BZBGEAR®
Amplify Your World™

BG-MC-SERIES

Modular Seamless 4K60 Matrix Switcher with Video Wall and Control System | HDMI 2.0b, HDCP 2.2, 8×8–36×36 Configurable I/O

User Manual

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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-MC-SERIES Modular Seamless Switching Matrix is a professional, all-in-one AV solution designed for high-performance signal switching, distribution, and control. Supporting up to 8-36 inputs and 8-36 outputs, it integrates a powerful video wall processor and intelligent control system, making it ideal for complex installations. Built on a high-speed, pure hardware matrix switching architecture, it ensures zero compression, zero latency, and no signal loss for seamless and distortion-free performance. With advanced full-digital signal processing and a high-bandwidth backplane, the system supports up to 4K×2K@60Hz (RGB 4:4:4, 24-bit), HDMI 2.0b, 18Gbps video bandwidth, and deep color up to 12 bits - delivering exceptional image clarity and fidelity across all displays.

Designed with a modular pluggable card structure, the matrix offers flexible configuration and easy scalability. Input and output cards are available in multiple formats, including HDMI, DVI-U (DVI/VGA/YPbPr/CVBS), VGA, 3G/HD/SD-SDI, HDBaseT, and optical fiber, with each card providing four channels. The system supports seamless switching without image tearing, flicker, or black screens, and enables advanced Gen-Lock video wall splicing with ultra-low latency (<0.1ms) between output channels. Audio performance is equally versatile, featuring built-in audio embedding on input cards and de-embedding on output cards with support for LPCM 2.0CH analog audio.

Engineered for reliability and control flexibility, the Modular Seamless Switching Matrix supports multiple control options, including front-panel buttons with LCD display, IR remote, RS-232, LAN, PC software, and Web GUI. Its built-in intelligent control system and EDID management provide effortless setup and operation, while 64 scene presets enable fast configuration recall. With its quiet fan design, robust power module, and standard rack-mount form factor, this matrix is perfectly suited for professional applications such as video conferencing, broadcasting, control rooms, government monitoring, education, and corporate AV environments where stable, high-quality signal management is critical.

Features

- **HDCP 2.2 Compliance:** Ensures secure transmission of protected 4K UHD content.
- **HDMI 18Gbps Bandwidth:** Supports resolutions up to 4K60 RGB 4:4:4 24-bit as defined in HDMI 2.0b.
- **Modular Card Design:** Features pluggable cards with four channels per module for flexible configuration.
- **Scalable I/O Capacity:** Supports 8, 16, or 36 channels of video signal inputs and outputs.
- **Versatile Signal Interfaces:** Compatible with HDMI, DVI-U (DVI/VGA/YPbPr/CVBS), VGA, 3G/HD/SD-SDI, HDBaseT, and optical fiber cards.
- **High-Resolution Support:** Delivers video up to 1920×1200@60Hz (2K cards) or 3840×2160@60Hz (4K cards).
- **Seamless Switching:** Provides ultra-smooth transitions with no image tearing, black screens, or flicker.
- **Gen-Lock Synchronization:** Utilizes advanced video wall splicing technology with latency under 0.1ms between outputs.
- **Flexible Video Wall Modes:** Supports splicing configurations from 8×8 to 36×36, ideal for LCD or LED video walls.
- **Multi-Resolution Output:** Offers various output resolutions to match different display types.
- **High-Speed Hardware Switching:** Employs a pure hardware matrix chip for high integration and stability.
- **Signal Optimization:** Includes built-in signal equalization, recovery, and redriving for reliable performance.
- **Video Enhancement Engine:** Allows adjustment of output video quality for optimal display results.
- **Integrated HDCP Logic:** Prevents HDCP compatibility issues for seamless device communication.
- **Audio Embedding/De-Embedding:** Input cards support audio embedding; output cards support de-embedding.
- **Analog Audio Embedding:** Supports LPCM 2.0CH with synchronized analog audio and video input.
- **Analog Audio De-Embedding:** Supports LPCM 2.0CH with synchronized analog audio and video output.
- **Scene Presets:** Stores and recalls up to 64 customizable scene configurations.
- **Advanced EDID Management:** Offers internal EDID settings or the ability to copy from connected displays.
- **Multiple Control Options:** Operate via front panel buttons, IR remote, RS-232, TCP/IP, Web GUI, or PC software.
- **Integrated Control System:** Features an intuitive user interface for streamlined operation.
- **Silent Cooling Design:** Low-noise fans ensure quiet, stable, and reliable performance.

- **Integrated Power Module:** Equipped with an AC power port and built-in power supply.
- **Rack-Mountable Design:** Standard rack size for easy installation and system integration.

Packing List

- 1 x Modular Seamless Switching Matrix
- 1 x IR Remote
- 1 x RS-232 Serial Cable (DP9 female connector to 3pin H2.0 Phoenix Connector, 1.5 meters)
- 1 x USB to RS-232 Serial Cable (USB A to RS-232 serial DB9 male connector)
- 4 x Rubber Foot
- 4 x Machine Screw (M3*4)
- 1 x 100~240V AC 50/60Hz Power Cord (Note: The dual power card is equipped with two AC power cords.)
- 1 x User Manual

Specifications

Category	Details
Technical	• **HDMI Compliance:** 2K series – HDMI 1.4 / 4K series – HDMI 2.0b • **HDCP Compliance:** 2K series – HDCP 1.4 / 4K series – HDCP 2.2 • **Video Bandwidth:** 600MHz / 18Gbps • **Video Resolution:** 2K – 1920×1200@60Hz / 4K – 3840×2160@60Hz 4:4:4 • **Color Depth:** 2K – 8/10/12-bit @1080p60 / 4K – 8/10/12-bit @4K30 & 8-bit @4K60 4:4:4 • **Color Space:** RGB, YCbCr 4:4:4 / 4:2:2 / 4:2:0 • **Audio Formats:** HDMI (LPCM 2.0/5.1/7.1CH), Analog (LPCM 2.0CH) • **ESD Protection:** IEC 61000-4-2 ±8KV (air-gap), ±4KV (contact)
Connection	• **Input Cards:** 8×8 – 2 cards / 16×16 – 4 cards / 36×36 – 9 cards • **Output Cards:** 8×8 – 2 cards / 16×16 – 4 cards / 36×36 – 9 cards • **Control:** 1 main control card (all configurations)
Mechanical	• **Housing:** Metal enclosure, black finish • **Dimensions:** 8×8 – 483×377×89mm / 16×16 – 483×379×133mm / 36×36 – 483×378×266mm • **Weight (without cards):** 8×8 – 5.95kg / 16×16 – 8.62kg / 36×36 – 15.4kg • **Power Supply:** AC 100–240V, 50/60Hz • **Power Consumption:** 8×8 – 40W–190W / 16×16 – 80W–320W / 36×36 – 200W–840W • **Environmental Conditions:** Operating 0°C–40°C (32°F–104°F), Storage -20°C–60°C (-4°F–140°F), Humidity 20–90% RH (no condensation)

Chassis Models

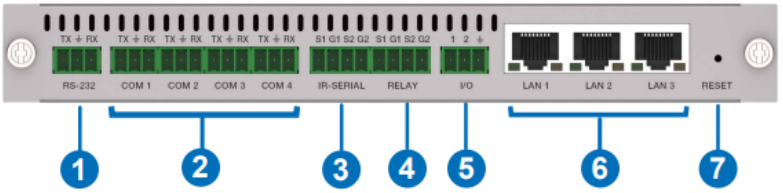
BG-MC-88M

BG-MC-1616M

BG-MC-3636M

Specifications - Main Control Cards

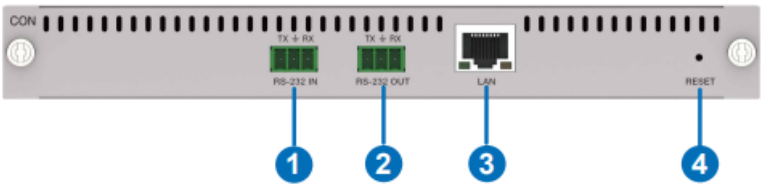
Main Control Card Option 1



BG-MC-CONTROL

No.	Name	Description
1	RS-232 port	Connects to a PC or third-party control processor to transmit RS-232 commands and control the Matrix.
2	COM1-4	Four sets of programmable two-way multi-mode serial ports, 3-pin phoenix connector (male), compliant with RS-232 protocol, configurable with 8 baud rates from 2400-115200bps. Pin-outs are PIN1 for TXD, PIN2 for GND, and PIN3 for RXD.
3	IR-SERIAL	Two sets of 2-PIN phoenix connectors for either IR transmitting or one-way serial signal outputting. In RS-232 mode, supports devices with a 0-5V signal level. Left pin is IR/serial data, right pin is signal GND. Programmable mode: IR transmitting (20K-60KHz) or one-way serial data output (TXD/GND configurable).
4	RELAY	Two sets of isolated, normally open 2-PIN phoenix relay output ports. Each relay can switch up to 2A 30VDC / 1A 125VAC peak. Connector does not support voltage output.
5	I/O	2-channel GPIO dry contact input interface with voltage range 0-24V, capable of collecting digital level signals and low-level signal sensing.
6	LAN1-3	Standard 10M/100M Ethernet RJ45 ports for device access, connecting to a PC or third-party control processor. Defaults to DHCP; pre-set IP is 192.168.0.101 if no router is present. **Notes:** DHCP mode may assign IP 0.0.0.0 if network disconnects—power cycle needed. Static IP mode does not pre-set IP; PC can set pre-set IP manually.
7	Button Press Functions	**Short press (<1s):** no reaction. **Long press (1-5s):** device reboots without uploading user projects. **Long press (>5s):** factory reset—resets IP to DHCP, login password to "admin", time to auto mode; user projects are retained.

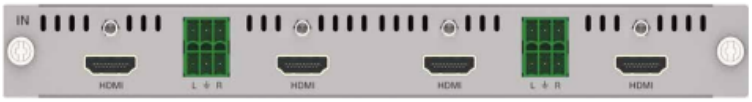
Main Control Card Option 2



No.	Name	Description
1	RS-232 IN port	Input port for RS-232 serial signals. Connects to a PC or third-party control processor to transmit RS-232 commands and control the Matrix.
2	RS-232 OUT port	RS-232 serial signal output port. Functions: 1) Connects to and controls external devices via RS-232 commands. 2) Connects to other Matrix devices for cascading.
3	LAN	Standard 10M/100M Ethernet RJ45 port for device access. Connects to a PC or third-party control processor to control the Matrix.
4	RESET button	Restores the device to factory settings. Long-press for more than 10 seconds after boot, then release. Resets MCU configuration.

Specifications - Input & Output Cards

(1) 2K Input Cards



BG-MC-IN-HDMI-2K

Signal Channel	**4-Channel HDMI Input Signals**
Resolution	**PC:** 640x480p60Hz – 1920x1200p60Hz; **Video:** 480i59/480p59, 576i50/576p50, 720p50/59/60, 1080i50/59/60, 1080p23/24/25/29/30/50/59/60, 1200p60
HDMI Compliance	HDMI 1.4, HDCP 1.4
Video Bandwidth	6.75 Gbps
Color Depth	8/10/12-bit at 1080p60Hz
Audio Input	External LPCM 2.0CH via 3.81mm Phoenix Connector
Max Transmission Distance	15 meters for HDMI 1080p60Hz
Status Indicator	Displays "NO SIGNAL" if no input is detected

(2) 2K HDBT 70M Input Card

BG-MC-IN-HDBT70-2K

Signal Channel	**4-Channel HDMI/HDBT Input Signals**
Supported Resolutions	**PC:** 640x480p60Hz – 1920x1200p60Hz; **Video:** 480i59/480p59, 576i50/576p50, 720p50/59/60, 1080i50/59/60, 1080p23/24/25/29/30/50/59/60, 1200p60
HDCP Compliance	HDCP 1.4
Video Bandwidth	6.75 Gbps

Color Depth	8/10/12-bit at 1080p60Hz
Audio Input	LPCM 2.0CH via 3.81mm Phoenix Connector
HDBT Port	RJ45 Connector
Max Transmission Distance	70 meters for HDBT 1080p60Hz
Status Indicator	Displays "NO SIGNAL" if no input is detected

(3) 2K HDBT 100M Input Card

BG-MC-IN-HDBT100-2K

Signal Channel	**4-Channel HDBT Input Signals**
Supported Resolutions	**PC:** 640x480p60Hz – 1920x1200p60Hz; **Video:** 480i59/480p59, 576i50/576p50, 720p50/59/60, 1080i50/59/60, 1080p23/24/25/29/30/50/59/60, 1200p60
HDCP Compliance	HDCP 1.4
Video Bandwidth	6.75 Gbps
Color Depth	8/10/12-bit at 1080p60Hz
Audio Input	LPCM 2.0CH via 3.81mm Phoenix Connector
HDBT Port	RJ45 Connector
Max Transmission Distance	100 meters for HDBT 1080p60Hz
Status Indicator	Displays "NO SIGNAL" if no input is detected

(4) 2K HDBT 150M Input Card

BG-MC-IN-HDBT150-2K

Signal Channel	**4-Channel HDBT Input Signals**
Supported Resolutions	**PC:** 640x480p60Hz – 1920x1200p60Hz; **Video:** 480i59/480p59, 576i50/576p50, 720p50/59/60, 1080i50/59/60, 1080p23/24/25/29/30/50/59/60, 1200p60
HDCP Compliance	HDCP 1.4
Video Bandwidth	6.75 Gbps
Color Depth	8/10/12-bit at 1080p60Hz
Audio Input	LPCM 2.0CH via 3.81mm Phoenix Connector
HDBT Port	RJ45 Connector
Max Transmission Distance	150 meters for HDBT 1080p60Hz
Status Indicator	Displays "NO SIGNAL" if no input is detected

(5) 2K SDI Input Card

BG-MC-IN-SDI-2K

Signal Channel	**4-Channel SDI Input Signals**
Supported Resolutions & Formats	720x480i59.94Hz – 1920x1080p60Hz; HD-SDI/3G-SDI formats: SMPTE 292M, 425M, 424M, 259M-C; interlaced and progressive scan
Color Depth	8-bit at 1080p60Hz
Video Bandwidth	2.97 Gbps
Impedance	75Ω
Audio Input	LPCM 2.0CH via 3.81mm Phoenix Connector

SDI Port	BNC/female
Max Transmission Distance	100 meters for SDI 1080p60Hz

(6) 2K VGA Input Card

BG-MC-IN-VGA-2K

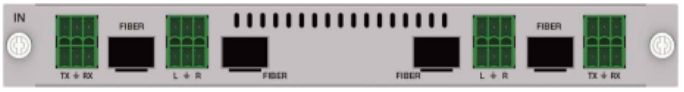
Signal Channel	**4-Channel VGA Input Signals**
Supported Resolutions & Format	640x480p60Hz – 1920x1200p60Hz, RGB (Analog), 8-bit color depth at 1080p60Hz
Video Bandwidth	4.95 Gbps
Impedance	75Ω
Horizontal Scan Frequency	15KHz – 90KHz
Synchronization Type	RGBHV
Nominal Level	0.7 Vp-p
Audio Input	LPCM 2.0CH via 3.81mm Phoenix Connector
VGA Port	DB15, 15-pin female
Max Transmission Distance	10 meters for VGA 1080p60Hz
Status Indicator	Displays "NO SIGNAL" if no input is detected

(7) 2K DVI Input Card

BG-MC-IN-DVIU-2K

Signal Channel	4-Channel DVI Input Signals
Supported Resolutions & Formats	HDMI/DVI: 640x480p60Hz – 1920x1200p60Hz, 1080p23.98–60Hz, 1200p60Hz; VGA: 640x480–1920x1200p60Hz; YPbPr: 480i60, 576i50, 720p50/60, 1080i50/60, 1080p50/60; CVBS: 720x480i60_PAL, 720x576i50_NTSC
Color Depth	8-bit at 1080p60Hz
Video Bandwidth	4.95 Gbps
Audio Input	LPCM 2.0CH via 3.81mm Phoenix Connector
DVI Port	DVI-I, 28-pin female
Max Transmission Distance	15 meters for DVI 1080p60Hz
Status Indicator	Displays "NO SIGNAL" if no input is detected

(8) 2K FIBER Input Card



BG-MC-IN-FIBER-2K

Signal Channel	4-Channel FIBER Input Signals
Supported Resolutions	640x480p60Hz – 1920x1200p60Hz, including SD (720x480i/p) and HD (1920x1080p/i) at 50/59.94/60Hz, interlaced and progressive
Color Depth	8/10/12-bit at 1080p60Hz
Video Bandwidth	6.75 Gbps
Audio Input	LPCM 2.0CH via 3.81mm Phoenix Connector
SFP Port	SFP_HOST, 20-pin female

Max Transmission Distance	10KM (single-mode fiber) / 300M (multi-mode fiber)
Status Indicator	Displays "NO SIGNAL" if no input is detected

2K Output Cards

(1) 2K HDMI Output Card / 2K HDMI-V Output Card

BG-MC-OUT-HDMI-2K

Signal Channel	**4-Channel HDMI Output Signals**
Supported Resolutions	1024x768p60Hz – 1920x1200p60Hz (selectable via control software)
HDMI Compliance	HDMI 1.4
HDCP Compliance	HDCP 1.4
Video Bandwidth	4.95 Gbps
Color Depth	8-bit at 1080p60Hz
Audio Output	Stereo analog LPCM 2.0CH via 3.81mm Phoenix Connector
HDMI Port	Type A
Max Transmission Distance	15 meters for HDMI 1080p60Hz

(2) 2K HDBT 70M Output Card

BG-MC-OUT-HDBT70-2K

Signal Channel	**4-Channel HDBT Output Signals**
Supported Resolutions	1024x768p60Hz – 1920x1200p60Hz (selectable via control software)

HDCP Compliance	HDCP 1.4
Video Bandwidth	4.95 Gbps
Color Depth	8-bit at 1080p60Hz
Audio Output	Stereo analog LPCM 2.0CH via 3.81mm Phoenix Connector
HDBT Port	RJ45 Connector
Max Transmission Distance	70 meters for HDBT 1080p60Hz

(3) 2K HDBT 100M Output Card

BG-MC-OUT-HDBT100-2K

Signal Channel	**4-Channel HDBT Output Signals**
Supported Resolutions	1024x768p60Hz – 1920x1200p60Hz (selectable via control software)
HDCP Compliance	HDCP 1.4
Video Bandwidth	4.95 Gbps
Color Depth	8-bit at 1080p60Hz
Audio Output	Stereo analog LPCM 2.0CH via 3.81mm Phoenix Connector
HDBT Port	RJ45 Connector
Max Transmission Distance	100 meters for HDBT 1080p60Hz

(4) 2K HDBT 150M Output Card

BG-MC-OUT-HDBT150-2K

Signal Channel	**4-Channel HDBT Output Signals**
Supported Resolutions	1024x768p60Hz – 1920x1200p60Hz (selectable via control software)
HDCP Compliance	HDCP 1.4
Video Bandwidth	4.95 Gbps
Color Depth	8-bit at 1080p60Hz
Audio Output	Stereo analog LPCM 2.0CH via 3.81mm Phoenix Connector
HDBT Port	RJ45 Connector
Max Transmission Distance	150 meters for HDBT 1080p60Hz

(5) 2K SDI Output Card

BG-MC-OUT-SDI-2K

Signal Channel	**4-Channel SDI Output Signals**
Supported Resolutions & Formats	720x480i60 – 1920x1080p60; HD-SDI (SMPTE 292M), 3G-SDI (SMPTE 424M/425M-AB)
Color Depth	8-bit at 1080p60Hz
Video Bandwidth	2.97 Gbps
Impedance	75Ω
Audio Output	Stereo analog LPCM 2.0CH via 3.81mm Phoenix Connector
SDI Port	BNC/female
Max Transmission Distance	100 meters for SDI 1080p60Hz

(6) 2K VGA Output Card

BG-MC-OUT-VGA-2K

Signal Channel	**4-Channel VGA Output Signals**
Supported Resolutions & Format	1024x768p60Hz – 1920x1200p60Hz, RGB (Analog), selectable via control software
Color Depth	8-bit at 1080p60Hz
Video Bandwidth	4.95 Gbps
Impedance	75Ω
Horizontal Scan Frequency	15KHz – 90KHz
Synchronization Type	RGBHV
Nominal Level	0.7 Vp-p
Audio Output	Stereo analog LPCM 2.0CH via 3.81mm Phoenix Connector
VGA Port	DB15, 15-pin female
Max Transmission Distance	10 meters for VGA 1080p60Hz

(7) 2K DVI Output Card

BG-MC-OUT-DVIU-2K

Signal Channel	**4-Channel DVI Output Signals**
Supported Resolutions & Formats	HDMI/DVI: 1280x720p50 – 1920x1200p60; VGA: 1280x720p50 – 1920x1200p60; YPbPr: 1280x720p60, 1920x1080p60; CVBS: 720x480i60_PAL, 720x576i50_NTSC
Signal Format	DVI-I full digital TMDS, compliant with DVI 1.0
Color Depth	8-bit at 1080p60Hz
Video Bandwidth	4.95 Gbps

Audio Output	Stereo analog LPCM 2.0CH via 3.81mm Phoenix Connector
DVI Port	DVI-I, 28-pin female
Max Transmission Distance	15 meters for DVI 1080p60Hz

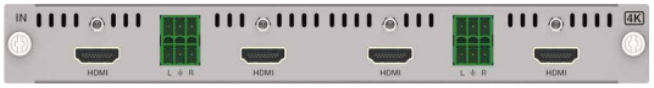
(8) 2K FIBER Output Card

BG-MC-OUT-FIBER-2K

Signal Channel	**4-Channel FIBER Output Signals**
Supported Resolutions	1024x768p60 – 1920x1200p60, including 720p/1080p at 24/25/30/50/60Hz, 1600x1200p60; selectable via control software
Color Depth	8-bit at 1080p60Hz
Video Bandwidth	4.95 Gbps
Audio Output	Stereo analog LPCM 2.0CH via 3.81mm Phoenix Connector
SFP Port	SFP_HOST, 20-pin female
Max Transmission Distance	10KM (single-mode fiber) / 300M (multi-mode fiber)

4K Input Cards

(1) 4K HDMI Input Card



BG-MC-IN-HDMI-4K

Signal Channel	**4-Channel HDMI Input Signals**
Supported Resolutions	640x480p60Hz – 4096x2160p60Hz (4K)
HDMI Compliance	HDMI 2.0b
HDCP Compliance	HDCP 2.2
Video Bandwidth	18 Gbps
Color Depth	8/10/12-bit
Audio Input	LPCM 2.0CH via 3.81mm Phoenix Connector
HDMI Port	HDMI Type A
Max Transmission Distance	HDMI 1080p60: 15m; 4K30Hz: 10m; 4K60Hz: 8m

(2) 4K HDBT 70M Input Card

BG-MC-IN-HDBT70-4K

Signal Channel	**4-Channel HDBT Input Signals**
Supported Resolutions	SD: 640x480p60, 720x480i/p, 720x576i/p; HD: 1280x720p50/59/60, 1920x1080p23.98–60, common PC resolutions; UHD: 3840x2160p24/25/30/50/60, 4096x2160p24/25/30/50/60
HDCP Compliance	HDCP 2.2
Video Bandwidth	18 Gbps
Color Depth	8/10/12-bit

Audio Input	LPCM 2.0CH via 3.81mm Phoenix Connector
HDBT Port	RJ45 Connector
Max Transmission Distance	1080p60: 70m; 4K30/60: 40m

(3) 4K HDBT 100M Input Card

BG-MC-IN-HDBT100-4K

Signal Channel	**4-Channel HDBT Input Signals**
Supported Resolutions	SD: 640x480p60, 720x480p59.94; UHD: 3840x2160p60, 4096x2160p60; various frame rates 23.98–60Hz
HDCP Compliance	HDCP 2.2
Video Bandwidth	18 Gbps
Color Depth	8/10/12-bit
Audio Input	LPCM 2.0CH via 3.81mm Phoenix Connector
HDBT Port	RJ45 Connector
Max Transmission Distance	HDBT 1080p60: 100m; 4K30/60: 70m

(4) 4K HDBT 150M Input Card

BG-MC-IN-HDBT150-4K

Signal Channel	**4-Channel HDBT Input Signals**
Supported Resolutions	SD: 640x480p60~; HD: 1920x1200p60, 1080p various frame rates; UHD: 3840x2160p60, 4096x2160p60
HDCP Compliance	HDCP 2.2

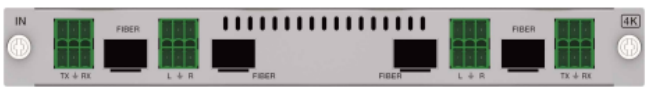
Video Bandwidth	18 Gbps
Color Depth	8/10/12-bit
Audio Input	LPCM 2.0CH via 3.81mm Phoenix Connector
HDBT Port	RJ45 Connector
Max Transmission Distance	1080p60/4K30: 150m; 4K60: 120m

(5) 4K SDI Input Card

BG-MC-IN-SDI-4K

Signal Channel	**2-Channel 12G SDI Input & Loop Output, 2-Channel HDMI Input**
Supported Resolutions	HDMI: 640x480p60 – 4096x2160p60, various frame rates 23.98–60Hz; SDI: 720p50/60, 1080i50/60, 1080p50/60, 4Kx2K 24/25/30/50/60Hz
Color Depth	8/10/12-bit
Video Bandwidth	HDMI: 18 Gbps; SDI: 12 Gbps
Impedance	HDMI: 100Ω differential; SDI: 75Ω single-end
Audio Input	LPCM 2.0CH via 3.81mm Phoenix Connector
Video Ports	HDMI: Type A female; SDI: BNC female
Max Transmission Distance	HDMI 4K60: 8m; SDI 3G/6G: 100m; SDI 12G: 60m

(6) 4K FIBER Input Card



BG-MC-IN-FIBER-4K

Signal Channel	**4-Channel FIBER Input Signals**

Supported Resolutions	SD: 640x480p60~; UHD: 3840x2160p60, 4096x2160p60; various frame rates and interlaced/progressive scan options
Color Depth	8/10/12-bit
Video Bandwidth	18 Gbps
Audio Input	LPCM 2.0CH via 3.81mm Phoenix Connector
SFP Port	SFP_HOST, 20-pin female
Max Transmission Distance	Single-mode: 10KM; Multi-mode: 300M

4K Output Cards

(1) 4K HDMI Output Card

BG-MC-OUT-HDMI-4K

Signal Channel	**4-Channel HDMI Output Signals**
Supported Resolutions	720x480i60 – 4096x2160p60, including 1080p, 1440p, and 4K at various frame rates
HDMI Compliance	HDMI 2.0b
HDCP Compliance	HDCP 2.2
Video Bandwidth	18 Gbps
Color Depth	8/10/12-bit
Audio Output	Stereo analog LPCM 2.0CH via 3.81mm Phoenix Connector
HDMI Port	Type A
Max Transmission Distance	1080p60: 15m; 4K30: 10m; 4K60: 8m

(2) 4K HDBT 70M Output Card

BG-MC-OUT-HDBT70-4K

Signal Channel	**4-Channel HDBT Output Signals**
Supported Resolutions	SD: 720x480i60, 720x576i50; UHD: 3840x2160p60, 4096x2160p60
HDCP Compliance	HDCP 2.2
Video Bandwidth	18 Gbps
Color Depth	8/10/12-bit
Audio Output	Stereo analog LPCM 2.0CH via 3.81mm Phoenix Connector
HDBT Port	RJ45 Connector
Max Transmission Distance	1080p60: 70m; 4K30/60: 40m

(3) 4K HDBT 100M Output Card

BG-MC-OUT-HDBT100-4K

Signal Channel	**4-Channel HDBT Output Signals**
Supported Resolutions	SD: 720x480i60, 720x576i50; UHD: 3840x2160p60, 4096x2160p60
HDCP Compliance	HDCP 2.2
Video Bandwidth	18 Gbps
Color Depth	8/10/12-bit
Audio Output	Stereo analog LPCM 2.0CH via 3.81mm Phoenix Connector
HDBT Port	RJ45 Connector
Max Transmission Distance	1080p60: 100m; 4K30/60: 70m

(4) 4K HDBT 150M Output Card

BG-MC-OUT-HDBT150-4K

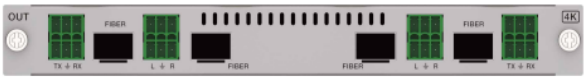
Signal Channel	**4-Channel HDBT Output Signals**
Supported Resolutions	720x480i60 – 4096x2160p60
HDCP Compliance	HDCP 2.2
Video Bandwidth	18 Gbps
Color Depth	8/10/12-bit
Audio Output	Stereo analog LPCM 2.0CH via 3.81mm Phoenix Connector
HDBT Port	RJ45 Connector
Max Transmission Distance	1080p60/4K30: 150m; 4K60: 120m

(5) 4K SDI Output Card

BG-MC-OUT-SDI-4K

Signal Channel	**2-Channel 12G SDI Output, 2-Channel HDMI Output**
Supported Resolutions	HDMI: 640x480p60 – 4096x2160p60, various frame rates; SDI: 720p50/60, 1080i50/60, 1080p50/60, 4Kx2K 24/25/30/50/60Hz
Color Depth	8/10/12-bit
Video Bandwidth	HDMI: 18 Gbps; SDI: 12 Gbps
Impedance	HDMI: 100Ω differential; SDI: 75Ω single-end
Audio Output	Stereo analog LPCM 2.0CH via 3.81mm Phoenix Connector
Video Ports	HDMI: Type A female; SDI: BNC female
Max Transmission Distance	HDMI 1080p: 15m; HDMI 4K60: 8m; SDI 3G/6G: 100m; SDI 12G: 60m

(6) 4K FIBER Output Card



BG-MC-OUT-FIBER-4K

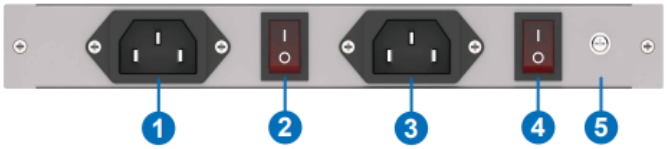
Specification	Details
Signal Channel	4-channel FIBER output signals
Resolution	Supports a wide range, from 640x480p60Hz up to 4096x2160p60Hz
Color Depth	8/10/12-bit
Video Bandwidth	18Gbps
Audio	Supports stereo analog audio output (LPCM 2.0CH)
Audio Port	3.81mm Phoenix Connector
SFP Port	SFP_HOST, 20-pin female
Max Transmission Distance	Single mode fiber: 10KM, multi-mode fiber: 300M

Specifications-Power Cards

Single Power Card (optional 1)

Number	Name	Function Description
1	Power port	This is used to connect the power input port to an AC power supply using the included power cord.
2	Power switch	This is pressed to power the system on or off.
3	GND	This is used for connecting the ground or the earthing conductor of a rack.

Dual Power Card (optional 2)



Number	Name	Function Description
1	Power port	Connects to the AC power supply using the included power cord.
2	Power switch	Powers the system on or off.
3	Redundant power port	Provides power to a faulty device from a redundant power supply if the main power supply fails, ensuring continuous operation.
4	Redundant power switch	Powers the system on or off when using the redundant power supply.
5	GND	Used for connecting the ground or the earthing conductor of the rack.

Specifications-Blank Card

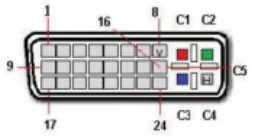
Note: If the Matrix is not fully populated with cards, placeholder (blank) cards will be added automatically.

Specifications-Signal Adapters

The DVI card includes three signal adapters, allowing DVI output to be converted to HDMI, VGA, or YPbPr/CVBS. Users can select and use the appropriate adapter as needed.

DVI Male to HDMI Female Adapter

DVI-I connector



Pin	Function
1	TMDS data 2-
2	TMDS data 2+
3	TMDS data GND
4	Reserved
5	Reserved
6	TMDS_ DDC clock
7	TMDS_ DDC data
9	TMDS data 1-
10	TMDS data 1+
11	TMDS data GND
12	Reserved
13	Reserved
14	TMDS +5V
15	TMDS data GND
16	TMDS_ HPD
17	TMDS data 0-
18	TMDS data 0+
19	TMDS data GND
20	Reserved
21	Reserved
22	TMDS data GND
23	TMDS data C+
24	TMDS data C-

DVI Male to VGA Female Adapter

VGA Connector Pin Definition List

Pin	Function
C1	Analog video signal Red
C2	Analog video signal Green
C3	Analog video signal Blue
C4	Analog video signal Hsync
C5	Analog video signal GND
8	Analog video signal Vsync

DVI Male to YPbPr/CVBS Female Adapter

YPbPr/CVBS Connector Pin Definition List

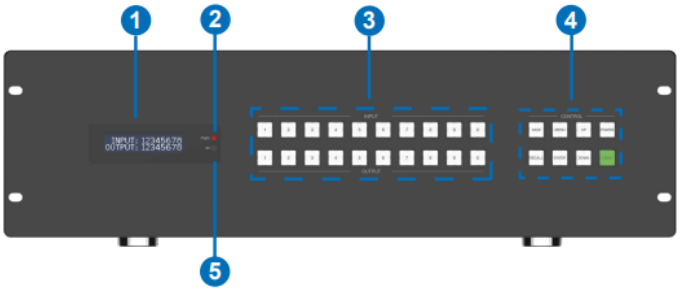
Pin	Function
C3	Y channel luminance
C2	Pb channel blue chrominance
C1	Pr channel red chrominance

Pin	Function
C2	Composite synchronous video signal (CVBS)

Operation and Use

Panel Introduction and Operation (16x16 Matrix as an example)

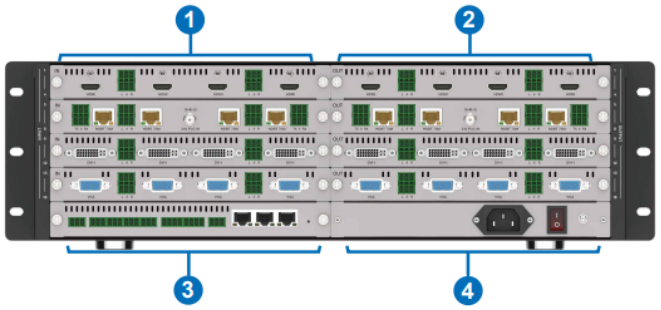
Front Panel



Number	Name	Function Description
1	LED screen	Displays current status information, such as matrix switching channels, EDID information, and baud rate.
2	PWR LED	Indicates the system's power status. Green when powered on, red when in standby.
3	INPUT & OUTPUT buttons (0-9)	Used to select input and output channels for matrix switching. Press an input button, then an output button, and finally "ENTER" to complete the switch. Channels exceeding 16 prompt an out-of-range message.
4	Control buttons	SAVE: Save up to 64 display scenes (press SAVE → UP/DOWN → ENTER). MENU: Enter menu function settings (UP/DOWN → ENTER). UP/DOWN: Navigate selections on the display screen. POWER: Hold 3s for standby; press again to resume. RECALL: Recall saved scenes (RECALL → UP/DOWN → ENTER). ENTER: Confirms operations and saves settings. LOCK: Lock/unlock current settings and panel buttons.
5	IR window	IR receiver window that only receives signals from the product's remote.

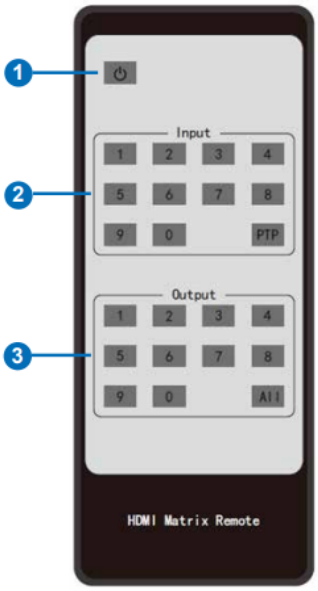
Panel Introduction and Operation (16x16 Matrix as an example)

Rear Panel



Number	Name	Function Description
1	Input cards	Used for video input and connects to source devices either directly or through an Extender.
2	Output cards	Handle video output and connect to display devices directly or via an Extender.
3	Main Control card	Serves as the primary control unit and is equipped with various control ports.
4	Power card	Provides power and includes a power port, a power switch, and a ground port.

Remote Control Introduction and Operation



① **Power button:** Turns the Matrix on or sets it to standby mode.
② **Input 1–36:** Selects the desired input channel.
③ **Output 1–36:** Selects the desired output channel.
The IR Remote supports three operation methods (using the 36×36 Matrix as an example):

Method 1 – Single Input to Single Output:

1. Press the desired input button.
2. Press the desired output button to switch the input signal to the display device.

Example:

- Press Input-Y (Y = 01 to 36)
- Press Output-X (X = 01 to 36)

Note: Always use double-digit input for channels. For channels below 10, press 0 first, then the channel number.

- **Example:** To switch input 1 to output 1, press Input 0 1, then Output 0 1.

Method 2 – PTP (Point-to-Point) Switching:

- Press the PTP button.
- All input channels are automatically mapped to all output channels in one-to-one correspondence.

Method 3 – Single Input to All Outputs:

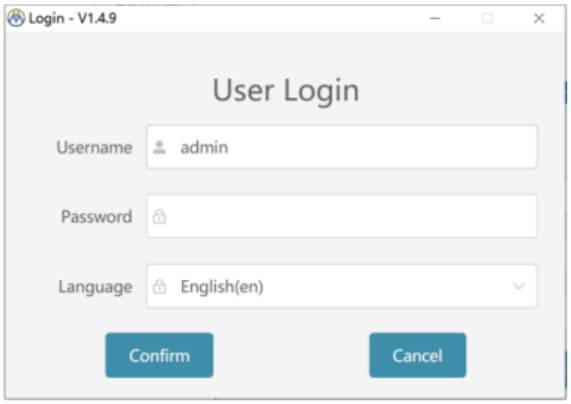
1. Press the desired input button.
2. Press the All button.

- The selected input channel signal will be sent to all display devices.

Host Computer & Web GUI Operation Guide

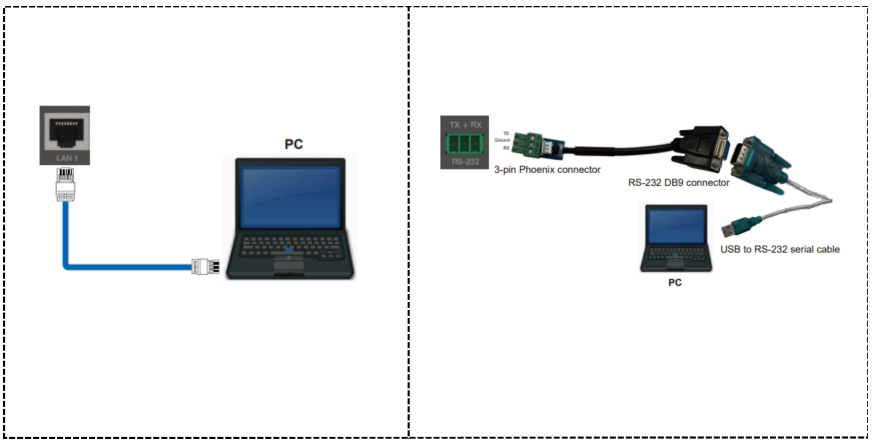
(Example: 36×36 Matrix)

1. Login & Connection



1. **Login via Host Computer**:
   - Double-click the Host Computer icon → enter **username** and **password** (default: admin/admin) → select language → click **Confirm**.
   - Password can be reset in **System Settings**.

2. **Connection Methods**: Network or Serial Port.



3. **Web GUI Login**:
   - Enter the Matrix IP in a browser. Default IP: 192.168.0.100.
   - Username & password: admin/admin. Select language → **User Login**.

2. Matrix Switching Page

Two UI styles available; switch via **"Switch UI"** button.

Common Functions:

- **Refresh Data (①)**: Refresh current page.
- **Power (②)**: Power on / standby.
- **Logout (③)**: Return to login interface.

Matrix Operations:

1. **Rename Port**:
    - UI1: Click port → edit → click outside.
    - UI2: Double-click port → edit → click **Modify**.
    - Names: max 32 English / 16 Chinese characters.

2. **Switch Matrix**:
    - UI1: Click input → output grid (or "All") → set.
    - UI2: Click input → output (or "All") → click **Switch**.
    - Active outputs: green; selected outputs: yellow.

3. **AV Mute**: Click output grid → mute output. "All" mutes all outputs.

---

3. Presets & Configuration

- **Save Preset**: Choose preset ID → name → **Confirm**.
- **Recall Preset**: Select preset ID → **Perform**.
- **Import Config**: Select file → **Confirm**. System returns to login after import.
- **Export Config**: Select save location → **Confirm**.
- **EDID Management**:
    - Export: Select input → choose address → **Save**.
    - Import: Select address → choose file → **Import**.

---

4. Signal & Picture Settings

- **Input Card**: Configure audio source (bypass/embedding) and EDID.
  Notes: 2K VGA input fixed to Audio Embedding; some cards do not support EDID.
- **Output Card**: Configure resolution & mirroring.
  Notes: Some 2K cards and CVBS/YPbPr modes do not support mirroring.
- **Picture Quality & Position**:
    - Select output → adjust brightness, contrast, chroma, sharpness, H/V position & size → click **Read** → refresh.
    - Range: 0–32; reset defaults to 16.
    - Supported only on output ports; certain 2K cards not supported.

---

5. Video Wall Settings

1. **Create Video Wall**:
    - Enter name → set rows/columns (1–36) → select **Synchronous Mode** → **Save**.
    - Drag screens to group (gray → blue) → right-click → **Screen Splicing**.
    - Unsupported on certain 2K output cards.

2. **Save/Recall Preset**: Same steps as matrix presets.
3. **Screen Settings**: View/configure input, output, and parameters. Spliced screens cannot be configured individually.

---

6. System Settings

1. **Network**: Set Static or DHCP IP. Save to apply.
2. **User Password**: Enter old/new/confirm → **Save** → system returns to login.
3. **System Operations**:
    - **Reboot** → confirm.
    - **Factory Reset** → confirm.
4. **Serial Port Pass-through**: Add ASCII/HEX commands → select baud rate → click **Send**.

---

7. System Upgrade

- Select upgrade file → click **Upgrade**. Device reboots after completion.
- Export current version info via **Export Version**.

---

8. Screen Setting (Manufacturer Commands)

1. **Add Manufacturer**: Enter name & baud rate → **Confirm**.
2. **Add Power On/Off Commands**:
    - Select manufacturer → enter commands → **Setting**. Hex option available.
3. **Add Other Commands**: Enter name & command → **Add Command**.
4. **Send Commands**:
    - Method 1: Select manufacturer → enter command → **Send**.
    - Method 2: Use **Screen Poweron/Poweroff** on main interface.
    - Other commands: select → **Send Command** or double-click to send.

API Control (16x16 Matrix as an example)

This Matrix supports control via API commands. To use this feature, connect the Matrix's RS-232 or LAN port to a PC, then launch a command tool on the PC to send ASCII commands for controlling the Matrix.

The ASCII command list for this product is provided below.

Command Code	Function Description	Example	Feedback	Default Setup
s power z!	Power on/off the device, z=0~1 (0=off, 1=on)	s power 1!	System Initializing… Initialization Finished! FW version x.xx.xx	power on
r power!	Get current power state	r power!	power on/power off	power on
s reboot!	Reboot the device	s reboot!	reboot… System Initializing… Initialization Finished! FW version x.xx.xx	-
help!	List all commands	help!	-	-
r type!	Get device model	r type!	hdp-mx91616m	-
r status!	Get device current status	r status!	Get all status: power, beep, lock, in/out connection, video/audio crosspoint, EDID, scaler, network status	-

r fw version!	Get firmware version	r fw version!	ctl-boot:v0.00.00 ctl-app:v1.00.01 rs02:v1.13 key-boot:v1.00.01 key-app:v1.00.01 in board 1:v1.00.01-1.08/1.08/1.08/1.08 … out board 4:v1.00.02	-
r inport x info!	Get information of input port x, x=0~16 (0=all inputs)	r inport 1 info!	Input info: board, type, name, EDID, resolution, audio mode, HDCP, input timing, MCU version	-
r outport x info!	Get information of output port x, x=0~16 (0=all outputs)	r outport 1 info!	Output info: board, type, name, TV state, EDID, resolution, HDCP, mute, mirror, input timing, MCU version	-
s input x name yyy!	Set input port name (≤16 characters)	s input 1 name xiaomi2!	Set input 1 name: xiaomi2	-
s output x name yyy!	Set output port name (≤16 characters)	s output 1 name xiaomiTV!	Set output 1 name: xiaomiTV	-

s reset!	Reset system to factory defaults	s reset!	Reset to factory defaults	Main card: PTP; DHCP; 115200; buzzer on; panel unlocked; LCD 60s; HDMI card: output 1–16 resolution 1920x1080p60; HDCP ON; Splicing No; Position H:16,16 …
s beep z!	Enable/Disable buzzer, z=0~1	s beep 1!	beep on/off	beep on
r beep!	Get buzzer state	r beep!	beep on/off	beep on
s lock z!	Lock/unlock front panel buttons, z=0~1	s lock 1!	panel button lock on/off	lock off
r lock!	Get panel button lock state	r lock!	panel button lock on/off	lock off
s save preset z!	Save current switch state to preset z, z=1~64	s save preset 1!	Saved to preset 1	-
s recall preset z!	Recall preset z, z=1~64	s recall preset 1!	Recall from preset 1	-
s clear preset z!	Clear preset z, z=1~64	s clear preset 1!	Clear preset 1	-
s lcd on time z!	Set LCD remain-on time, z=0–4 (0=off,1=always,2=30s,3=60s,4=5m)	s lcd on time 2!	lcd on 30 seconds	lcd on 60 seconds
r lcd mode!	Get LCD backlight status	r lcd mode!	lcd always on	-

r preset z!	Get preset z information, z=1~64	r preset 2!	Shows all preset 2 data: beep, lock, lcd time, baudrate, output sources, video wall name, mosaic info	-
s baud rate x!	Set external serial port baud rate (1:115200,2:57600,3:38400,4:19200,5:9600,6:4800)	s baud rate 1!	Baudrate:115200	115200
r baud rate!	Get external serial port baud rate	r baud rate!	Baudrate:115200	115200
r activation!	Get system authorization status	r activation!	activated permanently	activated permanently
s in x av out y,z,a,b…!	Set input x to outputs y,z,a,b, x=1~16, y/z/a/b=0~16 (0=all outputs)	s in 1 av out 2,3,4,8!	input 1 -> output 2 3 4 8	-
r av out y!	Get output y signal status, y=0~16 (0=all outputs)	r av out 0!	input 1 -> output 1 … input 16 -> output 16	-
r switch and mute!	Get all output switch & mute status	r switch and mute!	Shows mapping of inputs to outputs and stream on/off	-
s ptp!	Set input/output to PTP mode	s ptp!	ptp	ptp
s input x audio mode y!	Set input x audio mode, x=0~16 (0=all inputs), y=0-follow video,1-insert	s input 1 audio mode 1!	set input 1 audio mode: insert	bypass
r input x audio mode!	Get input x audio mode, x=0~16	r input 1 audio mode!	input 1 audio mode: bypass	bypass
s output x mirror mode y!	Set output x mirror mode, x=0~16 (0=all outputs), y=0~3 (0:OFF,1:H,2:V,3:H+V)	s output 13 mirror mode 2!	set output 13 mirror mode: h+v	off

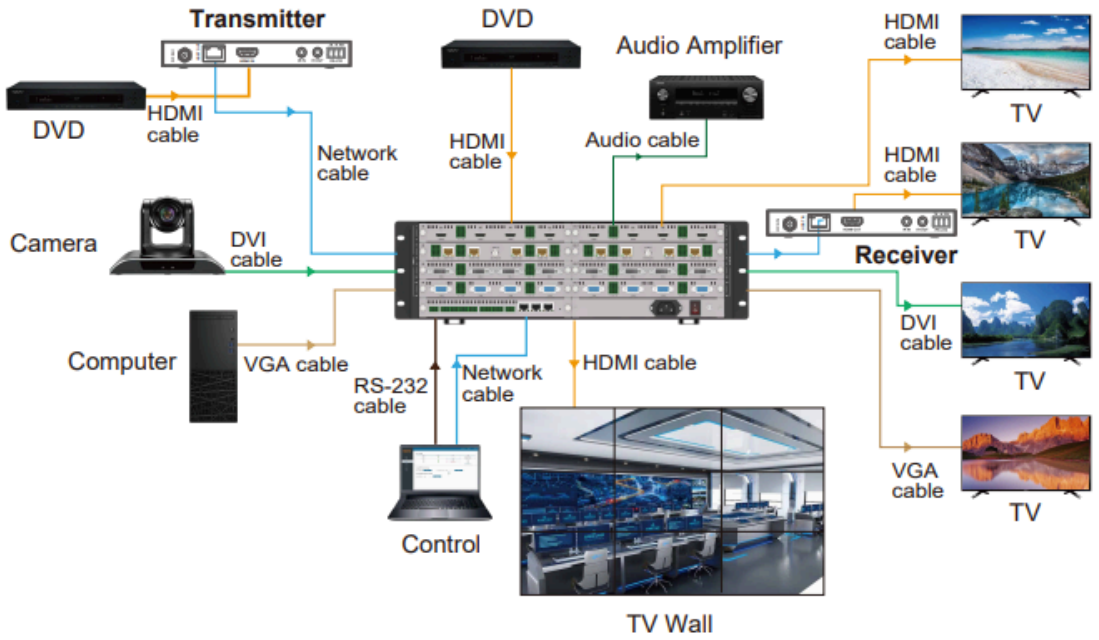
r output x mirror mode!	Get output mirror mode	r output 1 mirror mode!	output 1 mirror mode: off	off
r output x picture info!	Get output x picture info	r output 1 picture info!	brightness=16, contrast=16, colortemp=16, sharpness=16	-
s ir x!	Enable/Disable IR, x=0/1	s ir 1!	enable/disable IR	disable
s output x out mode y!	Set output x out mode when no signal, x=0~16, y=0-“NO SIGNAL”,1-no output	s output 1 out mode 1!	output 1 out mode 1	0
s output x resolution y!	Set output x resolution (varies by card type)	s output 13 resolution 8!	1920x1080@60 / 1920x1080p@30	1920x1080p@60
r output x resolution!	Get output x resolution	r output 1 resolution!	output 1 resolution: 1920x1200p@60	1920x1200p@60
r vw info!	Get video wall info	r vw info!	name:111, col:4, row:4, output:1-16, input:1/7 …, mosaic info	-
create vw row x col y name z!	Create video wall, x=row, y=col, z=name ≤32	create vw row 4 col 4 name video wall 1!	create video wall success	-
s screen x source y!	Set input y to screen x	s screen 1 source 1!	set screen 1 source: input 1	-
s screen x output y!	Set output y to screen x	s screen 1 output 1!	set screen 1 output: 1	-
s mosiac x col y row z!	Create mosaic, x=mosaic ID, y=cols, z=rows	s mosiac 1 col 2 row 2!	set mosaic success	-
s mosaic x window y screen z!	Match mosaic window with screen, x=mosaic ID, y=window, z=screen ID	s mosaic 1 window 1 screen 8!	set mosaic window success	-

delete mosaic x!	Delete mosaic x	delete mosaic 1!	delete mosaic 1 success	-
s sync mode x!	Set mosaic sync mode, x=0-no sync,1-sync	s sync mode 1!	set sync mode 1	0
s hdmi y stream z!	Set output y HDMI stream on/off, y=0~16, z=0/1	s hdmi 1 stream 1!	output 1 stream: on	enable
r hdmi y stream!	Get output y HDMI stream status	r hdmi 1 stream!	output 1 stream: off	-
s edid in x from y!	Set input x EDID from default EDID y, x=0~16, y=1~36	s edid in 1 from 1!	input 1 edid: 1080p, stereo audio 2.0	1080p, stereo audio 2.0
r edid in x!	Get EDID status of input x, x=0~16	r edid in 1!	input 1 edid: 1080p, stereo audio 2.0	1080p, stereo audio 2.0
s edid userx yy!	Set user-defined EDID x=1~2, yy=EDID data	s edid user 1 00ffffffffffffff...!	user1 edid setting ok	-
r edid userx!	Get user-defined EDID x=1~2	r edid user 1!	user1 edid data: 0x00, 0xff…	-
r edid data hdmi y!	Get EDID data of TV connected to HDMI output y	r edid data hdmi 1!	edid: 00 ff ff ff ff …	-
r ipconfig!	Get current IP configuration	r ipconfig!	ip mode: dhcp, ip:192.168.0.200, subnet:255.255.255.0, gateway:192.168.0.1, MAC:ff-ff-ff-ff-ff-ff, tcp/ip port=8000, telnet port=23	-
r mac addr!	Get network MAC address	r mac addr!	mac address: ff-ff-ff-ff-ff-ff	-
s ip mode z!	Set network IP mode, z=0 static, 1 DHCP	s ip mode 1!	set ip mode: dhcp (requires s net reboot!)	dhcp
r ip mode!	Get network IP mode	r ip mode!	ip mode:	dhcp

			dhcp	
s ip addr xxx.xxx.xxx.xxx!	Set network IP address	s ip addr 192.168.8.180!	set ip address:192.168.8.180 (requires s net reboot!)	-
r ip addr!	Get network IP address	r ip addr!	ip address:192.168.8.180	-
s subnet xxx.xxx.xxx.xxx!	Set network subnet mask	s subnet 255.255.255.0!	set subnet mask:255.255.255.0 (requires s net reboot!)	255.255.255.0
r subnet!	Get network subnet mask	r subnet!	subnet mask: 255.255.255.0	255.255.255.0
s gateway xxx.xxx.xxx.xxx!	Set network gateway	s gateway 192.168.8.1!	set gateway:192.168.8.1 (requires s net reboot!)	192.168.1.1
r gateway!	Get network gateway	r gateway!	Gateway:192.168.1.1	192.168.1.1
s tcp/ip port x!	Set network TCP/IP port, x=1~65535	s tcp/ip port 8000!	Set tcp/ip port:8000	8000
r tcp/ip port!	Get network TCP/IP port	r tcp/ip port!	tcp/ip port:8000	8000
s telnet port x!	Set network telnet port, x=1~65535	s telnet port 23!	set telnet port:23	23
r telnet port!	Get network telnet port	r telnet port!	telnet port:23	23

Connection Diagram

16x16 as an example



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.

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