# BG-IPGEAR-LITE

HDMI 2.1 Over IP Multicast System with Bi-directional IR, RS-232 & USB 3.1 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-IPGEAR-LITE is a high-performance HDMI 2.1 over IP multicast system designed to deliver Ultra-HD 4K@120Hz 4:4:4 video over a Cat.5e network up to 100 meters (330 feet). With support for bi-directional IR, RS-232, and USB 3.1, this versatile solution ensures seamless transmission of high-resolution video and audio while maintaining compatibility with modern AV control systems.
This system is ideal for a variety of applications, including digital signage, healthcare, corporate AV, gaming, and large-scale video broadcasting. The BG-IPGEAR-LITE supports flexible point-to-point, point-to-multipoint, and multicast configurations, enabling scalable video distribution across multiple displays.

## Features

- HDMI 2.1 & HDCP 2.3 Compliance – Ensures compatibility with the latest high-definition content protection standards.
- 4K@120Hz 4:4:4 Video Transmission – Provides ultra-high-definition video with crystal-clear clarity and exceptional color depth.
- VRR (Variable Refresh Rate) & ALLM (Auto Low Latency Mode) – Enhances gaming and interactive applications with smooth frame rates and reduced latency.
- Long-Distance Transmission – Extends HDMI signals up to 100m (330ft) over Cat.5e cabling.
- Advanced Audio Support – Delivers uncompressed 7.1-channel digital HDMI audio, including DTS-HD Master Audio and Dolby TrueHD.
- Intelligent Network Management – Works with managed 1GbE switches supporting IGMP Snooping & 802.1Q VLAN for multicast optimization.
- HDCP & CEC Bypass – Maintains compatibility with a wide range of devices.
- Bi-Directional IR & RS-232 Control – Enables seamless integration with AV control systems.
- eARC/ARC Support – Ensures high-quality audio return from displays.
- Seamless Switching & Video Scaling – Provides smooth transitions between sources and adaptable display resolution.
- Picture-in-Picture (PiP), Picture-by-Picture (PbP), and Picture-on-Picture (PoP) Support – Enhances video collaboration and multi-view functionality.
- USB 3.1 Gen1 & Gen2 Support – Facilitates connectivity for UVC webcams and other USB peripherals.
- 1G LAN Integration – Allows network device connection through the built-in Ethernet port.
- Multi-Encode & Decode Capability – Utilizes proprietary codecs for optimized video streaming.
- Low Latency (<1 frame) – Ensures real-time performance for critical applications.

## Packing List

- 1x BG-IPGEAR-LITE [TX & RX]
- 1x IR Blaster
- 1x IR Receiver
- 2x DC 12V
- 1x User Manual
- 2x 3-pin Power Terminal Block Connector

## Specifications

| Technical | | |
|---|---|---|
| Role of Usage | **Transmitter (TX)** | **Receiver (RX)** |
| HDMI Compliance | HDMI 2.1 | |
| HDCP Compliance | HDCP 2.3 | |
| Video Bandwidth | Up to FRL 5 (40G) | |
| Video Support | Up to 4K@120Hz 4:4:4 | |
| HDMI over UTP | 4K@120 4:4:4 100m (330ft) [CAT.5E] | |
| Audio Support | Surround sound [up to 7.1ch) | |
| Equalization | Auto | |
| Input TMDS Signal | 1.2 Volts [peak-to-peak] | |
| Input DDC Signal | 5 Volts [peak-to-peak, TTL] | |
| ESD Protection | Human body model — ±15kV [air-gap discharge] & ±8kV [contact discharge] | |
| PCB Stack-Up | 6-layer board [impedance control — differential 100Ω; single 50Ω] | |
| IR Pass-Through | Bi-directional | |
| RS-232 Support | Yes | |
| Input | 1x HDMI, 1x 3.5mm, 1x USB, 1x USB-C | 1x 3.5mm, 1x USB, 1x USB-C, 1x RJ-45 |
| Output | 1x 3.5mm, 1x RJ-45 | 1x HDMI, 1x 3.5mm |
| I/O | 1x terminal block(RS-232) | 1x terminal block(RS-232) |
| HDMI Source Control | Controllable via IR pass-through from RX to TX or TX to RX with IR extenders | |
| HDMI Connector | Type A [19-pin female] | |
| RJ-45 Connector | WE/SS 8P8C(Reverse Mode) | |
| USB Connector | Type A/ USB-C | |
| 3.5mm Connector | IR receiver / IR blaster | IR receiver / IR blaster |
| Mechanical | | |
| Housing | Metal enclosure | |
| Mounting | Wall-mounting case with screws | |

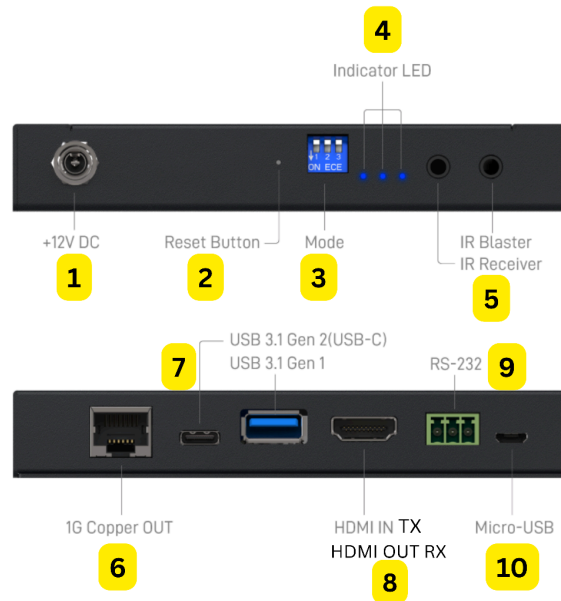| Power Supply | 12V DC |
|---|---|
| Operation Temperature | 0~40°C / 32~104°F |
| Storage Temperature | -20~60°C / -4~140°F |
| Relative Humidity | 20~90% RH [no condensation] |

# Operation Controls and Functions

## Front and Rear Panel



1. **+12V DC**: Interlocking power jack for a 12V DC power supply.
2. **Reset Button**: Factory reset function.
3. **Mode**: Select USB host/device mode or firmware update mode.
4. **Indicator LEDs**: Power and link status indicators.
5. **IR Ports**: 3.5mm sockets for IR receiver and IR blaster extension cables.
6. **1G Copper OUT**: Connect a Cat.5e cable to link with the other unit.
7. **USB 3.1 Ports**: USB-C (Gen 2) for PC connection; USB-A (Gen 1) for USB devices.
8. **HDMI IN/OUT**: Connect an HDMI source to the TX via the HDMI input. Connect an output device to the RX using the HDMI output.
9. **RS-232 (Terminal Block)**: TX, RX, and GND pins (left to right).
10. **Micro-USB**: Debug port.

# IR Pass-Through

## [IR Extenders]

**IR Blaster**                                    **IR Receiver**
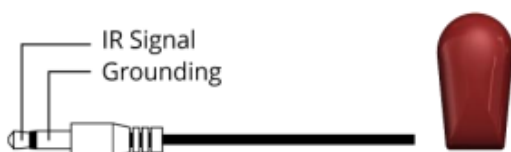
**IR Sockets**

- **IR Blaster:** Connect the IR blaster to transmit IR command signals received from the IR receiver, allowing control of compatible devices.

- **IR Receiver:** Connect the IR receiver to capture IR signals from remote controls, enabling communication with corresponding devices.
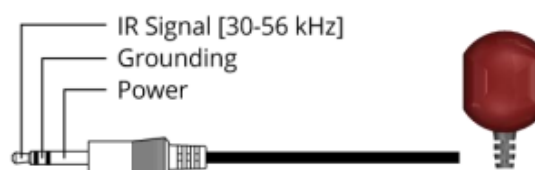
**CAULION!** ➡ Incorrect placement of IR Blaster and Receiver may result in the failure of the IR extenders. Please check carefully before plugging in the IR extender to the respective IR sockets. Warranty will not cover the damage.

## [Definition of IR Earphone Jack]

**IR Blaster**                                    **IR Receiver**

IR Signal                                          IR Signal [30-56 kHz]
Grounding                                          Grounding
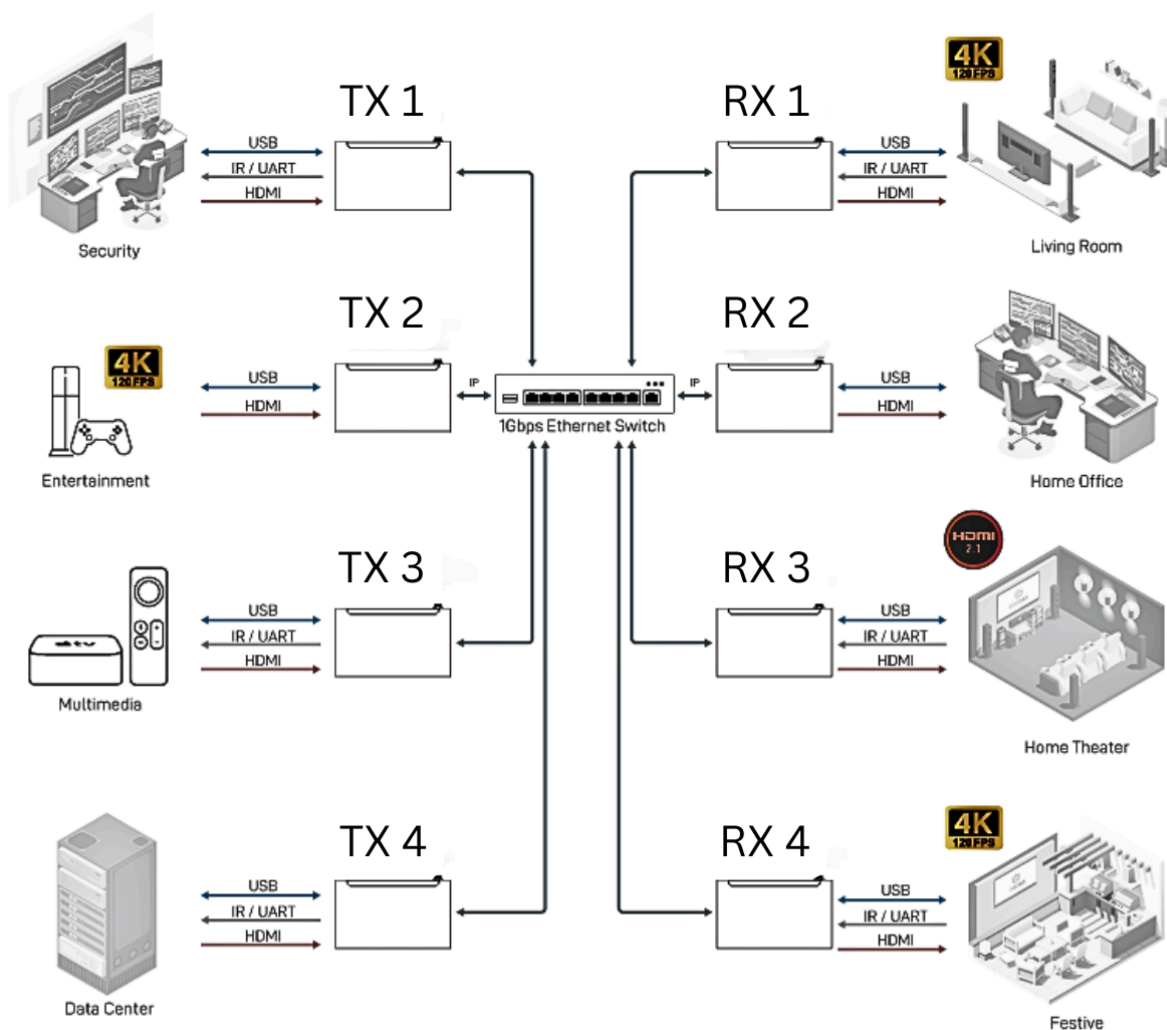                                                   Power

You can buy any IR extension cables in the market that are compatible to the definition of the IR sockets for the extender if necessary for replacement use. However, IR cables longer than 2m (6-ft) may not work.
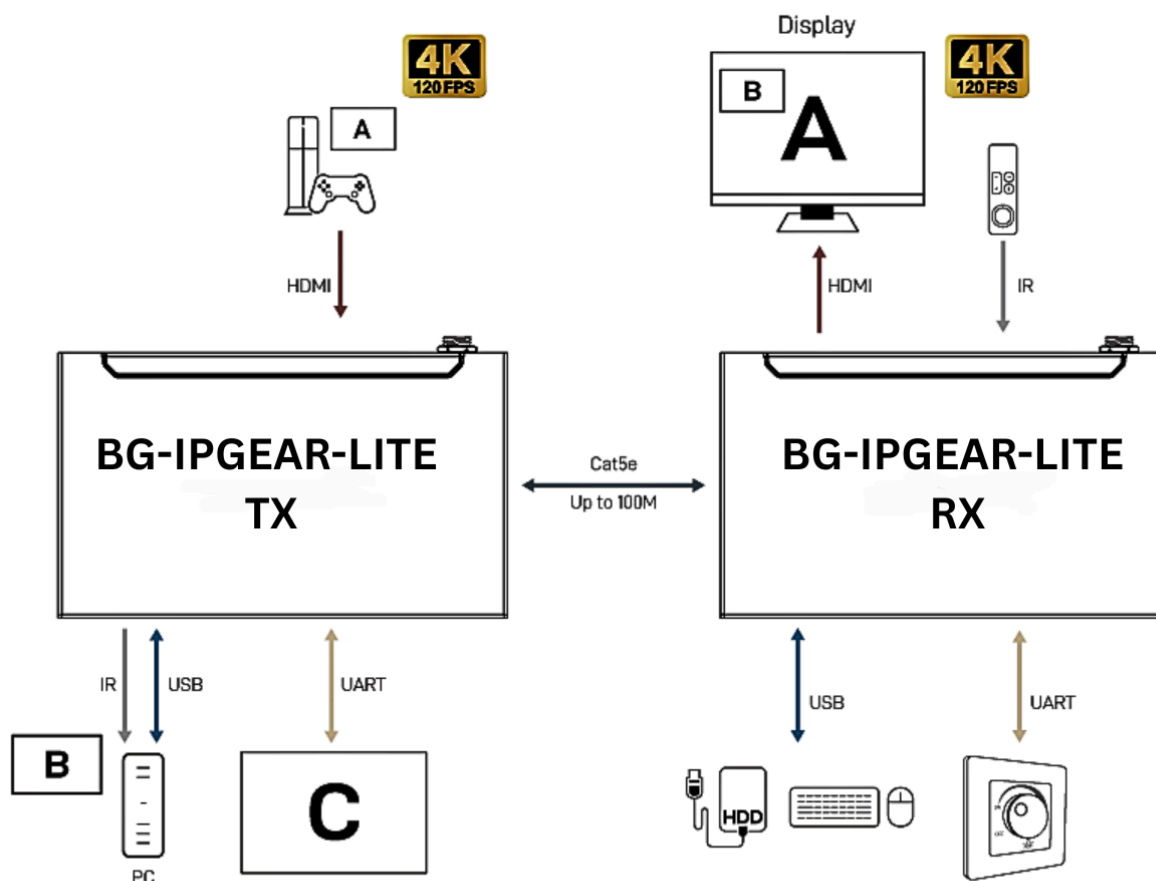
## Connection Diagram 1



Media Distribution

## Connection Diagram 2

**HDMI 2.1 Extender**

## Product Dimensions

TX                                    RX

## 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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