BZB GEAR®

Solutions to Amplify Your World™

BG-EXH-4KC7

4K HDMI/USB-C over HDBaseT 3.0

Extender (100m) with USB/1G LAN

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.

Surge Protection Strongly Recommended

This device contains sensitive electronic components that may be vulnerable to damage from electrical spikes, surges, lightning strikes, or power fluctuations. To ensure optimal performance and extend the lifespan of your equipment, we strongly recommend using a quality surge protection system.

Introduction

The BG-EXH-4KC7 HDMI extender is an ideal device for both local and remote viewing purposes. It extends an HDMI signal to an impressive range of up to 40m (132 feet). This makes this unit perfect for point-to-point digital signage applications that demand high-quality HDMI video or in home applications such as extending a game console HDMI connection as this unit supports resolutions of up to 4K@120Hz 4:4:4 with DSC function. Additionally, the extender is designed to extend Infrared (IR) signals from remote controls, enabling convenient control of your video source from your video destination.

Features

- HDCP 2.2 and DisplayPort 1.4a compliant, 18Gbps video bandwidth
- HDBaseT 3.0 design powered by VS3000 chipset
- Supports up to 4K@60Hz (YUV 4:4:4) per HDMI 2.0b
- 4K60/4K30/1080p transmission up to 328ft (100m) via CAT6A/7 (Standard Mode)
- 1080p 8-bit transmission up to 492ft (150m) via CAT6A/7 (Long Reach Mode)
- TX: 1x HDMI in, 1x USB-C in, 1x HDMI/HDBT out, 1x USB 3.2 host, 3x USB 3.2 clients
- RX: 1x HDBT in, 1x HDMI out, 4x USB 2.0 clients
- USB-C and HDMI inputs support auto/manual switching
- Auto switching via HDMI 5V or signal detection
- TX USB-C supports DP-ALT mode, USB 3.2, 1G Ethernet, and 100W charging
- USB-A ports enable VBUS only when host is connected
- Supports HDR, HDR10, HDR10+, Dolby Vision LLM, and HLG pass-through
- 4K to 1080p downscaling (no frame rate conversion) on HDMI output
- Analog audio de-embedding on both TX and RX
- RS-232 pass-through and API control
- RS-232/CEC for external device power control
- 1G Ethernet and bi-directional IR signal pass-through
- Advanced EDID management
- Bi-directional 24V PoC with switch (USB-C charging from TX power supply only)

Packing List

- 1× 4K HDMI/USB-C over HDBaseT 3.0 Extender – Transmitter
- 1× 4K HDMI/USB-C over HDBaseT 3.0 Extender – Receiver
- 2× 3-pin Phoenix Connectors (3.5mm, male)
- 2× 5-pin Phoenix Connectors (3.5mm, male)
- 4× Mounting Ears
- 8× KM3×6 Machine Screws
- 1× IR Blaster Cable (1.5m)
- 1× IR Receiver Cable (1.5m)
- 1× 24V/7.5A Desktop Power Adapter
- 1× User Manual

Specifications

Technical Specifications	
HDMI Compliance	HDMI 2.0b
HDCP Compliance	HDCP 2.2
DisplayPort Compliance	DisplayPort 1.4a
Video Bandwidth	18Gbps
Supported Resolutions	640×480p60, 800×600p60, 1024×768p60, 1280×1024p60, 1360×768p60, 1440×900p/1050p60, 1600×1200p60, 720×480i/p59.94, 720×576i/p50, 1280×720p50/59.94/60, 1920×1080i50/59.94/60, 1920×1080p23.98/24/25/29.97/30/50/59.94/60, 3840×2160p23.98/24/25/29.97/30/50/59.94/60/100/120, 4096×2160p23.98/24/25/29.97/30/50/59.94/60
Color Space	RGB, YCbCr 4:4:4 / 4:2:2, YUV 4:2:0
Color Depth	8/10/12-bit
HDR Support	HDR, HDR10, HDR10+, Dolby Vision, HLG
IR Level	12Vp-p
Audio Formats	**HDMI/USB-C/HDBT**: LPCM 2/5.1/7.1CH, Dolby (Digital/Plus/EX, TrueHD, Atmos), DTS (EX, 96/24, High Res, HD MA), DSD **Analog Audio**: LPCM 2CH (32–192kHz)
Audio Output Parameters	Impedance: 600Ω balanced, 300Ω unbalanced Level: 8.2dBu (2Vrms) balanced, 2.2dBu (1Vrms) unbalanced Freq. Response: 20Hz–20kHz (±0.5dB) Dynamic Range: >90dB @ 0dBu S/N Ratio: >90dB @ 0dBu THD+N: <0.01% @ +4dBu Delay: <1ms
USB Support	**TX**: USB 3.2 Gen 1 (5Gbps), backward compatible with USB 2.0 (480Mbps) **RX**: USB 2.0 (350Mbps)
USB Ports	**TX Host**: 1x USB-C 3.2 Gen 1, 1x USB-B 3.2 Gen 1 **TX Device**: 1x USB-C 3.2 Gen 1, 2x USB-A 3.2 Gen 1 **RX Device**: 1x USB-C 2.0, 3x USB-A 2.0

USB Power Supply	**TX Host**: 1x USB-C (100W charging) **TX Device**: 1x USB-C (1A), 2x USB-A (1.5A) **RX Device**: 1x USB-C (1A), 3x USB-A (1A)
Transmission Distance	HDMI/USB-C cable: 16.4ft (5m) USB 3.2 Gen 1 cable: 5.9ft (1.8m) CAT6A/7: 328ft (100m) @ 4K60 (Standard), 492ft (150m) @ 1080p (Long Reach)
ESD Protection	±8kV (Air), ±4kV (Contact) — IEC 61000-4-2
Transmitter Connections	**Inputs**: 1x HDMI, 1x USB-C **Outputs**: 1x HDBT (PoC), 1x HDMI, 1x AUDIO **Control**: 1x LAN, 1x RS-232, 1x USB-C (Service), 1x USB-B (Host), 1x USB-C + 2x USB-A (Devices), 1x IR IN, 1x IR OUT
Receiver Connections	**Input**: 1x HDBT **Outputs**: 1x HDMI, 1x AUDIO **Control**: 1x LAN, 1x RS-232, 1x USB-C (Service), 1x USB-C + 3x USB-A (Devices), 1x IR IN, 1x IR OUT
Mechanical Specifications	
Housing / Color	Metal Enclosure / Black
Dimensions (W×D×H)	TX/RX: 8.2in × 4.8in × 0.87in / 208mm × 122mm × 22mm
Weight	TX: 1.51 lbs [687g], RX: 1.4 lbs [636g]
Power Supply	Input: AC 100–240V 50/60Hz Output: DC 24V/7.5A (CE/FCC/UL certified)
Power Consumption	Max 173W (with USB-C charging, PoC to RX) Max 73W (without USB-C charging)
Operating Temp	32°F to 104°F / 0°C to 40°C
Storage Temp	-4°F to 140°F / -20°C to 60°C
Operating Humidity	20%–80% (non-condensing)
Storage Humidity	10%–90% (non-condensing)
Recommended HDMI Cable Length	4K60: 16.4ft (5m) 4K24: 33ft (10m) 1080p60: 49ft (15m) **Use Premium High-Speed HDMI cables**

Note: In HDBaseT Long Reach Mode, due to bandwidth limitations, only USB HID devices (such as keyboards and mice) are supported. USB 2.0 devices are not supported in this mode. Additionally, when using the USB pass-through function, the serial baud rate may be limited.

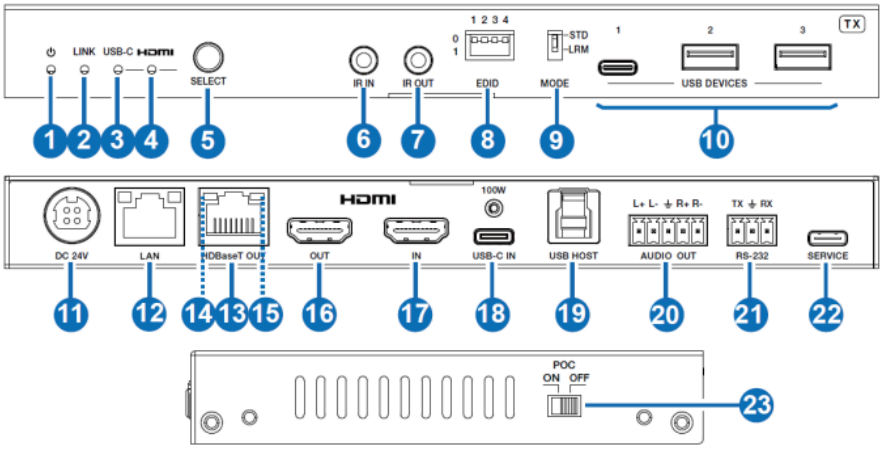
EDID Setting List

DIP Switch	Video Format	Audio Format	Description
0000	**Auto Detect** (Default)	Auto	Automatically selects optimal EDID
0001	HDMI 1080p @ 60Hz	2CH PCM	Standard Full HD with stereo audio
0010	HDMI 4K @ 30Hz, 4:4:4, 8-bit	2CH PCM	4K UHD at 30Hz, 8-bit color, stereo audio
0011	HDMI 4K @ 60Hz, 4:4:4, 8-bit	2CH PCM	Smooth 4K with stereo audio
0100	HDMI 1080p @ 60Hz	5.1CH DTS/Dolby	Full HD with surround sound
0101	HDMI 1080p @ 60Hz	7.1CH DTS/Dolby/HD	Full HD with advanced surround sound
0110	HDMI 4K @ 60Hz, 4:4:4, 8-bit	5.1CH DTS/Dolby	High-quality 4K with surround sound
0111	HDMI 4K @ 60Hz, 4:4:4, 8-bit	7.1CH DTS/Dolby/HD	High-quality 4K with immersive audio

1000	HDMI 1920x1200 @ 60Hz	2CH PCM	WUXGA resolution with stereo audio
1001	DVI 1920x1080 @ 60Hz	None	DVI video only (No audio)
1010	DVI 1920x1200 @ 60Hz	None	Higher res DVI video only (No audio)
1011	**Pass-through (Copy from TX)**	As detected	Copies EDID from HDMI OUT on transmitter
1100	**Pass-through (Copy from RX)**	As detected	Copies EDID from HDMI OUT on receiver
1101	**User Defined 1**	Custom	User-loaded EDID profile 1
1110	**User Defined 2**	Custom	User-loaded EDID profile 2
1111	**Software Controlled**	Software Defined	EDID managed via software interface

Operation Controls and Functions

Transmitter Panels

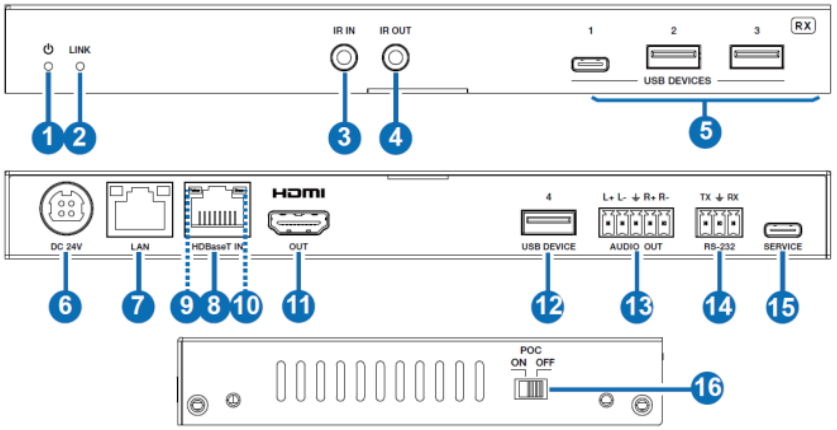


No.	Name	Function Description
1	Power LED (Red)	Indicates the transmitter is powered on.
2	LINK LED (Green)	- On: Good connection between transmitter and receiver- Flashing: Poor connection- Off: No connection
3	USB-C LED (Green)	Lights up when the USB-C IN port is selected as the video input channel.
4	HDMI LED (Green)	Lights up when the HDMI IN port is selected as the video input channel.
5	SELECT Button	Press to switch between HDMI and USB-C video input.
6	IR IN	IR signal input port; connect to IR receiver cable.
7	IR OUT	IR signal output port; connect to IR blaster cable.
8	EDID DIP Switch	Used for EDID configuration. Refer to the EDID setting list. Note: Only when the switch is set to 1111 can EDID be set via API commands.

9	MODE Switch	Switches HDBaseT operating mode:- STD (Standard Mode): Default; supports up to 4K60 over 100m (CAT6A/7)- LRM (Long Reach Mode): Supports up to 1080p 8-bit over 150m (CAT6A/7)
10	USB Device Ports	Three USB 3.2 device ports (2× USB-A, 1× USB-C) for connecting peripherals such as keyboard, mouse, or flash drives.
11	DC 24V Power Input	Input for 24V/7.5A power adapter. Note: Supports PoC (Power over Cable); only one of TX/RX needs to be powered.
12	LAN Port	1G Ethernet pass-through:- Yellow LED: Flashes at 1000Mbps- Green LED: Flashes at 100Mbps
13	HDBaseT OUT	Connects to HDBaseT IN on the receiver via CAT6A/7 cable. Carries HDMI, Ethernet, and USB signals.
14	Data Signal Indicator (Yellow)	- On: Video signal with HDCP encryption- Flashing: Video signal without HDCP- Off: No video signal transmission
15	Link Signal Indicator (Green)	Same functionality as LINK LED (see item #2).
16	HDMI OUT	HDMI loop-out port for local video display.
17	HDMI IN	HDMI video input port for the source device.
18	USB-C IN	USB Type-C port with 4 functions: - Video signal input - USB 3.2 Gen 1 data transmission (when selected) - 100W charging (only when TX is powered) - 1G Ethernet access
19	USB HOST	USB 3.2 Gen 1 host port; connect to PC.
20	AUDIO OUT	Analog audio output port: - Balanced: L+, L–, GND, R+, R– (up to 2Vrms) - Unbalanced: L+, GND, R+ (up to 1Vrms)
21	RS-232	Serial port for signal pass-through and API control.

22	SERVICE Port	USB 2.0 Type-C port used for firmware updates and API control.
23	PoC Switch	Enables or disables 24V Power over Cable: - ON (default): PoC enabled - OFF: Local 24V power supply required

Receiver Panels

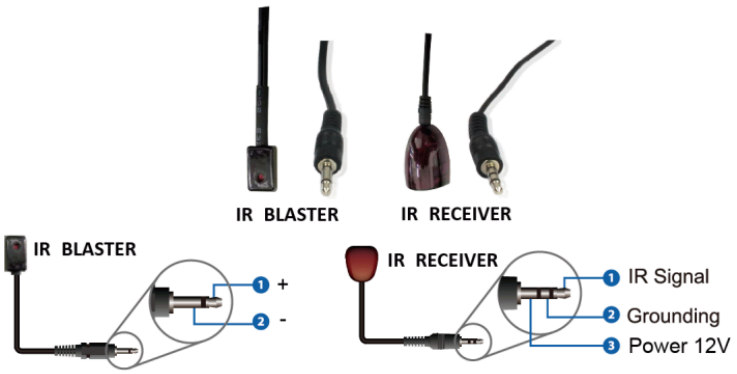


No.	Name	Function Description
1	**Power LED**	Red LED indicates the receiver is powered on.
2	**LINK LED (Green)**	**On:** Good connection between transmitter and receiver. **Flashing:** Poor connection. **Off:** No connection.
3	**IR IN**	IR signal input port, connect to IR receiver cable.
4	**IR OUT**	IR signal output port, connect to IR blaster cable.
5	**USB Device Ports**	Three USB 2.0 ports (2 × USB-A, 1 × USB-C), for mouse, keyboard, flash drive, or other USB devices.
6	**DC 24V Input**	24V/7.5A DC power supply input. Supports **PoC** (Power over Cable): Only one unit (transmitter or receiver) requires power.

7	**LAN Port**	1G Ethernet pass-through. **Yellow LED:** 1000Mbps. **Green LED:** 100Mbps.
8	**HDBaseT IN**	Connects to HDBaseT OUT on the transmitter via CAT6A/7 cable. Transfers HDMI, network, and USB signals.
9	**Data Signal Indicator (Yellow)**	**On:** Video signal with HDCP encryption. **Flashing:** Video signal without HDCP. **Off:** No video signal.
10	**Link Signal Indicator (Green)**	Same status as LINK LED: **On:** Good connection. **Flashing:** Poor connection. **Off:** Not connected.
11	**HDMI OUT**	HDMI signal output, connect to TV, monitor, or other HDMI display device.
12	**USB DEVICE**	USB 2.0 port for connecting mouse, keyboard, flash drive, or other USB device.
13	**AUDIO OUT**	Analog audio output supporting: - **Balanced**: L+, L-, GND, R+, R- (up to 2Vrms) - **Unbalanced**: L+, GND, R+ (up to 1Vrms)
14	**RS-232**	RS-232 serial port for signal pass-through and API command control.
15	**SERVICE Port**	USB 2.0 Type-C port used for firmware updates and API command access.
16	**PoC Switch**	24V PoC (Power over Cable) toggle switch: **ON:** PoC enabled (default). **OFF:** PoC disabled—requires local DC power.

IR Pin Definition

The definitions for the IR Receiver and Blaster pins are provided below:



Note:

- When the angle between the IR receiver and the remote control is within ±45°, the effective transmission range is 0–5 meters.
- When the angle is within ±90°, the range extends up to 0–8 meters.

API Command Control

This product supports control via API commands for flexible integration with external systems. To get started, connect the product to a PC or control system using one of the following methods:

- **RS-232 Control**: Use a 3-pin Phoenix connector cable to connect the product's RS-232 port to your PC or control system.
- **USB-C Control**: Use a USB-C cable to connect the product's SERVICE port directly to a PC.

Once connected, launch a serial command tool on your PC and send ASCII commands to control the device. A complete list of supported ASCII commands is provided below.

ASCII Commands Reference Table

Interface	Description	Baud Rate	Data Bit	Stop Bit	Parity
USB-C (Service Port)	Virtual RS-232 for internal debugging (command line)	115200 (Fixed)	8	1	None
Phoenix RS-232	For external control systems	2400~115200 (Configurable)	8	1	None

Command List

Command Code	Description	Example	Feedback	Default
? / help	List all available commands	? or help	List all commands	–

get fw version	Get firmware versions	get fw version	TX FW v1.00.00 RX FW v1.00.00	–
set reboot	Reboot the device	set reboot	Rebooting... Initializing... Done	–
set reset	Factory reset	set reset	Prompt to confirm with “Yes”	–
get status	Get system status	get status	Returns system info	–

Front Panel Key Control

Command Code	Description	Example	Feedback	Default
set tx key on/off	Enable/disable TX front panel key	set tx key on	Set TX key on	On
get tx key	Get TX front panel key status	get tx key	On or Off	On

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Network Access (USB-C)

Command Code	Description	Example	Feedback	Default
set tx Usbc AccessNetwork on/off	Enable/disable USB-C network access	set tx Usbc AccessNetwork on	Set TX USB-C access network on	On

get tx Usbc AccessNetwork	Get USB-C network access status	get tx Usbc AccessNetwork	On or Off	On

Source Selection

Command Code	Description	Example	Feedback	Default
set tx source x	Set input source (0~4) x=0: Off, 1: USB-C, 2: HDMI, 3: AVMute, 4: Pattern	set tx source 1	Set TX source to USB-C	1
get tx source	Get current input source	get tx source	USB-C, HDMI, etc.	–

Internal Pattern Generator

Command Code	Description	Example	Feedback	Default
set tx pattern x y	Set resolution and pattern x=16 (resolutions), y=112 (patterns)	set tx pattern 1 2	Set TX pattern 4K60Hz checkboard	–
get tx pattern	Get current pattern generator setting	get tx pattern	TX pattern 4K60Hz checkboard	–

HDCP Settings

Command Code	Description	Example	Feedback	Default
set tx input x hdcp y	Set HDCP on input (x=0~2), y=0: Off, 1: 1.4, 2: 2.2	set tx input 0 hdcp 2	TX all inputs HDCP 2.2	HDCP 2.2
get tx input x hdcp	Get HDCP status of inputs	get tx input 0 hdcp	Status per input	–
set tx output x hdcp y	Set HDCP on output (x=02), y=03 modes	set tx output 2 hdcp 1	Set TX HDMI output HDCP auto	Auto
get tx output x hdcp	Get HDCP status of outputs	get tx output 0 hdcp	HDCP status per output	–

USB Configuration

Command Code	Description	Example	Feedback	Default
set tx usb x	Set USB source: 0=Follow video, 1=USB-C, 2=USB-B	set tx usb 0	Set USB source to follow video	0
get tx usb	Get current USB source	get tx usb	Follow video, USB-C, etc.	–

get tx usbh5v x	Get USB host input 5V status	get tx usbh5v 0	Power status of USB inputs	–
set tx usbd5v x to y	Set USB device 5V output (03), y=02	set tx usbd5v 0 to 1	Follow host, etc.	1
get tx usbd5v x	Get USB device 5V output status	get tx usbd5v 0	Status per port	–

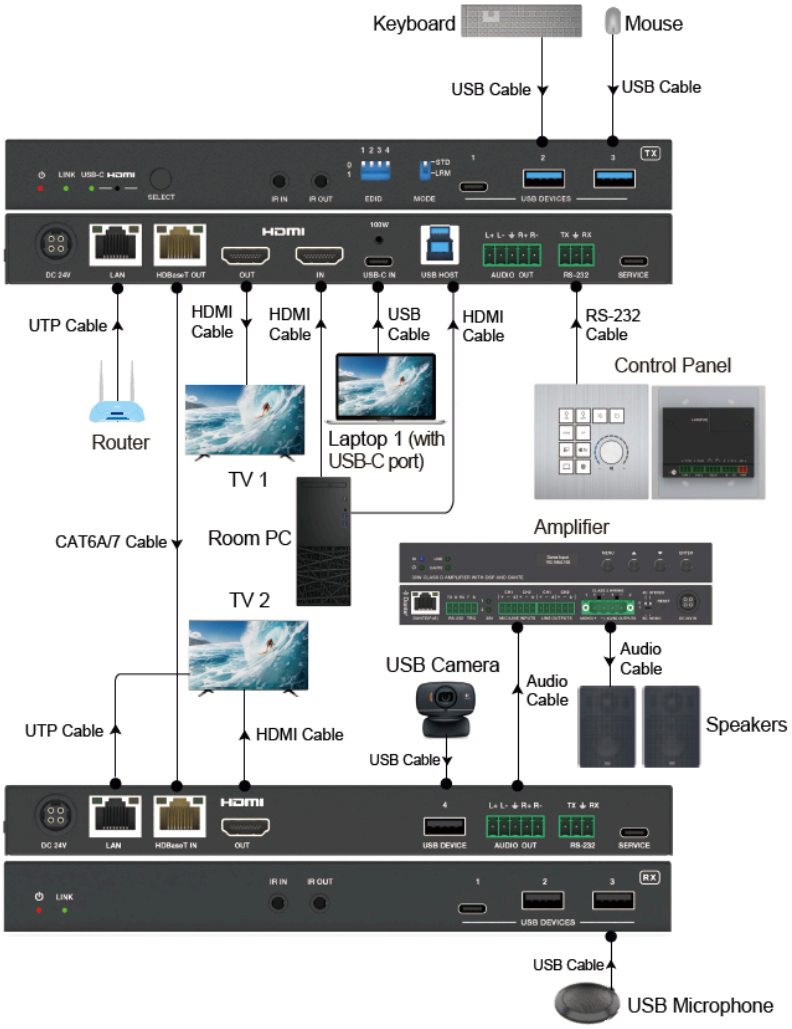
Auto-Switching

Command Code	Description	Example	Feedback	Default
set tx autoswitch on/off	Enable/disable auto-switching	set tx autoswitch on	Set TX autoswitch on	On
get tx autoswitch	Get auto-switching status	get tx autoswitch	On or Off	On
set tx autoswitch mode x	Set mode: 0=5V detection, 1=Signal detection	set tx autoswitch mode 1	Signal detection	Signal detection
get tx autoswitch mode	Get current auto-switching mode	get tx autoswitch mode	Signal detection, etc.	–

EDID Management

Command Code	Description	Example	Feedback	Default
set tx edid x to y	Assign EDID to input (x=02), preset (y=119)	set tx edid 0 to 1	Set EDID to HDMI 1080p@60Hz, 2CH	1
get tx edid x	Get current EDID of input	get tx edid 0	EDID info per port	–
get tx edid data x	Get raw EDID data from input	get tx edid data 1	Hexadecimal data or block	–

Connection Diagram



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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