



BG-EXH-4KFE

4K 18Gbps HDMI 2.0 Fiber Extender Kit up to 10 km with Included SFP+ Modules and USB KVM/Bi-Directional IR/RS-232 and Audio De-Embedding Support

User Manual

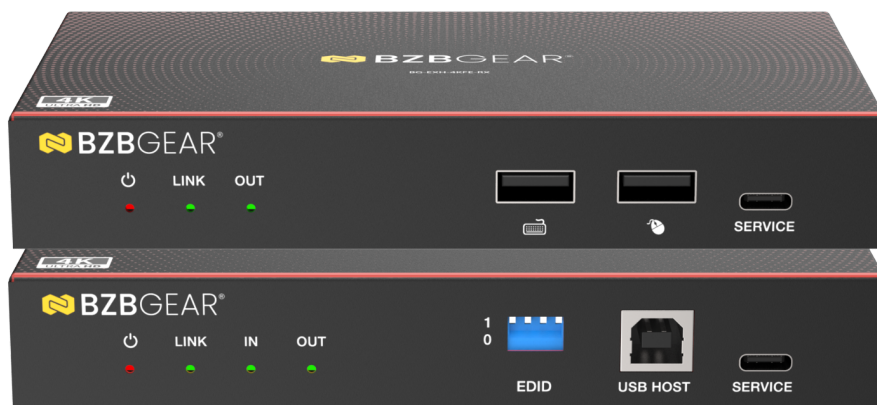






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Statement

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-EXH-4KFE is a high-performance HDMI™ over fiber extender designed to transmit uncompressed 4K Ultra HD video signals over long distances with exceptional stability and signal integrity. Supporting up to 18Gbps bandwidth and HDMI 2.0b/HDCP 2.2 compliance, it delivers resolutions up to 4K@60Hz 4:4:4 with full HDR support, making it suitable for demanding professional AV environments. Using single-mode fiber, the system can extend signals up to 10km, while optional multi-mode fiber support (OM4) enables distances up to 300m via SFP modules.

In addition to video transmission, the BG-EXH-4KFE integrates comprehensive control and signal management features including bi-directional IR and RS-232 pass-through, USB 1.1 keyboard and mouse extension, and advanced EDID management for flexible system compatibility. The transmitter includes a loop-through HDMI output for local monitoring, while the receiver supports audio de-embedding for standalone audio routing. With its compact metal housing, strong anti-interference design, and robust long-distance transmission capability, this extender is ideal for control rooms, broadcast systems, digital signage, and large-scale commercial installations.

Features

- **18Gbps HDMI 2.0b Transmission:** Supports high-bandwidth 18Gbps video signals for uncompressed 4K Ultra HD performance up to 4K@60Hz 4:4:4.
- **Ultra-Long Distance Fiber Extension:** Transmits HDMI™ signals up to 10km over single-mode fiber cable, ensuring reliable long-range AV distribution.
- **Multi-Mode Fiber Compatibility:** Supports OM4 multi-mode fiber transmission up to 300m using SFP modules for flexible deployment options.
- **HDCP 2.2 & HDMI™ 2.0b Compliance:** Fully compatible with modern protected content sources and displays for seamless integration.
- **Full HDR & Advanced Color Support:** Passes HDR10, HDR10+, Dolby Vision, and HLG with deep color up to 12-bit for enhanced image quality.
- **Advanced Audio Format Support:** Handles LPCM up to 7.1CH and major Dolby/DTS formats including Dolby TrueHD and DTS-HD Master Audio.
- **Bi-directional IR Control:** Enables remote control of source or display devices from either end of the system for flexible operation.
- **RS-232 Pass-Through Control:** Supports serial command transmission for integration with third-party control systems.
- **USB KVM Extension (Keyboard/Mouse):** Extends USB 1.1 signals for remote keyboard and mouse control functionality.
- **HDMI Loop-Out on Transmitter:** Provides local monitoring of the source signal directly from the transmitter unit.
- **Audio De-Embedding on Receiver:** Extracts analog audio from HDMI signal for external audio system integration.



- **Advanced EDID Management:** Ensures optimal compatibility between source and display devices with selectable EDID modes.
- **Compact Metal Housing Design:** Durable, lightweight enclosure for professional rack or surface-mounted installations.
- **Low Power & High Stability Operation:** Efficient 5V power design with strong anti-interference and stable long-distance transmission performance.

Packing List

- 1× 18Gbps HDMI™ over Fiber Extender (Transmitter)
- 1× 18Gbps HDMI™ over Fiber Extender (Receiver)
- 2× 5V/2A Multinational Locking Power Supplies
- 1× USB Cable (Type A to Type B, 1.5m)
- 1× IR Blaster Cable (1.5m)
- 1× IR Wideband Receiver Cable (1.5m)
- 3× 3-pin 3.5mm Phoenix Connectors (Male)
- 4× Mounting Ears
- 8× Machine Screws (KM3×4)
- 1× User Manual



Specifications

TECHNICAL	
HDMI™ Compliance	HDMI™ 2.0b
HDCP Compliance	HDCP 2.2
Video Bandwidth	18Gbps
Video Resolution (Max)	Up to 4K@60Hz (3840×2160), 4:4:4
Supported Resolutions	4K@60/50Hz, 4K@30/25Hz, 1080p@60/50Hz, 1920×1200, 1360×768, 1280×720, 1024×768
Color Space	RGB, YCbCr 4:4:4 / 4:2:2 / 4:2:0
Color Depth	8/10/12-bit
HDR Support	HDR10, HDR10+, Dolby Vision, HLG
Audio Formats	LPCM 2/5.1/7.1CH, Dolby Digital/Plus/EX, Dolby TrueHD, DTS, DTS-EX, DTS-96/24, DTS-HD Master Audio, DSD
Fiber Type	10G SFP+ module
Transmission Distance	Up to 10km (single-mode fiber), up to 300m (OM4 multi-mode)
IR Level	5Vp-p
IR Frequency	20K–60KHz (wideband)
ESD Protection	IEC 61000-4-2: ±8kV air, ±4kV contact
CONNECTIONS	
Transmitter Inputs	1× HDMI IN, 1× IR IN (3.5mm), 1× USB-B (HOST), 1× RS-232 (3-pin phoenix)
Transmitter Outputs	1× HDMI OUT (loop out), 1× IR OUT, 1× LC Fiber OUT
Transmitter Control	1× USB-C (service/firmware)
Receiver Inputs	1× LC Fiber IN, 1× IR IN
Receiver Outputs	1× HDMI OUT, 1× IR OUT, 1× AUDIO OUT (3-pin phoenix)
Receiver USB	2× USB-A (keyboard & mouse)
Receiver Control	1× RS-232 (3-pin phoenix), 1× USB-C (service)



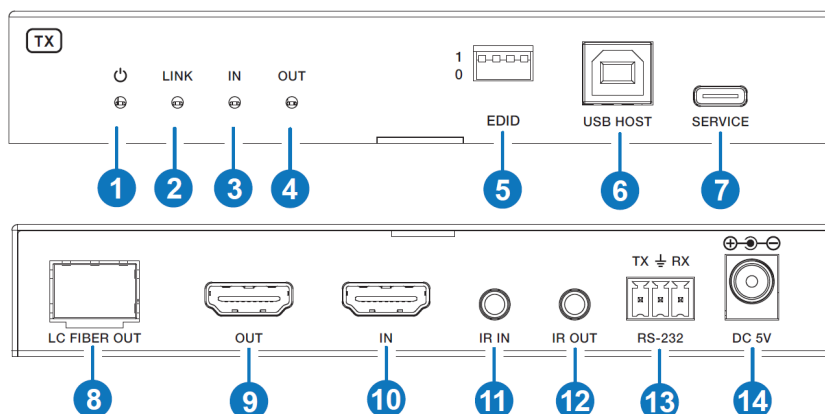
MECHANICAL	
Housing	Metal enclosure
Color	Black
Dimensions (W × D × H)	5.7in × 3.1in × 0.91in [144mm × 78mm × 23mm] (TX/RX)
Weight	TX: 0.74lb [337g] / RX: 0.73lb [330g]
Power Supply	5V/2A locking power adapter (AC 100–240V, 50/60Hz)
Power Consumption	TX: 5W max / RX: 5W max
Operating Temperature	32°F to 104°F / 0°C to 40°C
Storage Temperature	-4°F to 140°F / -20°C to 60°C
Operating Humidity	20%–80% RH (non-condensing)
Storage Humidity	10%–90% RH (non-condensing)



Operation Controls and Functions

Front and Rear Panel

Transmitter Panel



No.	Name	Function Description
1	POWER LED	Red LED illuminates when the transmitter is powered on.
2	LINK LED	Green LED stays on when a stable fiber link is established between TX and RX.
3	IN LED	Green LED indicates an active HDMI input signal is detected.
4	OUT LED	Green LED indicates an HDMI display device is connected to the loop-out port.
5	EDID DIP Switch	Used for selecting EDID mode (copy RX/TX EDID or predefined HDR/SDR resolutions and audio formats).
6	USB HOST	USB Type-B port used to connect the transmitter to a host PC for USB KVM function.
7	SERVICE	USB-C port for firmware updates and service use.
8	LC FIBER OUT	Fiber optic LC output port connected to the receiver's LC FIBER IN port.
9	HDMI OUT	HDMI loop-out port for local display connection or monitoring.
10	HDMI IN	HDMI input port for source devices such as PC, Blu-ray player, or media device.
11	IR IN	3.5mm IR receiver input for remote control signal reception.
12	IR OUT	3.5mm IR blaster output for transmitting IR control signals.



13	RS-232	3-pin phoenix connector for serial pass-through control between TX and RX.
14	DC 5V	5V/2A locking power input connector.

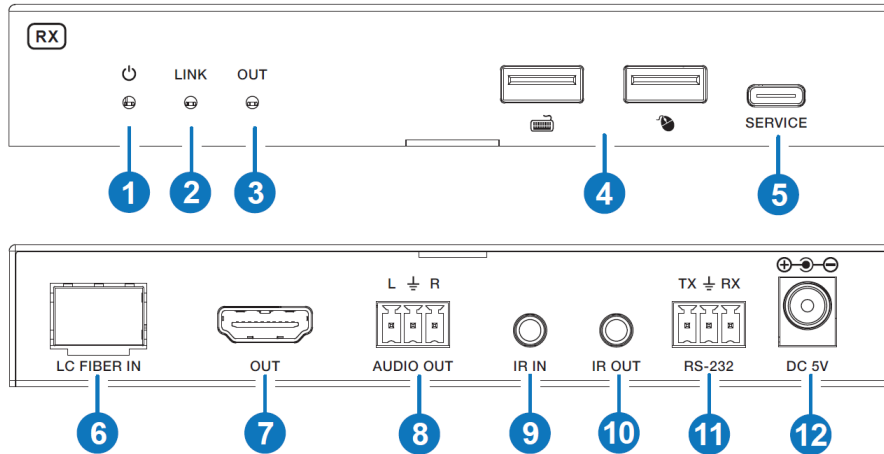
EDID DIP Switch Configurations (Transmitter)

The EDID DIP switch on the transmitter allows selection of predefined EDID profiles or pass-through EDID modes for optimal compatibility between source and display devices.

DIP Setting	EDID Mode	Video / Audio Configuration
1111	Copy RX HDMI OUT EDID	Reads EDID directly from receiver display device
1110	Copy TX HDMI OUT EDID	Reads EDID from local loop-out display on transmitter
1101	4K60 (4:4:4) HDR	4K@60Hz 4:4:4 + HDR, PCM 2.0CH
1100	4K60 (4:4:4) HDR	4K@60Hz 4:4:4 + HDR, PCM 5.1CH
1011	4K60 (4:4:4) HDR	4K@60Hz 4:4:4 + HDR, PCM 7.1CH
1010	4K60 (4:4:4) SDR	4K@60Hz 4:4:4 + SDR, PCM 2.0CH
1001	4K60 (4:4:4) SDR	4K@60Hz 4:4:4 + SDR, PCM 5.1CH
1000	4K60 (4:4:4) SDR	4K@60Hz 4:4:4 + SDR, PCM 7.1CH
0111	1080p60 HDR	1080p@60Hz + HDR, PCM 2.0CH
0110	1080p60 HDR	1080p@60Hz + HDR, PCM 5.1CH
0101	1080p60 HDR	1080p@60Hz + HDR, PCM 7.1CH
0100	1080p60 SDR	1080p@60Hz + SDR, PCM 2.0CH
0011	1080p60 SDR	1080p@60Hz + SDR, PCM 5.1CH
0010	1080p60 SDR	1080p@60Hz + SDR, PCM 7.1CH
0001	1920×1200 SDR	1920×1200 + SDR, PCM 2.0CH
0000	User Defined EDID (Default)	Custom EDID loaded via SERVICE port (factory default: 1080p60 SDR, 2.0CH)



Receiver Panel

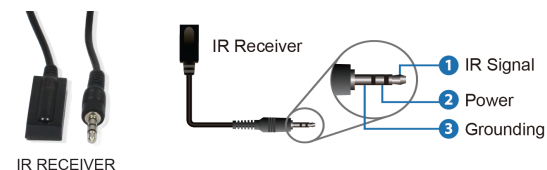
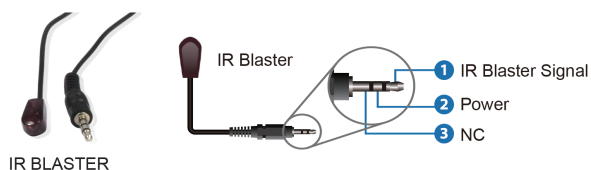


No.	Name	Function Description
1	POWER LED	Red LED illuminates when the receiver is powered on.
2	LINK LED	Green LED stays on when a stable fiber link is established between TX and RX.
3	OUT LED	Green LED indicates an active HDMI display connection.
4	USB (Keyboard & Mouse)	USB-A ports for connecting keyboard and mouse for KVM extension.
5	SERVICE	USB-C port for firmware updates and service use.
6	LC FIBER IN	Fiber optic LC input port connected to the transmitter's LC FIBER OUT port.
7	HDMI OUT	HDMI output port for connection to display devices such as TVs or monitors.
8	AUDIO OUT	Analog audio de-embedding output (L / GND / R) for external audio systems.
9	IR IN	3.5mm IR receiver input for remote control signal reception.
10	IR OUT	3.5mm IR blaster output for transmitting IR control signals.
11	RS-232	3-pin phoenix connector for serial pass-through control between TX and RX.
12	DC 5V	5V/2A locking power input connector.



IR Pin Definition

The IR receiver and IR blaster cables use a standard 3.5mm connector with the following pin configuration:



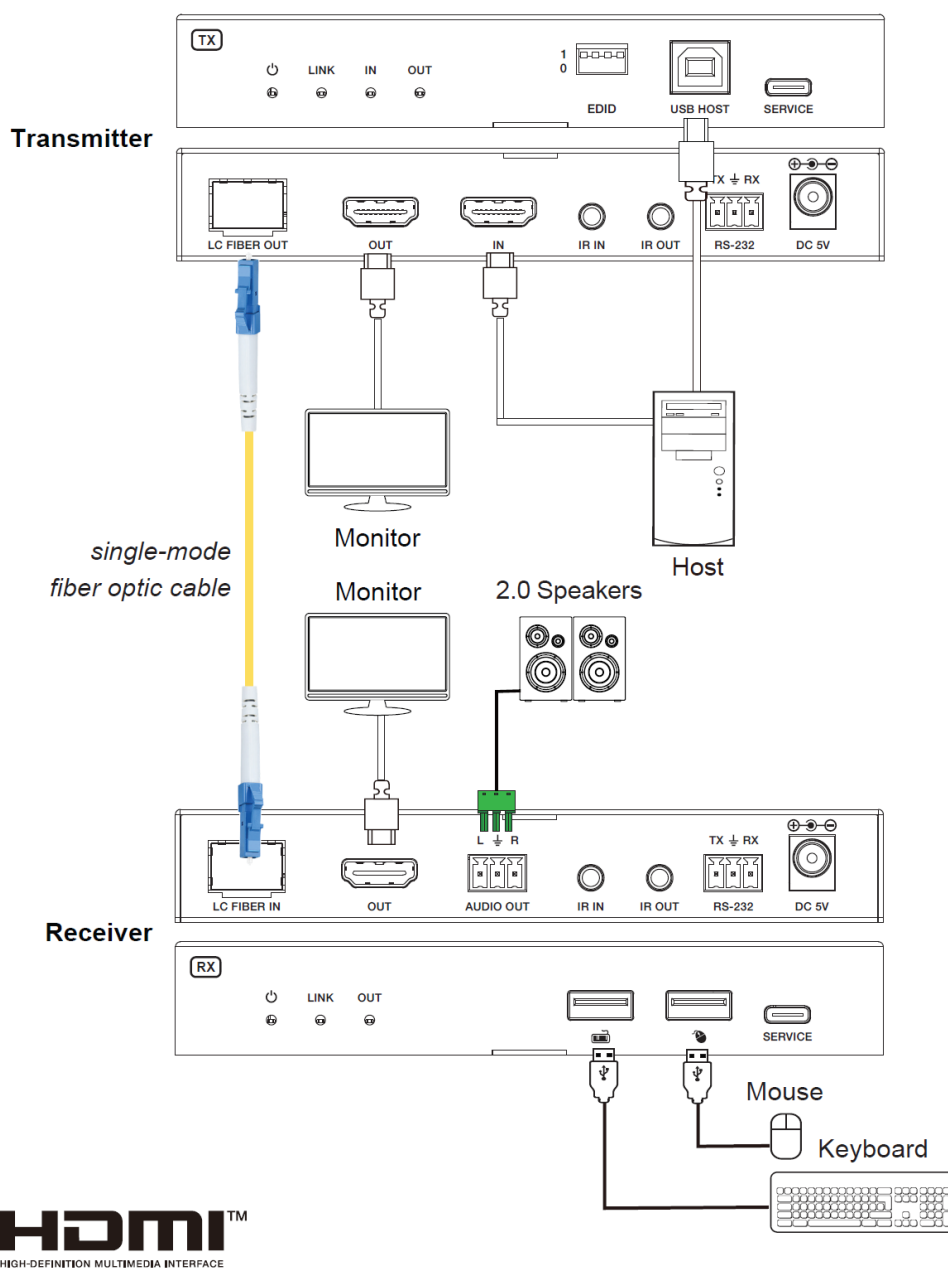
Pin	Signal	Description
Tip	IR Signal	Infrared signal input/output
Ring	VCC (5V)	Power for IR module
Sleeve	Ground (GND)	Signal ground reference

IR Operation Notes

- When the IR receiver and remote control are within $\pm 45^\circ$, the effective transmission distance is approximately **0–5 meters**.
- When the IR receiver and remote control are within $\pm 90^\circ$, the effective transmission distance is approximately **0–8 meters**.



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

1.888.499.9906

Email

support@bzbgear.com

Live Chat

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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