

BG-4KBHS-PRO

**HDMI 2.0 & 12G/6G/3G/HD-SDI Cross Converter and Scaler with
3.5" LCD Display/Audio Embedder/De-Embedder**

User Manual

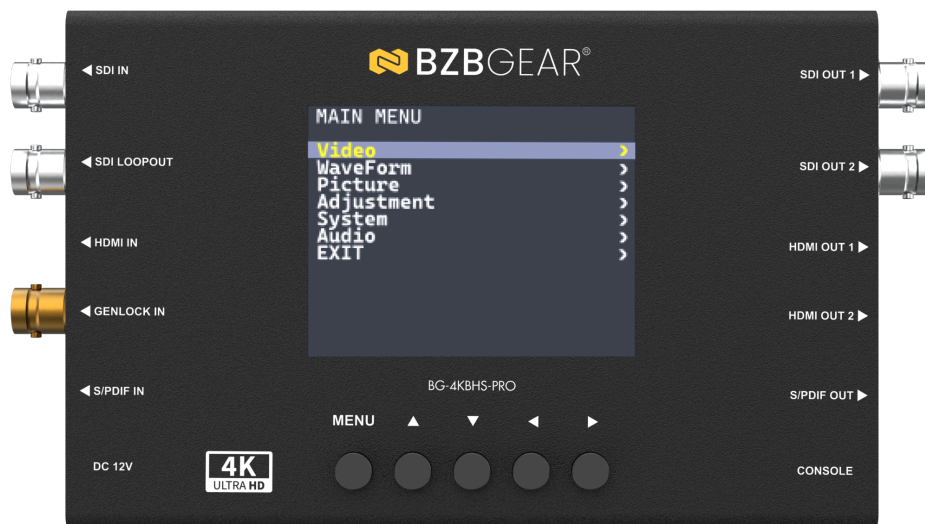






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Statement

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-4KBHS-PRO is a versatile HDMI 2.0 and 12G/6G/3G/HD-SDI cross-converter and scaler designed for professional monitoring, signal conversion, and testing applications. Equipped with a 3.5" LCD display and intuitive push-button controls, it provides real-time monitoring and on-screen display (OSD) management for resolution, image adjustments, and output configuration. With support for a wide range of formats - including 12G-SDI 4K60 and HDMI 2.0 up to 4K60 - it ensures compatibility across broadcast, production, and AV environments.

Beyond conversion, the BG-4KBHS-PRO functions as a powerful analysis and diagnostic tool. It offers waveform monitoring for YCbCr and RGB signals, audio level meters, and a range of built-in test patterns for signal verification and calibration. Additional features include audio embedding/de-embedding via S/PDIF, noise reduction, video enhancement, horizontal and vertical mirroring, and firmware upgradability.

Features

- **Video Format Support:**
 - 12G-SDI: 4K2K @ 50/59.94/60Hz
 - 6G-SDI: 4K2K @ 23.98/24/25/29.97/30Hz
 - 3G-SDI: 1080p @ 50/59.94/60Hz (4:4:4)
 - HD-SDI: 720p @ 50/59.94/60Hz, 1080i @ 50/59.94/60Hz, 1080p @ 24/30Hz
 - SD-SDI: NTSC @ 59.94Hz, PAL @ 50Hz
 - HDMI: Up to 4K2K @ 60Hz
- **Video Bandwidth:** SDI up to 11.88 Gbps, 11.88/1.001 Gbps; HDMI up to 18 Gbps
- **Resolution Support:** Multiple VESA standards supported for output video resolutions
- **Deinterlacing:** Enables smooth playback of interlaced video sources
- **Test Patterns:** Built-in video and output test patterns for calibration and troubleshooting
- **Cross Conversion:** Simultaneous HDMI ↔ SDI conversion with support for SDI to HDMI, HDMI to SDI, and same-format passthrough
- **Video Processing:** Supports noise reduction, video enhancement, H/V mirror, zoom, pixel-to-pixel, underscan, and check field functions
- **Waveform & Monitoring:** YCbCr waveform display and audio level meter with OSD overlay
- **On-Screen Display (OSD):** Menu-based control interface with monitoring features
- **Audio Functions:** Supports audio embedding and extraction via S/PDIF, with audio level bars display
- **Control Interface:** Push-button operation for quick setup and adjustments
- **Firmware Upgrade:** Upgradeable firmware ensures long-term compatibility and feature expansion



Packing List

- 1x BG-4KBHS-PRO
- 1x 12V DC Adapter
- 1x Product Manual



Specifications

Technical Specifications	
Role of Usage	HDMI 2.0 and 12G-SDI Bi-directional Scaler Converter with 3.5" LCD Monitor
SDI Standards	12G / 6G / 3G / HD-SDI
HDMI Standards	HDMI 2.0
Video Bandwidth	SDI: 11.88 Gbps, 11.88/1.001 Gbps HDMI: Up to 18 Gbps
Video Support	12G-SDI: 4K2K @50/59.94/60Hz 6G-SDI: 4K2K @23.98/24, 25, 29.97, 30Hz 3G-SDI: 1080p @50/59.94/60Hz (4:4:4) HD-SDI: 720p @50/59.94/60Hz, 1080i @50/59.94/60Hz, 1080p @24/30Hz SD-SDI: NTSC @59.94Hz, PAL @50Hz HDMI: Up to 4K2K @60Hz
Audio Support	PCM (48 kHz, up to 8 channels)
ESD Protection	- Human body model: ±15kV (air-gap discharge), ±8kV (contact discharge) - Core chipset: ±2kV
PCB Stack-up	8-layer board (Impedance control: differential 100Ω; single 50Ω)
Firmware Update	Via USB port
Connections Specifications	
Input	1 × HDMI 1 × BNC (SDI) 1 × TOSLINK
Output	2 × HDMI 3 × BNC (SDI out/loop-out) 1 × TOSLINK
BNC Connector	75Ω inter-locked socket
HDMI Connector	Type A (19-pin female)
USB Connector	Micro USB
Mechanical Specifications	
Housing	Metal enclosure
Power Supply	+12V DC

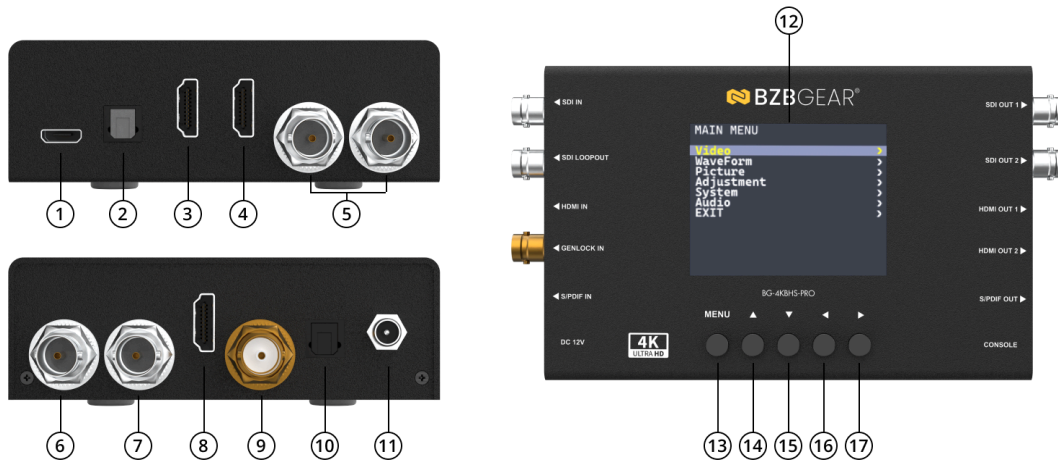


Operating Temperature	32 ~ 104°F / 0 ~ 40°C
Storage Temperature	-4 ~ 140°F / -20 ~ 60°C
Relative Humidity	20 ~ 90% RH (no condensation)



Operation Controls and Functions

Front and Rear Panel



1. **MICRO USB:** F/W update & console port for SW
2. S/PDIF OUT (TOSLINK)
3. **HDMI OUT 2:** Connect to a HDMI display
4. **HDMI OUT 1:** Connect to a HDMI display
5. **SDI OUT 1-2:** Connect to a 12G/6G/3G/HD/SD-SDI display
6. **SDI IN:** Connect to a 12G/6G/3G/HD/SD-SDI source
7. **SDI LOOPOUT:** Connect to a 12G/6G/3G/HD/SD-SDI display
8. **HDMI IN:** Connect to a HDMI source
9. **SDI GENLOCK:** Connect to a reference source
10. S/PDIF IN (TOSLINK)
11. **POWER JACK:** 12V DC power
12. 3.5" LCD Monitor
13. **PUSH BUTTON:** Enter OSD menu
14. **PUSH BUTTON:** OSD UP button
15. **PUSH BUTTON:** OSD DOWN button
16. **PUSH BUTTON:** OSD LEFT button
17. **PUSH BUTTON:** OSD RIGHT button



Main Menu Overview



The **Main Menu** provides access to all video, audio, and monitoring controls. From this menu, users can configure signal conversion, adjust image parameters, monitor waveforms, and manage audio routing. All settings are organized into clearly defined submenus for efficient navigation and operation.

The Main Menu consists of the following sections:

- **Video**
- **Waveform**
- **Picture**
- **Adjustment**
- **Audio**

Use the device's control interface to navigate through menu items. Settings take effect immediately unless otherwise indicated.

Video

The **Video** menu controls signal format, resolution, and conversion behavior.

Available functions include:

- Setting HDMI and SDI input and output resolutions
- Selecting the conversion direction between HDMI and SDI
- Adjusting frame rate, color space, bit depth, and deinterlacing options
- Accessing internal test patterns for signal verification and calibration



Waveform

The **Waveform** menu provides real-time video analysis tools for accurate signal monitoring.

Available functions include:

- Displaying live YCbCr or RGB waveform data
 - Monitoring brightness, color balance, and clipping levels
 - Overlaying waveform data on the live video image for verification
-

Picture

The **Picture** menu allows adjustment of image appearance and framing.

Available functions include:

- Adjusting brightness, contrast, saturation, and sharpness
 - Enabling horizontal and vertical image flip
 - Using zoom and pixel-to-pixel (1:1) display modes
 - Activating underscan and check field tools for precise framing and calibration
-

Adjustment

The **Adjustment** menu provides fine control over image processing and display behavior.

Available functions include:

- Fine-tuning display and scaling parameters
 - Optimizing image enhancement and noise reduction
 - Saving and recalling custom user presets
-

Audio

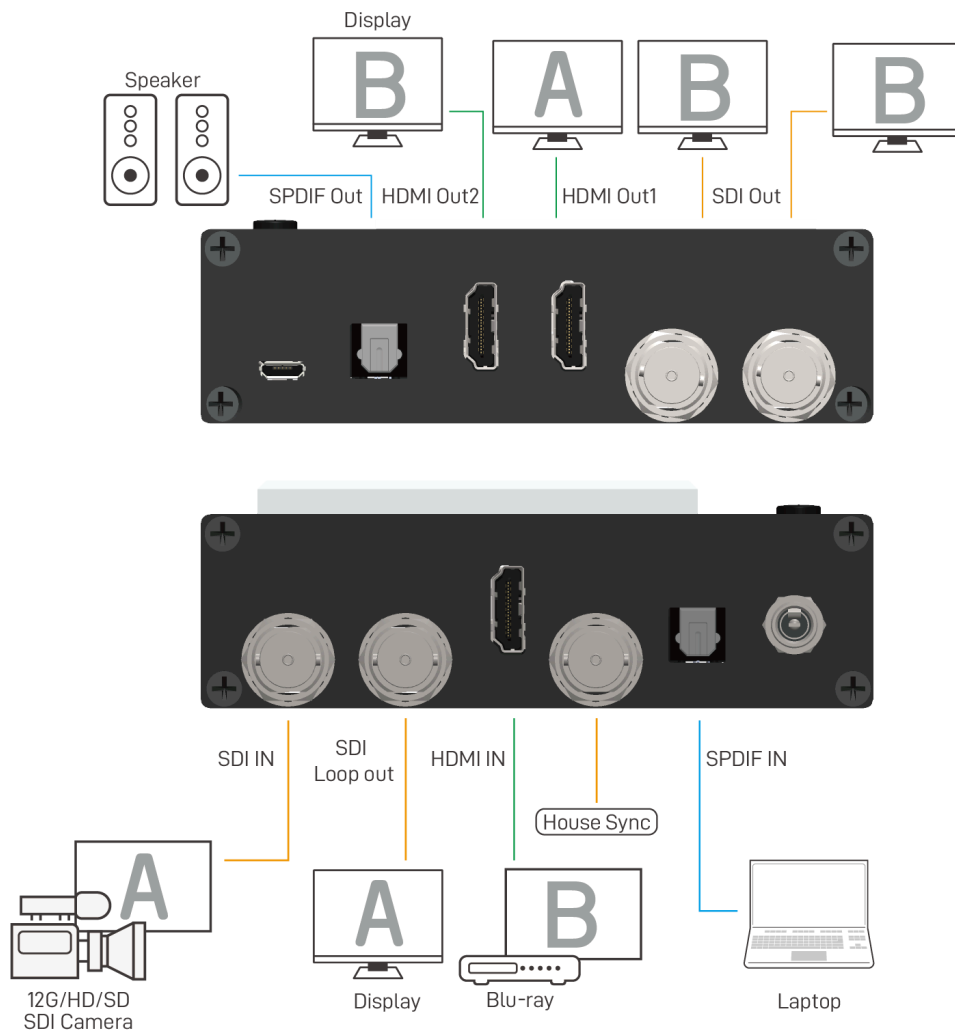
The **Audio** menu manages audio input selection, routing, and monitoring.

Available functions include:

- Selecting HDMI or S/PDIF audio input
- Embedding and de-embedding audio between HDMI and SDI signals
- Monitoring audio levels and adjusting gain and channel mapping



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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