# BZB**2**GEAR®

*Solutions to Amplify Your World™*

# BG-FES12G

**4K/1080P 12G/6G/3G/HD/SD-SDI Extender over Single Mode**

**SFP-Type Fiber Optic**

# 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 Precautions

- 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.

- Unplug this device during lightning storms

- Clean only with a soft dry microfiber cloth.

- 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.

- Only use accessories specified by the manufacture

- Product specifications may be subject to technical upgrades without further notice

## Introduction

The BG-FES12G is a 12G/6G/3G/HD/SD-SDI SFP single mode fiber optic extender that is an economical solution. It is designed for transmission of multi-rate SDI video with embedded audio and metadata over single-mode fiber optic cables. The transmitter module receives one 12G/6G/3G/HD/SDI electrical input, perfectly converts SMPTE 292M, SMPTE 259M, SMPTE 424M, SMPTE 2082 or DVBASI electrical SDI signal to single-mode optical SDI signals. The receiver module receives the optical signal and then converts it to an electrical SDI signal. BG-FES12G is immune to pathological patterns (SMPTE RP-198) and does not introduce any flickering. This feature further guarantees the transmission quality over optical fiber.

Both transmitter and receiver provide equalizing and reclocking at the input unit in order to reconstruct the signal for consistent quality. The BG-FES12G is perfect for broadcasting applications including video production, video editing, studio-to-studio, and studio-to-CATV headends. In addition, since transmission of content is inherently secure and immune to outside interference, fiber applications are favored in government, military, and medical environments.

## Features

- Enable transmission of digital video signal over optical fiber*
  - up to 10 km (6.25 miles)
- Standard SFP-type fiber optic connector
- Supports the following protocols:
  - SMPTE 259M (270Mbps)
  - SMPTE 259M (360Mbps)
  - SMPTE 292M / HDTV (1.485Gbps and 1.485/1.001Gbps)
  - SMPTE 424M / HDTV (2.97Gbps and 2.97/1.001Gbps)
  - SMPTE 2082-1 / HDTV (5.94Gbps and 5.94/1.001Gbps)
  - SMPTE 2082-2 / HDTV (11.88Gbps and 11.88 /1.001Gbps)
  - DVB ASI (270Mbps)
- Immune to RP-198 pathological patterns
- Automatic reclocking
- One SDI loop out
- 12G/6G/3G/HD/SDI Input signal detection LED

**Note**:
1. RP-198 is the Pathological Patterns.
2. Fiber type: M = multi-mode; S = single-mode.
3. Maximum transmission length is dependent upon the optics module.
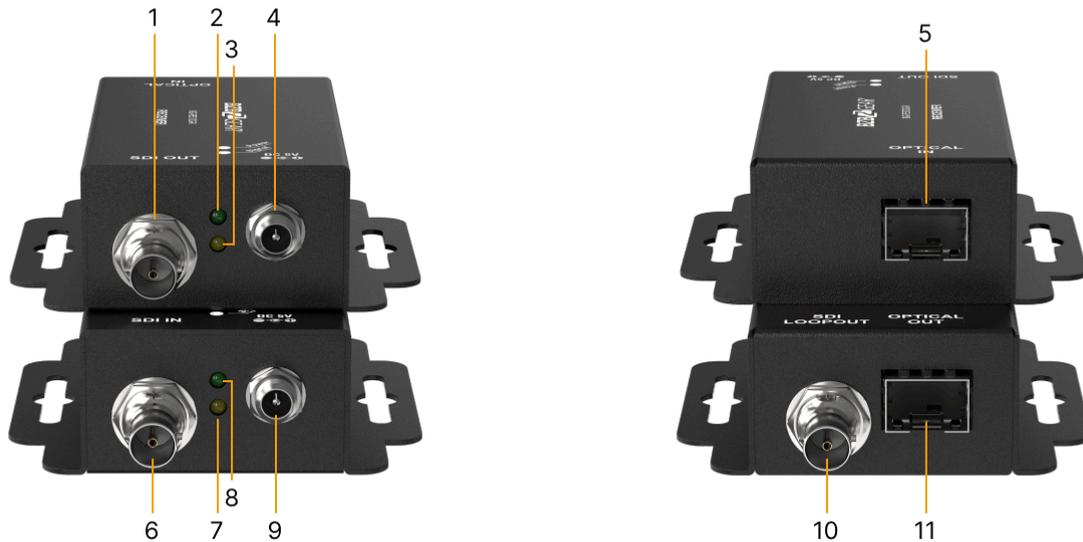
## Packing List

- 1x BG-FES12G
- 2x 5V power adapter
- 1x User Manual
- 1x Quick Start Guide

## Technical Specifications

| Technical | |
|---|---|
| SDI standard | SD-SDI/ HD-SDI/ 3G-SDI/ 6G-SDI/12G-SDI |
| Auto HD/SD-SDI detection | Yes |
| Supported protocols | SMPTE 259M (270Mbps / 360Mbps), DVB ASI (270Mbps)<br>SMPTE 292M / HDTV (1.485Gbps and 1.485/1.001Gbps)<br>SMPTE 424M / HDTV (2.97Gbps and 2.97/1.001Gbps)<br>SMPTE 2082-1 / HDTV (5.94Gbps and 5.94/1.001Gbps)<br>SMPTE 2082-2 / HDTV (11.88Gbps and 11.88/1.001Gbps) |
| Data rates | 270 / 1483 / 1485 / 2967 / 2970 / 5940 / 11880Mbps |
| Video bandwidth | [11.88Gpbs & 11.88/1.001Gbps] |
| Video support | [HD] 720p@50/59.94/60, 1035i@50/59.94/60, 1080i@50/59.94/60,<br>1080p@24/30,1080p@60,1080p@59.94, 4K2K@30, 4K2K@60<br>[SD] NTSC@59.94Hz, PAL@50Hz |
| SDI signal type | SMPTE 2082-2, SMPTE 2082-1, SMPTE-424M, SMPTE-292M, SMPTE-259M, DVB-ASI |
| Auto reclocker mode | Automatic detection: 270Mbps / 1.483Gbps / 1.485Gbps / 2.97Gbps / 2.967Gbps /<br>5.94Gbps / 5.934Gbps / 11880Gbps / 11868Gbps<br>Automatic bypass: 177Mbps / 360Mbps / 540Mbps |
| Output impedance | 75Ω |
| Fiber Transmission | 10km (6.25mi) |
| Loop-out | Transmitter: 1 reclocking SDI loop-out<br>Receiver: N/A |
| Input | Transmitter: 1x BNC [SDI] 1x Optical SFP [SDI]<br>Receiver: 1x Optical SFP [SDI] |
| Output | Transmitter: 1x BNC [SDI] (optional loop-out)<br>Receiver: 1x BNC [SDI] |
| BNC connector | 75Ω inter-locked socket |
| Audio support | Yes |
| PCB Stack-up | 4-layer board [impedance control — differential 100Ω ; single 50Ω ] |
| RP-198 pathological patterns | Immune |
| Optical fiber connector | SFP-type |
| **Mechanical** | |
| Housing | Metal case |
| Dimensions [L x W x H] | Model: 2.9" x 2.9" x 1.0" [74 x 74 x 26mm]<br>Package: 5.5" x 7.9" x 3" [140 x 200 x 75mm]<br>Carton: 1'5" x 1'4" x 11.8" [420 x 400 x 300mm] |
| Weight | Model: 7.4 oz [211g]<br>Package: 15.4 oz [440g] |
| Power supply | 5V 2A DC Inter-locked power supply |
| Power consumption | 3 Watts [max] |
| Operation temperature | 32~104°F / 0~40°C |
| Storage temperature | -4~140°F / -20~60°C |
| Relative humidity | 20~90% RH [no condensation] |

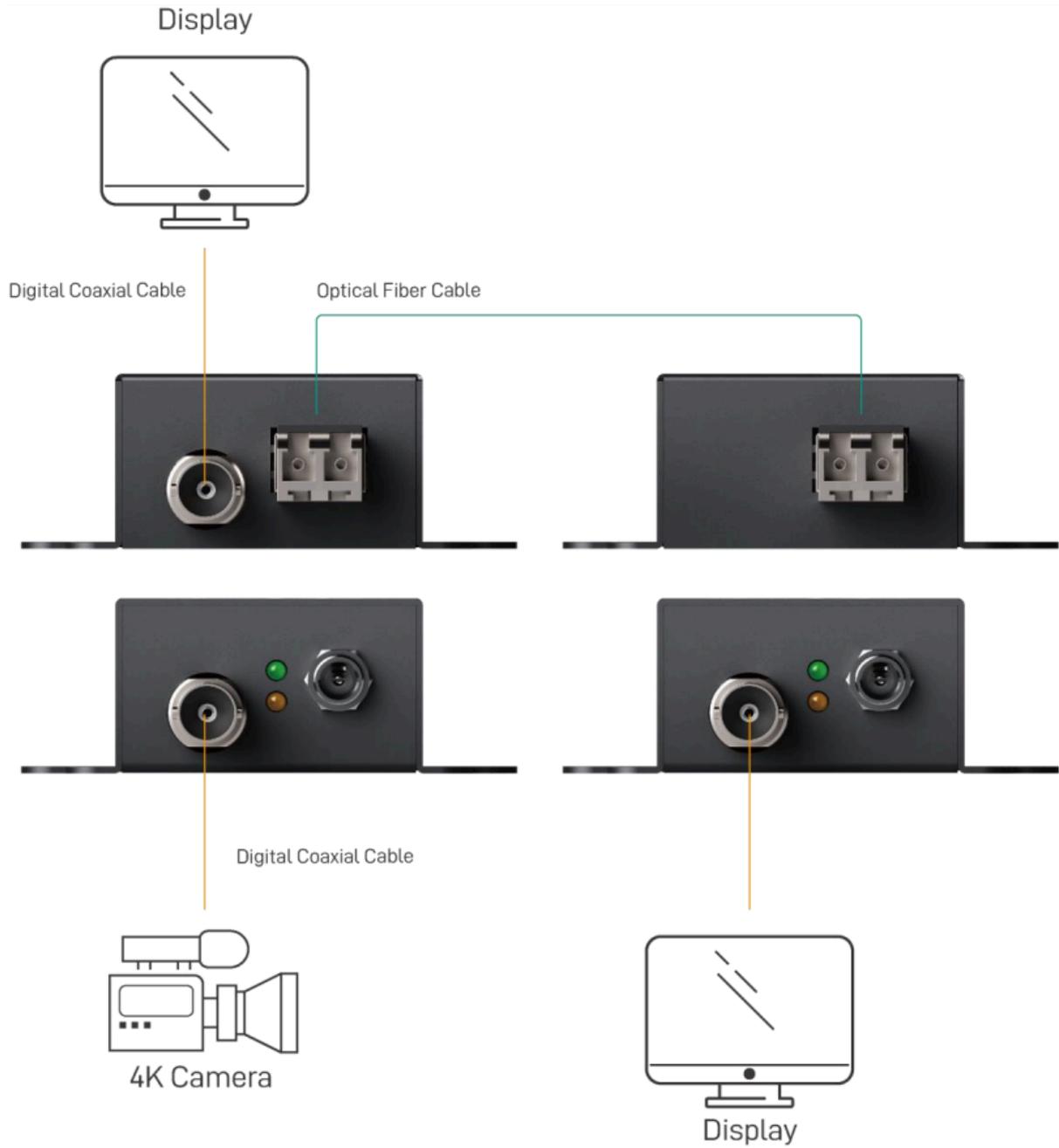# Operation Controls and Functions



## Receiver Panel

1. **SDI OUT**: 12G/6G/3G/HD/SD-SDI output.

2. **Power LED**: The LED illuminates green when the device is powered.

3. **Signal LED**: Signal indicator illuminates yellow when the receiver establishes a connection to the transmitter.

4. **DC 5V**: 5V DC power jack.

5. **Optical IN**: Optical in from the transmitting unit.

## Transmitter Panel

6. **SDI IN**: 12G/6G/3G/HD/SD-SDI input.

7. **Signal LED**: Signal indicator illuminates yellow when the transmitter establishes a connection to the receiver.

8. **Power LED**: The LED illuminates green when the device is powered.

9. **DC 5V**: 5V DC power jack.

10. **SDI Loopout**: 12G/6G/3G/HD/SD-SDI loopout.

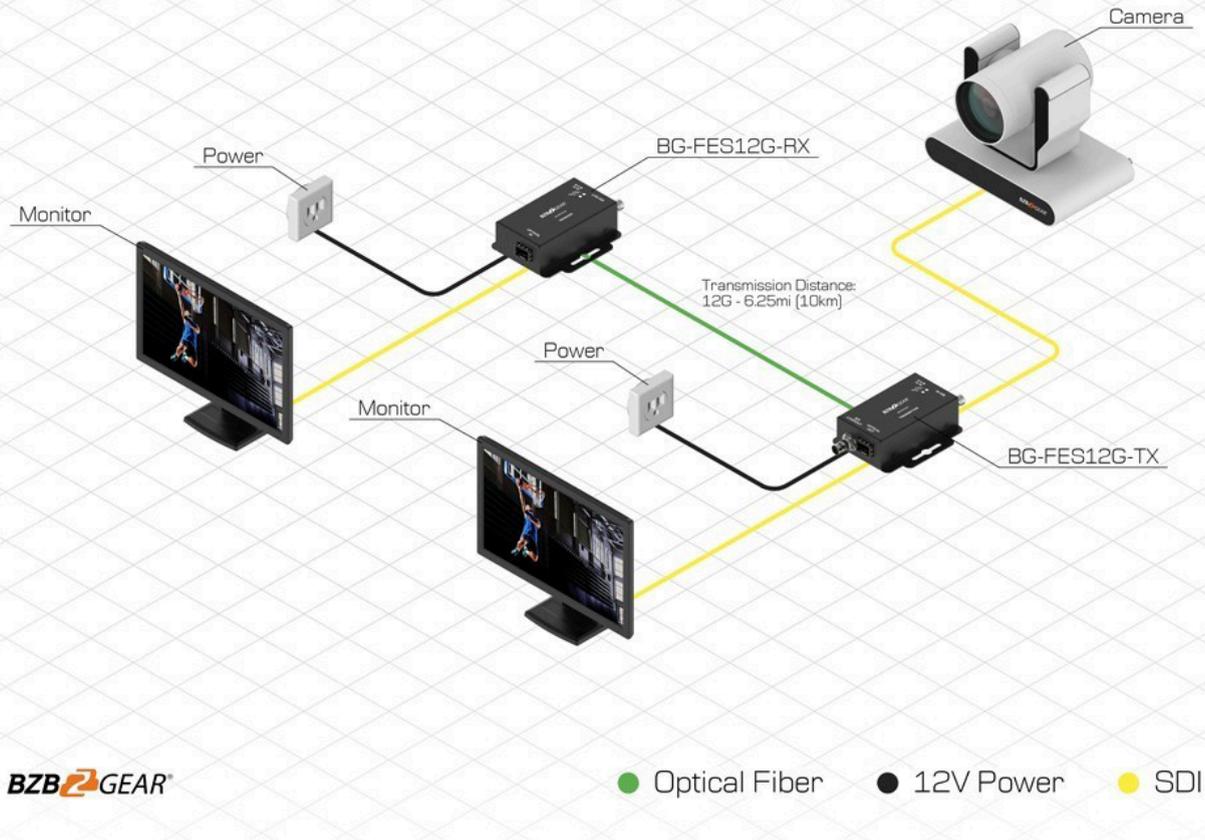11. **Optical OUT**: Optical output to the receiver unit.

## Connection Diagram



Display

Digital Coaxial Cable

Optical Fiber Cable

Digital Coaxial Cable

4K Camera

Display

# Application Example



BG-FES12G
Connection Diagram

Camera

Power

BG-FES12G-RX

Monitor

Transmission Distance:
12G - 6.25mi (10km)

Power

Monitor

BG-FES12G-TX

BZB**2**GEAR®

● Optical Fiber   ● 12V Power   ● SDI

## 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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