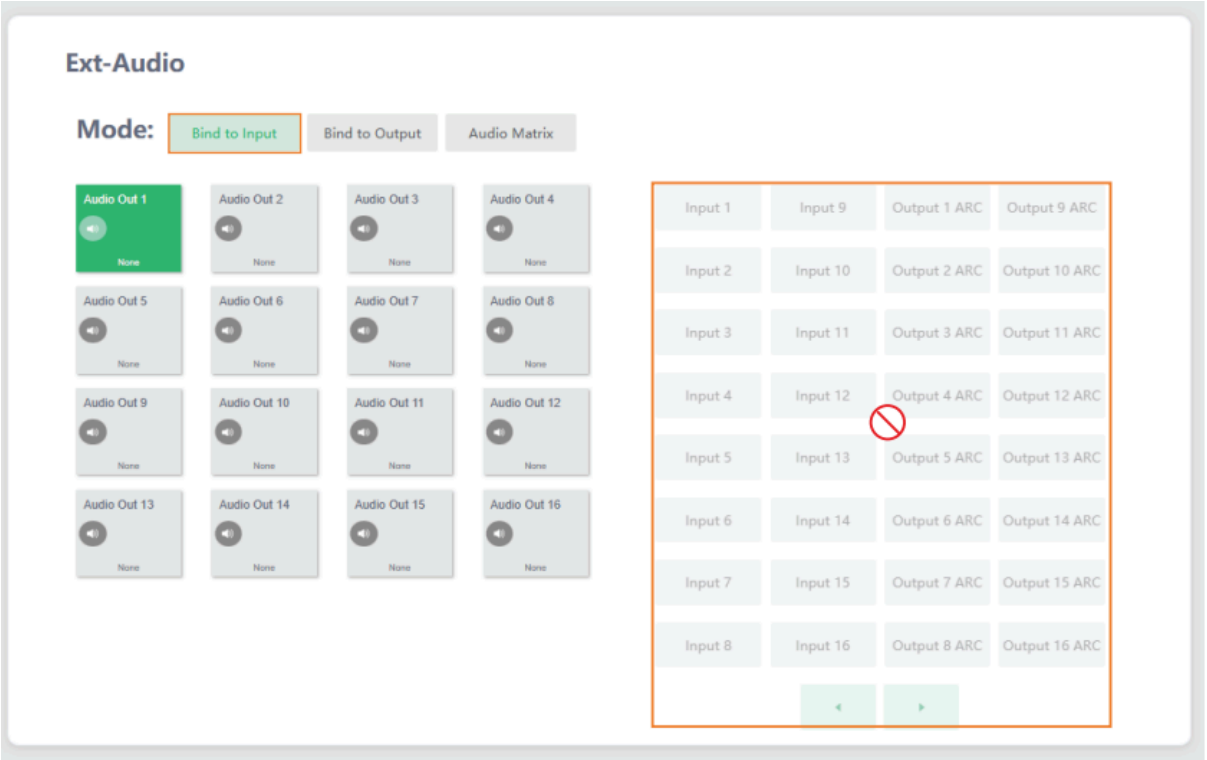
⑧ **Stream:** Click the **ON/OFF** button to enable or disable the output stream.

EXT-Audio Page

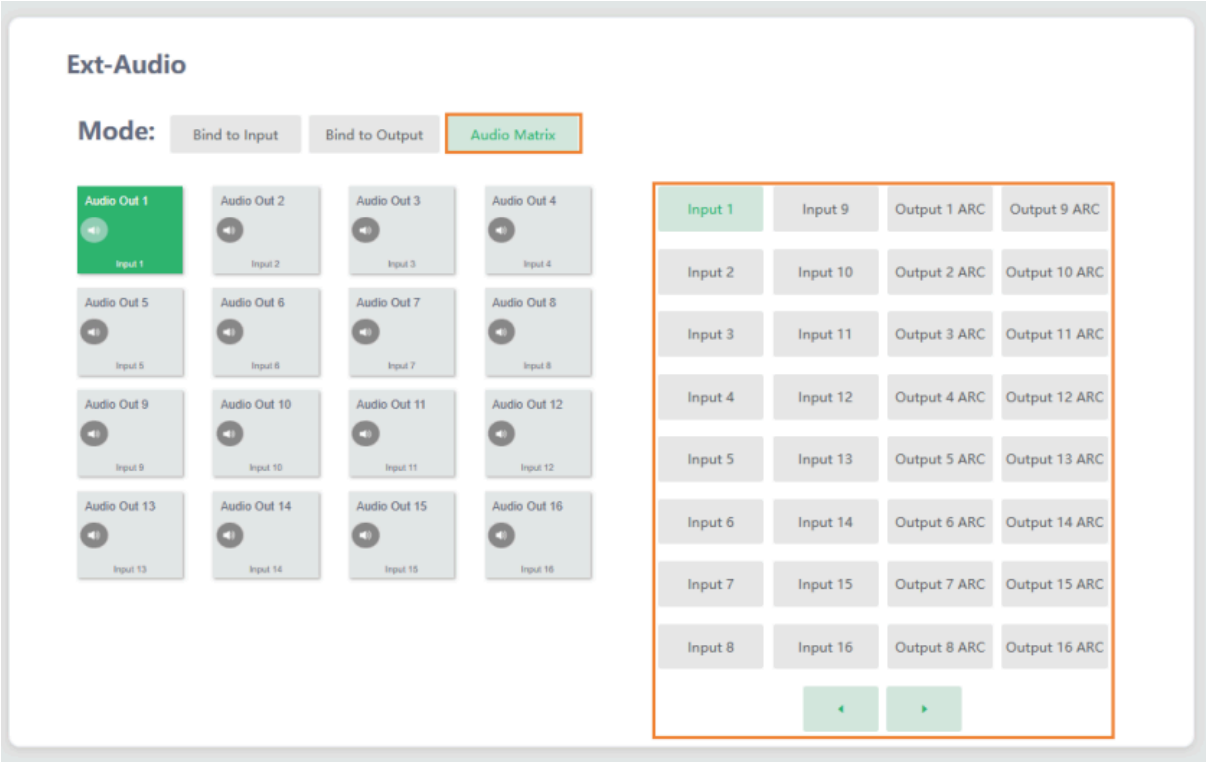
You can set the audio mode on the Ext-Audio page. There are three modes: Bind to Input, Bind to Output and Audio Matrix. In each mode, you can adjust the volume of the channel or mute it.



Bind to Input: The audio output follows the input signal. And there is a consistent one-to-one match between each HDMI input and audio output. In this mode, the input sources and output ARC can't be selected.

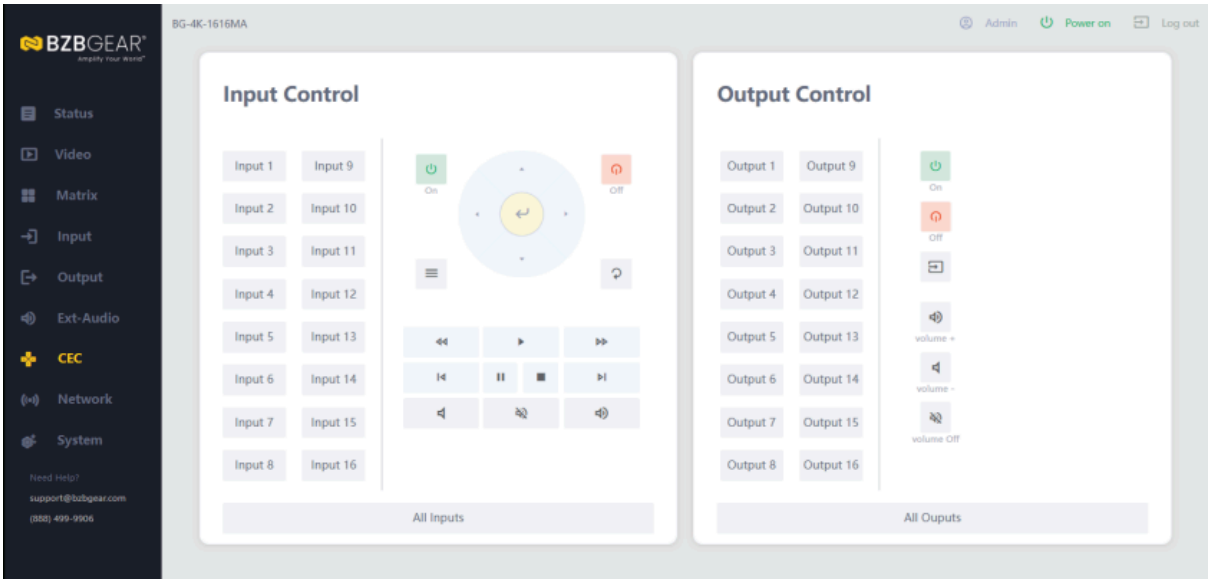


Bind to Output: The audio output follows the HDMI output. The HDMI input sources are assigned to the HDMI outputs, and then transmitted to the audio outputs from the HDMI outputs. The input sources could be the same or different. In this mode, the input sources and output ARC can't be selected.



Audio Matrix: This mode allows you to matrix the extracted audio independently. Click on an Audio Out, and then select any input source or ARC audio on the right, which will appear below the selected audio out. One route of audio configuration is completed.

CEC Page

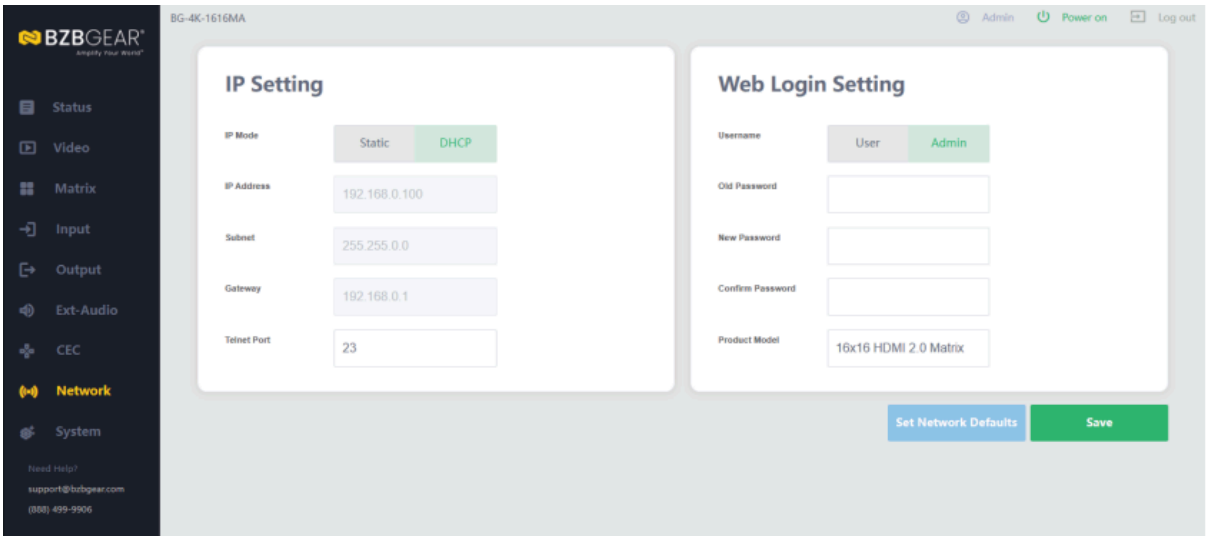


You can manage **CEC** functions on this page. Inputs and outputs can be controlled by clicking the corresponding icons.

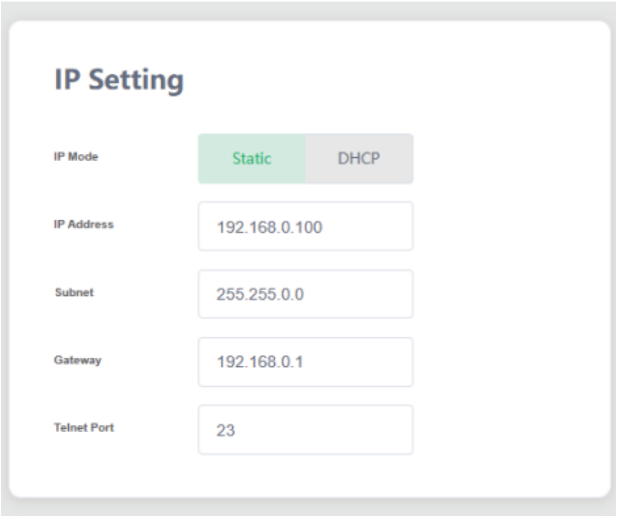
① **Input Control:** Select an input source from the left panel, then use the icons to control functions such as **power on/off, return, source switching, play/pause, fast forward, rewind, mute, and unmute**.

② **Output Control:** Select an output from the left panel, then use the icons to control the connected display, including **power on/off, volume up/down/mute, and active source switching**.

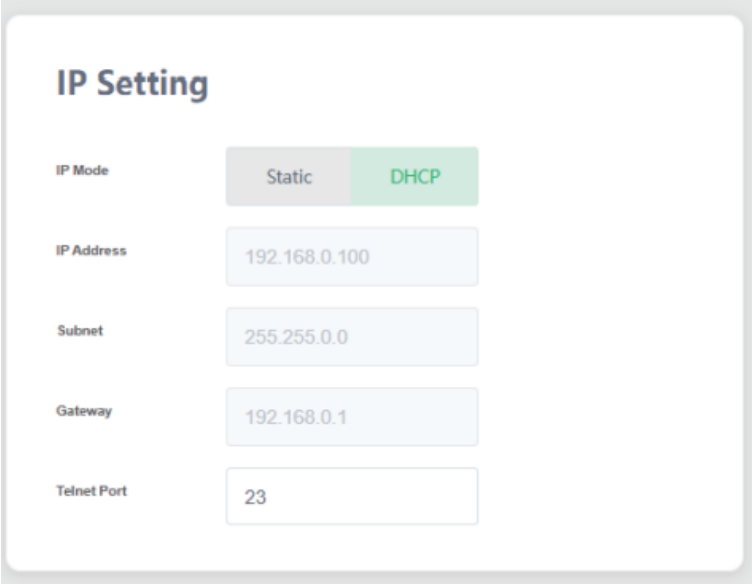
Network Page



① **Modify Network Settings:** Configure the **IP mode, IP address, gateway, subnet mask,** and **Telnet port** as needed. Click **"Save"** to apply and activate the changes.



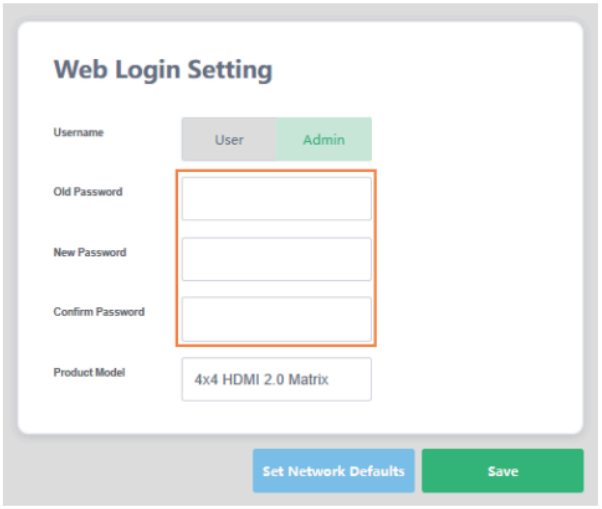
If the Mode is "Static", you can manually set the IP Address/Gateway/ Subnet/Telnet Port as required.

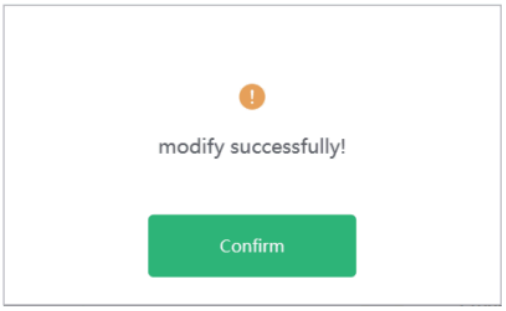


If the Mode is set to "DHCP", it will search and be filled with the IP Address assigned by the router automatically. You cannot manually modify a DHCP-assigned IP address.

② **Modify User Password:**

Click the **"User"** button, then enter the correct **Old Password**, **New Password**, and **Confirm Password**. Click **"Save"** to apply the changes. After the password is successfully updated, a confirmation prompt will appear, as shown in the figure below.



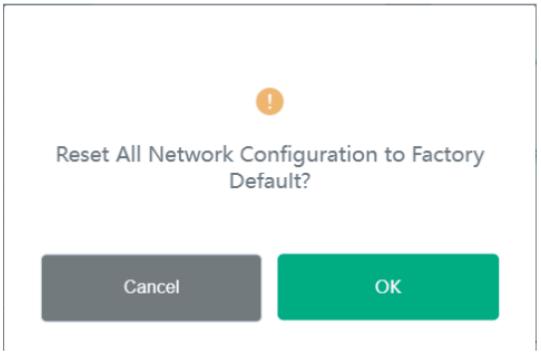


Note: Password Change Rules:

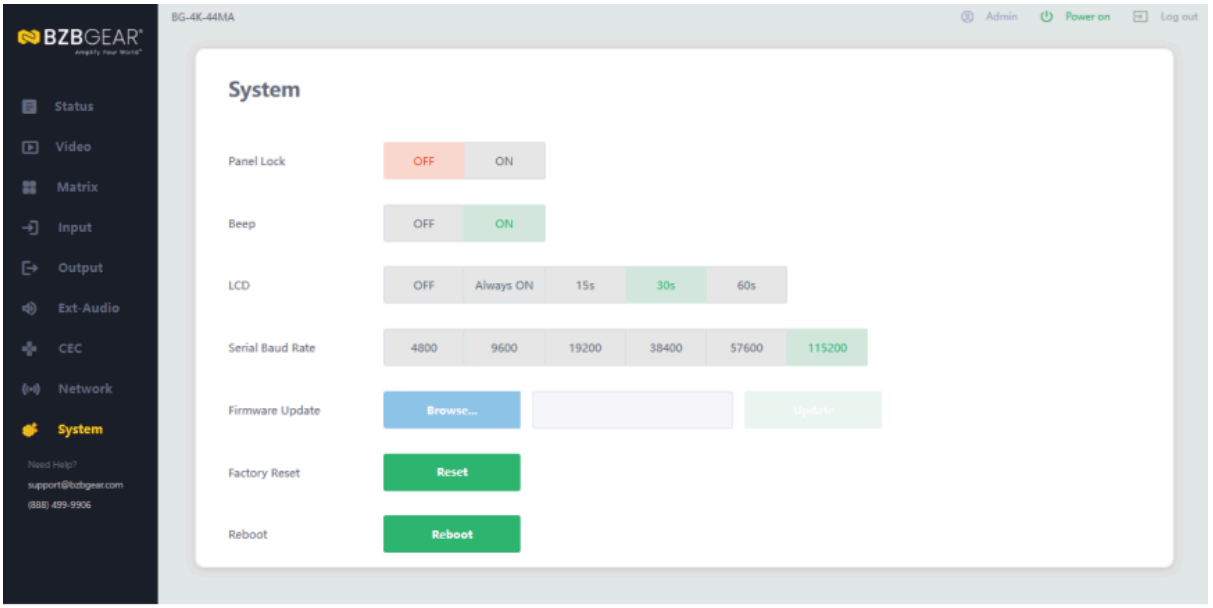
1. The password cannot be empty.
2. The new password must be different from the old password.
3. The new password and confirm password must match.

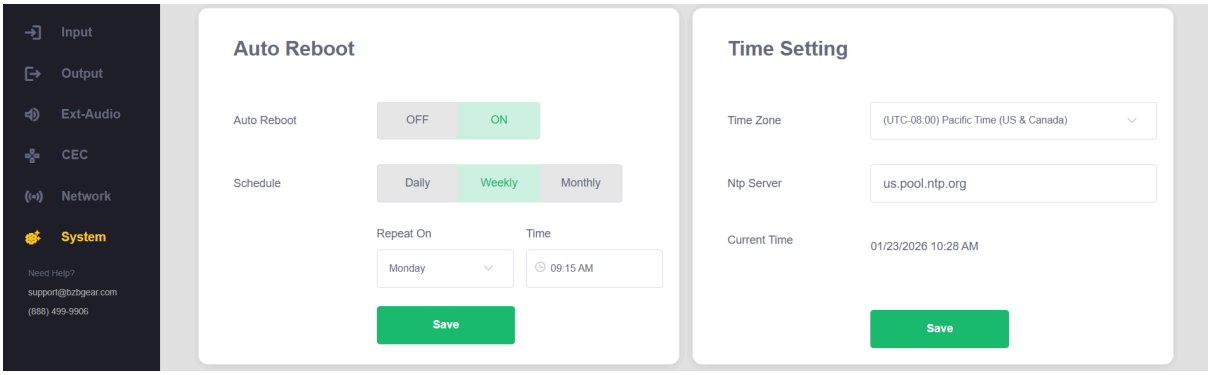
③ **Set Default Network:**

Click **"Set Network Defaults"**. A confirmation prompt will appear, as shown in the figure below.



System Page





You can perform the following operations on the **System** page:

① **Panel Lock:** Click **ON/OFF** to lock or unlock the front-panel buttons.

- **ON:** Panel buttons are disabled.
- **OFF:** Panel buttons are enabled.

② **Beep:** Enable or disable the system beep.

③ **LCD:** Turn the LCD display on or off and set the display timeout (**Always On / 15 s / 30 s / 60 s**).

④ **Serial Baud Rate:** Click the value to configure the serial communication baud rate.

⑤ **Firmware Update:** Click **"Browse"** to select the firmware file, then click **"Update"** to complete the firmware upgrade.

⑥ **Factory Reset:** Click **"Reset"** to restore the unit to factory default settings.

⑦ **Reboot:** Click **"Reboot"** to restart the unit.

Note: After a reset or reboot, the system will return to the login page.

Auto Reboot: The Auto Reboot function allows the BG-4K-44MA to restart automatically on a scheduled basis. Enable or disable the feature, then select a Daily, Weekly, or Monthly reboot schedule. When set to Weekly or Monthly, choose the desired day and time. This feature helps maintain stable operation and is recommended for long-term or continuous-use installations.

RS-232 Command

The BG-4K-1616MA supports **RS-232 control**. Connect the Matrix RS-232 control port to a PC using an RS-232 serial cable. Then, open a serial command tool on the PC and send **ASCII commands** to control the Matrix.

The ASCII command list for this product is shown below:

RS-232 Command Table

ASCII Command
Serial port protocol: Baud rate: 115200, Data bits: 8, Stop bits: 1, Check bit: 0
TCP/IP protocol: Port 8000 **Telnet port:** 23
Parameters: x, y, z, XXX are parameters
Error Codes:

- E00 → Unknown command
- E01 → Parameter out of range
- E02 → Get error EDID data

Command Code	Function	Description	Example	Feedback/Default
System Setting				
help!	List all commands	Lists all available commands	help!	Please refer to the note at the end of the list.
status!	Get device current status	Retrieve current device status	status!	

r type!	Get device model	Returns device model info	r type!	16x16 HDMI 2.0 Matrix
r fw version!	Get Firmware version	Retrieve firmware version	r fw version!	BOOT: V1.00.01 MCU: V1.00.01 WEB: V1.00.01 SUB1: V1.00.01 SUB2: V1.00.01 SUB3: V1.00.01 SUB4: V1.00.01 SUB5: V1.00.01 FPGA: V1.00.01
power z!	Power on/off the device	z=0: power off, z=1: power on	power 1!	Power: on System initializing... Initialization finished!
r power!	Get current power state	Returns device power status	r power!	Power: on
s beep z!	Enable/Disable buzzer	z=0: beep off, z=1: beep on	s beep 1!	Beep: on / beep off
r beep!	Get buzzer state	Returns buzzer state	r beep!	Beep: on
s lock z!	Lock/Unlock front panel button	z=0: unlock, z=1: lock	s lock 1!	Button lock: on / Lock off
r lock!	Get panel button lock state	Returns lock status	r lock!	Button lock: on
s ir z!	Set IR on/off	z=0: IR off, z=1: IR on	s ir 1!	IR: on / IR off
r ir!	Get IR state	Returns IR status	r ir!	IR: on
s lcd on time z!	Set LCD remain on time	z=0~4 (0:Off, 1:Always, 2:15s, 3:30s, 4:60s)	s lcd on time 3!	Lcd remain time: 30s
r lcd mode!	Get LCD backlight status	Returns LCD screen backlight status	r lcd mode!	Lcd remain time: 30s

s baud x!	Set RS-232 baud rate	x=1~6 (1:4800, 2:9600, 3:19200, 4:38400, 5:57600, 6:115200)	s baud 6!	Baud rate: 115200
r baud!	Get RS-232 baud rate	Returns baud rate	r baud!	Baud rate: 115200
reboot!	Reboot device	Reboots the device	reboot!	Reboot… System initializing... Initialization finished!
reset!	Reset to factory defaults	Resets device	reset!	Reset to factory defaults System initializing... Initialization finished!
r link in x!	Get input port status	x=0~16, 0=All	r link in 1!	HDMI input 1: connect/sync/disconnect
r link out y!	Get output port status	y=0~16, 0=All	r link out 1!	HDMI output 1: connect/disconnect
s save preset z!	Save switch state to preset z	z=1~16	s save preset 1!	Preset 1: save
s recall preset z!	Recall preset z	z=1~16	s recall preset 1!	Preset 1: recall
s clear preset z!	Clear preset z	z=1~16	s clear preset 1!	Preset 1: clear
r preset z!	Get preset info	z=1~16	r preset 1!	Video/audio crosspoint
s fan x speed y!	Set fan x speed	x=0~4 (0=All), y=0~4 (0=Auto,1=25%,2=50%,3=75%,4=100%)	s fan 0 speed 0!	Fan 1 speed: auto Fan 2 speed: auto Fan 3 speed: auto Fan 4 speed: auto
r fan x speed!	Get fan speed	x=0~4, 0=All	r fan 0 speed!	Fan 1 speed: auto Fan 2 speed: auto Fan 3 speed: auto Fan 4 speed: auto
r temp!	Get internal temperature	Device temperature	r temp!	65C

r uptime!	Get running time	Format: Day:Hour:Min:Sec	r uptime!	000:00:13:04
Output Setting				
s output y in source x!	Route input x to output y	y=0~16, x=1~16	s output 1 in source 1!	Output 1: input 1
r output y in source!	Get output y input source	y=0~16	r output 1 in source!	Output 1: input 1
s output y in audio x!	Route audio x to output y	y=0~16, x=0~16	s output 0 in audio 2!	Output 1 audio: input 2 ... Output 16 audio: input 2
r output y in audio!	Get output y audio source	y=0~16	r output 0 in source!	Output 1 audio: input 2 ... Output 16 audio: input 2
s output y hdcp x!	Set output HDCP	y=0~16, x=0~4	s output 1 hdcp 2!	Output 1 HDCP: HDCP 2.2 Follow sink
r output y hdcp!	Get output HDCP status	y=0~16	r output 1 hdcp!	Output 1 HDCP: HDCP 2.2
s output y stream x!	Enable/Disable output stream	y=0~16, x=0~1	s output 1 stream 1!	Output 1 stream: enable
r output y stream!	Get output stream status	y=0~16	r output 1 stream!	Output 1 stream: enable
s output y video mode x!	Set video mode	y=0~16, x=1~4	s output 1 video mode 2!	Output 1 video mode: 4K to 1080P Bypass
r output y video mode!	Get video mode	y=0~16	r output 1 video mode!	Output 1 video mode: 4K to 1080P
s output y avmute x!	Set AV mute	y=0~16, x=0~1	s output 1 avmute 1!	Output 1 avmute: on/off

r output y avmute!	Get AV mute status	y=0~16	r output 1 avmute!	Output 1 avmute: on
s output y hdr x!	Set HDR to SDR mode	y=0~16, x=1~3	s output 1 hdr 2!	Output 1 HDR mode: HDR to SDR Bypass
r output y hdr!	Get HDR status	y=0~16	r output 1 hdr!	Output 1 HDR mode: HDR to SDR
EDID Setting				
s output y arc x!	Set ARC on/off	y=0~16, x=0~1	s output 1 arc 0!	Output 1 arc: off
r output y arc!	Get ARC status	y=0~16	r output 1 arc!	Output 1 arc: off
s input x EDID z!	Set HDMI input EDID	x=0~16, z=1~40	s input 1 EDID 10!	Input 1 EDID: 4K60(444) 2.0CH
r input x EDID!	Get input EDID	x=0~16	r input 1 EDID!	Input 1 EDID: 4K60(444) 2.0CH
s user x edid 00 FF FF …!	Set user EDID	x=1~3	s user 1 edid 00 FF FF FF FF …!	User 1 EDID data: 00 FF FF …
r user x edid!	Get user EDID	x=1~3	r user 1 edid!	User 1 EDID data: 00 FF FF …
Ext-audio Setting				
s output exa mode x!	Set ext-audio mode	x=0~2	s output exa mode 0!	Ext-audio mode: follow input
r output exa mode!	Get ext-audio mode		r output exa mode!	Ext-audio mode: follow input

s output y exa in source x!	Route audio to ext-audio	y=0~16, x=1~32	s output 1 exa in source 1!	Ext-audio 1: input 1 … Ext-audio 16: input 16
r output y exa in source!	Get ext-audio input source	y=0~16	r output 0 exa in source!	Ext-audio 1: input 1 … Ext-audio 16: input 16
s output y exa mute x!	Mute ext-audio	y=0~16, x=0~1	s output 0 exa mute 1!	Ext-audio 1 mute: on … Ext-audio 16 mute: on
r output y exa mute!	Get mute state	y=0~16	r output 1 exa mute!	Ext-audio 1 mute: on

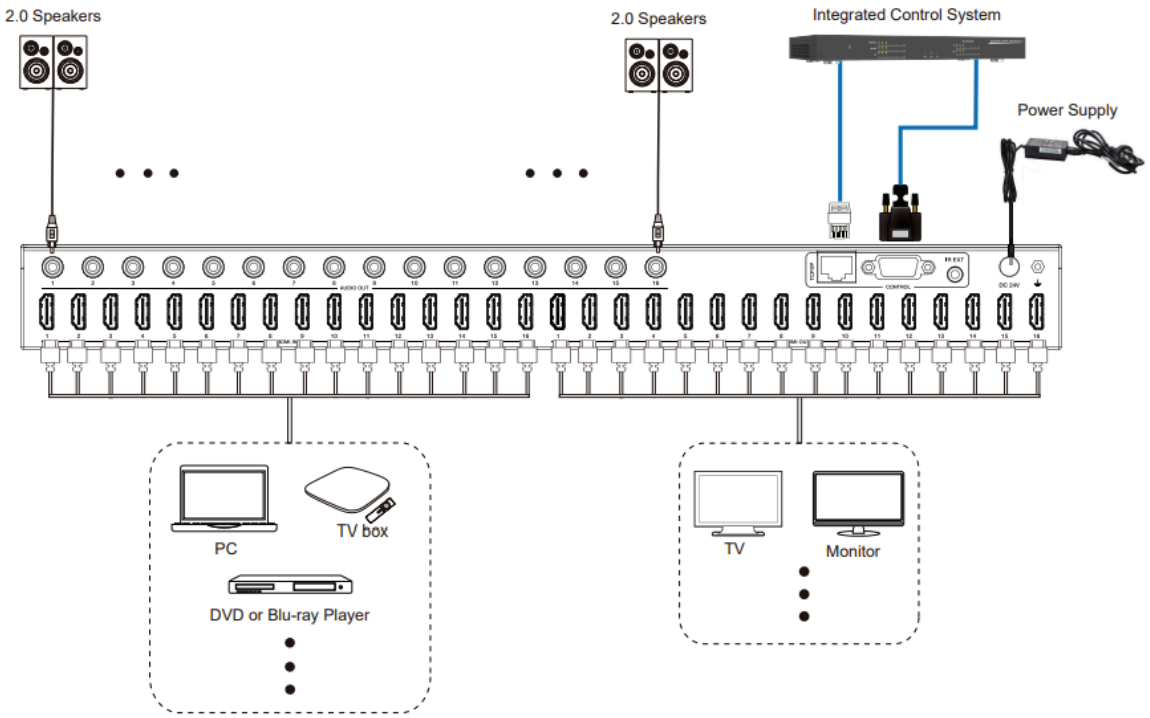
Command Code	Function	Description	Example	Feedback/Default
CEC Setting				
s cec in x on!	Set input x power on by CEC	x=0~16 (0=all input)	s cec in 1 on!	HDMI input 1 CEC: power on
s cec in x off!	Set input x power off by CEC	x=0~16	s cec in 1 off!	HDMI input 1 CEC: power off
s cec in x menu!	Open input x menu via CEC	x=0~16	s cec in 1 menu!	HDMI input 1 CEC: open menu
s cec in x back!	Back operation via CEC	x=0~16	s cec in 1 back!	HDMI input 1 CEC: back operation
s cec in x up!	Menu up via CEC	x=0~16	s cec in 1 up!	HDMI input 1 CEC: menu up operation
s cec in x down!	Menu down via CEC	x=0~16	s cec in 1 down!	HDMI input 1 CEC: menu down operation
s cec in x left!	Menu left via CEC	x=0~16	s cec in 1 left!	HDMI input 1 CEC: menu left operation
s cec in x right!	Menu right via CEC	x=0~16	s cec in 1 right!	HDMI input 1 CEC: menu right operation
s cec in x enter!	Menu enter via CEC	x=0~16	s cec in 1 enter!	HDMI input 1 CEC: menu enter operation

s cec in x play!	Play operation via CEC	x=0~16	s cec in 1 play!	HDMI input 1 CEC: play operation
s cec in x pause!	Pause operation via CEC	x=0~16	s cec in 1 pause!	HDMI input 1 CEC: pause operation
s cec in x stop!	Stop operation via CEC	x=0~16	s cec in 1 stop!	HDMI input 1 CEC: stop operation
s cec in x rew!	Rewind operation via CEC	x=0~16	s cec in 1 rew!	HDMI input 1 CEC: rewind operation
s cec in x mute!	Volume mute via CEC	x=0~16	s cec in 1 mute!	HDMI input 1 CEC: volume mute
s cec in x vol-!	Volume down via CEC	x=0~16	s cec in 1 vol-!	HDMI input 1 CEC: volume down
s cec in x vol+!	Volume up via CEC	x=0~16	s cec in 1 vol+!	HDMI input 1 CEC: volume up
s cec in x ff!	Fast forward via CEC	x=0~16	s cec in 1 ff!	HDMI input 1 CEC: fast forward operation
s cec in x previous!	Previous operation via CEC	x=0~16	s cec in 1 previous!	HDMI input 1 CEC: previous operation
s cec in x next!	Next operation via CEC	x=0~16	s cec in 1 next!	HDMI input 1 CEC: next operation
s cec hdmi out y on!	HDMI output power on via CEC	y=0~16	s cec hdmi out 1 on!	HDMI output 1 CEC: power on
s cec hdmi out y off!	HDMI output power off via CEC	y=0~16	s cec hdmi out 1 off!	HDMI output 1 CEC: power off
s cec hdmi out y mute!	HDMI output volume mute via CEC	y=0~16	s cec hdmi out 1 mute!	HDMI output 1 CEC: volume mute
s cec hdmi out y vol-!	HDMI output volume down via CEC	y=0~16	s cec hdmi out 1 vol-!	HDMI output 1 CEC: volume down

s cec hdmi out y vol+!	HDMI output volume up via CEC	y=0~16	s cec hdmi out 1 vol+!	HDMI output 1 CEC: volume up
s cec hdmi out y active!	HDMI output active source via CEC	y=0~16	s cec hdmi out 1 active!	HDMI output 1 CEC: active source
Network Setting				
r ipconfig!	Get current IP configuration	Displays DHCP/Static info	r ipconfig!	IP mode: DHCP IP address: 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	Returns MAC	r mac addr!	Mac address: 00:1C:91:03:80:01
s ip mode z!	Set network IP mode	z=0: Static, z=1: DHCP	s ip mode 0!	Set IP mode: Static (requires s net reboot!)
r ip mode!	Get network IP mode		r ip mode!	IP mode: Static
s ip addr xxx.xxx.xxx.xxx!	Set IP address	Requires s net reboot!	s ip addr 192.168.0.100!	Set IP address: 192.168.0.100
r ip addr!	Get IP address		r ip addr!	IP address: 192.168.0.100
s subnet xxx.xxx.xxx.xxx!	Set subnet mask	Requires s net reboot!	s subnet 255.255.255.0!	Set subnet Mask: 255.255.255.0
r subnet!	Get subnet mask		r subnet!	Subnet Mask: 255.255.255.0
s gateway xxx.xxx.xxx.xxx!	Set network gateway	Requires s net reboot!	s gateway 192.168.0.1!	Set gateway: 192.168.0.1
r gateway!	Get network gateway		r gateway!	Gateway: 192.168.0.1
s tcp/ip port x!	Set network TCP/IP port	x=1~65535	s 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
r telnet port!	Get network telnet port		r telnet port!	Telnet port: 23
s net reboot!	Reboot network modules	Applies network changes	s network reboot!	Network reboot… IP mode: DHCP IP address: 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

Connection Diagram



BZBGEAR Switch Control App

BG-Switch-Control | Quick User Guide

BZBGEAR Switch Control App

Overview

The **BZBGEAR Switch Control App (BG-Switch-Control)** is a multi-platform network control application for compatible BZBGEAR matrix switchers. It provides centralized control of **video routing, audio routing, presets, and video wall configurations** through an intuitive graphical interface.

Platform Compatibility

Supported operating systems:

- **Windows**
- **macOS**
- **iOS**
- **Android**

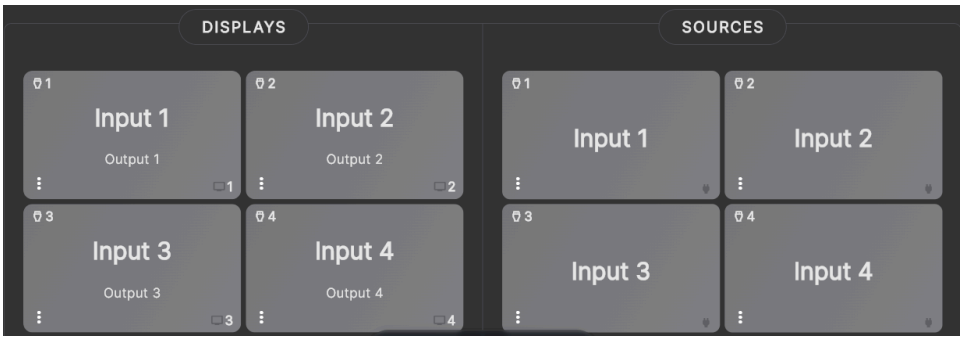
- All control devices must be connected to the **same local network** as the matrix switcher.

Connection & Startup

1. Connect the BZBGEAR matrix switcher to the local network.
2. Connect the control device (PC, tablet, or smartphone) to the same network.
3. Launch the **BG-Switch-Control App**.

4. Select the correct product from the (Add Device) drop-down list
5. Fill in the device information (IP address, name, etc.)

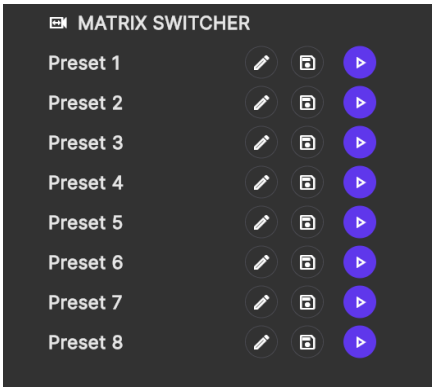
Matrix Switching



- Rename input and output sources (Optional)
- Press and hold an input source.
- Drag the input from the **Inputs panel** to the desired output.
- Release to complete the assignment.
- A single input can be routed to **multiple outputs simultaneously**.

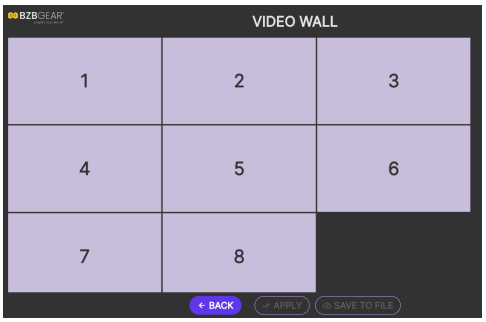
Preset Management

Presets allow quick saving and recall of system configurations.



1. Configure routing or video wall settings.
2. Select **Save as Preset**.
3. Assign a preset number and name.
4. Recall presets at any time to instantly restore configurations.

Video Wall Control



- Select **Create Video Wall**.
- Drag and arrange outputs into the desired layout.
- Select a source to span across the video wall.
- Select **Set Video Wall** to apply.

- Video walls appear on the main screen and support **real-time switching** and **preset storage**.

Pass-Through Mode

Pass-Through mode restores a direct, default input-to-output mapping.
This mode is useful for:

- System resets
- Testing
- Simplified routing

Refresh Data

The **Refresh Data** function resynchronizes the app with the connected switcher.
Use this if configuration changes are made or if the interface appears out of sync.

App Capabilities

- Matrix video routing
- Video wall creation and control
- Preset save and recall
- Audio matrix control *(supported devices)*
- Multi-user access with role-based permissions
- Multi-platform operation

Troubleshooting

Problems	Causes	Solutions
No Power / All LED off	Power supply not connected, connected fully, or wrong power supply.	Check if the power supply is connected correctly and the output voltage value is within recommended specifications.
No sound or sound issues	The HDMI connection is faulty, the audio format is not supported by the displays, or the source player is set to another port for audio output	Check if the HDMI cables are connected correctly. Check if the audio format is supported by the display and that a user has not changed the supported audio format on the player`s audio output. Ensure output settings from the HDMI source device as set correctly.
No picture or picture flickers	The HDMI cable may be faulty or the category cable quality is faulty.	Check if the HDMI and category cable connections are correct and undamaged. Change to another good working HDMI cable or category cable (CAT6 or better cable is recommended).

Tech Support

Have technical questions? We may have answered them already!

Please visit BZBGEAR's support page (bzbgear.com/support) for helpful information and tips regarding our products. Here you will find our Knowledge Base (bzbgear.com/knowledge-base) with detailed tutorials, quick start guides, and step-by-step troubleshooting instructions. Or explore our YouTube channel, BZB TV (youtube.com/c/BZBTVchannel), for help setting up, configuring, and other helpful how-to videos about our gear.

Need more in-depth support? Connect with one of our technical specialists directly:

Phone	**Email**	**Live Chat**
1.888.499.9906	support@bzbgear.com	bzbgear.com

Limited Product Warranty Terms

Pro Line: 5-year warranty from the date of purchase for AV/Broadcasting products bought on or after August 1, 2024.

Essential Line: 3-year warranty from the date of purchase for AV/Broadcasting products bought on or after August 1, 2024.

Cables: Lifetime Limited Product Warranty.

For complete warranty information, please visit bzbgear.com/warranty.

For questions, please call 1.888.499.9906 or email support@bzbgear.com.

Mission Statement

BZBGEAR is a breakthrough manufacturer of high-quality, innovative audiovisual equipment ranging from AVoIP, professional broadcasting, conferencing, home theater, to live streaming solutions. We pride ourselves on unparalleled customer support and services. Our team offers system design consultation, and highly reviewed technical support for all the products in our catalog. BZBGEAR delivers quality products designed with users in mind.

Copyright