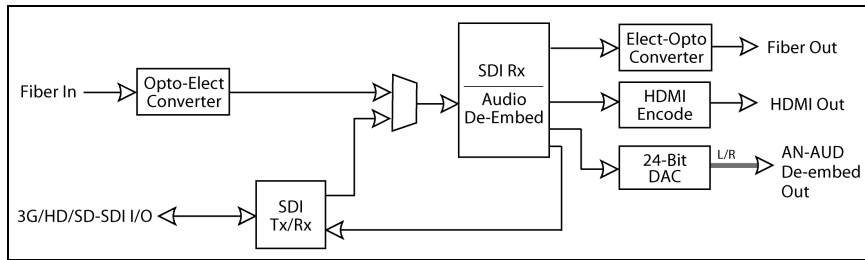


BBG-F-TO-H

3G/HD/SD-SDI Fiber
Optic-To-HDMI Converter

The **BBG-F-To-H Fiber Optic-To-HDMI Converter** (hereinafter called “BlueBox™ F-To-H”) provides a small “throwdown” package that provides direct fiber-to-HDMI conversion and other conversions. BBG-F-TO-H to also act as a fiber regen while providing an HDMI output. The HDMI output can be set to instead provide a DVI-D output directly compatible with computer monitors. BBG-F-TO-H also can receive a coax SDI input (SMPTE 259M, 292M, and 424M) and in turn provide an HDMI and a fiber output. BBG-F-TO-H can also provide a coax SDI output while converting fiber to HDMI. A convenience stereo analog audio de-embed output is also provided.

The unit receives its DC power from either connecting its USB port to associated equipment, or by the supplied AC adapter (dual-sourcing provides redundancy).



Connecting BlueBox™ F-To-H

1. Connect BlueBox™ F-To-H to DC power using the supplied AC adapter or USB connection.
2. Remove any protective caps on fiber cables and/or input receptacles. Connect BNC Coax input/outputs, HDMI, and Fiber input/outputs to desired input/output connectors. This provides the basic conversion connections. Unused connections do not require termination.

	<p>CLASS 1 LASER PRODUCT IEC 60825-1:2007 Caution - INVISIBLE LASER RADIATION. AVOID EXPOSURE TO THE BEAM.</p>
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Status Indicator

BlueBox™ F-To-H has **Status** LEDs (one LED for the fiber input channel and one for the coax input channel) on the side of the unit which function as follows:

- **Solid Green** – Recognized SDI present.
- **Green Flash** – Non-SDI present, or not recognized as SDI.

Configure Select Using DIP Switch Bank

BlueBox™ F-To-H can be used in a local control mode using DIP switches to configure settings, or via USB remote control. The USB remote also provides an optical Tx power meter for Tx confidence assessment. Refer to diagram on unit label for switch positions.

- **If using DIP switch control**, make certain switch SW1 is set to **ON**. USB remote control is locked out in this mode.
- **If using USB remote control**, make certain switch SW1 is set to **OFF**. DIP switch local control is locked out in this mode.

Input Routing Select Switches

BlueBox™ F-To-H DIP switches SW2 and SW3 allow for selecting from either SDI coaxial input via **SDI I/O** or SFP input via **SFP I/O** as shown below and on rear label on unit. The Failover choices allow selecting from either SDI or SFP as the Primary input to be used (**Pri**), with failover to Secondary (**Sec**) as shown.

SW 2	SW 3	
OFF	OFF	Fiber In > SDI/HDMI/Fiber Out
OFF	ON	SDI In > HDMI/Fiber Out
ON	OFF	Failover In: Fiber Pri/SDI Sec > HDMI/Fiber Out
ON	ON	Failover In: SDI Pri/Fiber Sec > HDMI/Fiber Out

Audio De-Embed Select Switches

BlueBox™ F-To-H DIP switches SW4 thru SW6 allow for selecting de-embed to be applied to the HDMI output as well as stereo downmix to the convenience analog audio

AN-AUD L/R OUT TRS 3.5mm stereo connector using DIP switch bank as shown below and on the unit label.

SW 6	ON	HDMI Custom Line-up (L R C LFE Ls Rs)
SW 6	OFF	HDMI Standard Line-up (L R LFE C Ls Rs)
SW 4	SW 5	
OFF	OFF	Emb 1/2 > AN AUD OUT L/R
OFF	ON	Emb 3/4 > AN AUD OUT L/R
ON	OFF	Emb 5/6 > AN AUD OUT L/R
ON	ON	Emb 7/8 > AN AUD OUT L/R

Unbalanced Audio Levels and This Device

The unbalanced audio outputs on this device (available on the **AN-AUD L/R OUT** TRS 3.5mm stereo connector) correspond to 2.2 Vrms output when sourced from a unity-gain 0 dBFS digital sine-wave source. Consumer audio is specified in dBV with a nominal (or recording) level of -10 dBV. The 2 Vrms maximum output level corresponds to +6 dBV. The unbalanced analog outputs on this device allow for 16 dB of headroom above the nominal -10 dBV consumer level (“headroom” is the range between the maximum and nominal audio levels). Professional balanced analog audio levels in the US typically use a +4 dBu nominal level with 20 dB of headroom (-20 dBFS). The maximum level for balanced analog interfaces is +24 dBu.

The headroom difference between consumer and professional audio will result in a lower consumer level when converting from professional balanced analog audio. For example, if pro level analog audio is received and transmitted via AES or embedded SDI to a receiver converting to unbalanced analog audio, the output will be 4 dB lower, with a nominal level of -14 dBV.

Channel Line-Up of HDMI vs. Standard SDI Conventions

To maintain conformance with CEA-861D HDMI audio channel line-up specifications and industry standard SDI convention, this device has DIP switch SW6 that selects audio line-up on the HDMI output as listed below (SDI line-up is always per SDI convention).

Signal Format/Channels	1	2	3	4	5	6
Standard SDI Convention	L	R	C	LFE	Ls	Rs
HDMI CEA-861D	L	R	LFE	C	Ls	Rs

HDMI/DVI Mode Switches

BlueBox™ F-To-H can typically automatically detect connection to a downstream device as either an HDMI port or a DVI (monitor) port. However, switches **SW7** thru **SW9** allow setting BlueBox to force a DVI output suitable for direct connection to monitors using a DVI input in case the connection is not detected by the monitor. (Refer to illustration on rear panel label on unit for switch positions.)

- **SW7** – Set to **ON** to allow manual control of HDMI/DVI mode.
- **SW8** – Set to **ON** to force DVI output mode.
- **SW9** – Set to **ON** to force RGB color space (intended mode for monitor usage).

Note: • Colorspace SW9 and DVI/HDMI Select SW8 only work when SW7 is set to Manual.
 • Connect monitor to BlueBox™ F-To-H and then set switches to ensure monitor gets handshake to “see” connection.

BlueBox™ F-To-H Configurations

BlueBox™ F-To-H is factory-configured using SFP hardware options as described below.

Model	Description
BBG-F-H-FC	3G/HD/SD-SDI Fiber Optic-To-HDMI Converter (Type FC fiber connectors)
BBG-F-H-ST	3G/HD/SD-SDI Fiber Optic-To-HDMI Converter (Type ST fiber connectors)
BBG-F-H-LC	3G/HD/SD-SDI Fiber Optic-To-HDMI Converter (Type LC fiber connectors)

Warranty and Service Information

Cobalt Digital Inc. Limited Warranty

This product is warranted to be free from defects in material and workmanship for a period of five (5) years from the date of shipment to the original purchaser, except that 4000, 5000, 6000, 8000 and Blue Box series power supplies, and Dolby® modules (where applicable) are warranted to be free from defects in material and workmanship for a period of one (1) year.

Cobalt Digital Inc.'s (“Cobalt”) sole obligation under this warranty shall be limited to, at its option, (i) the repair or (ii) replacement of the product, and the determination of whether a defect is covered under this limited warranty shall be made at the sole discretion of Cobalt.

This limited warranty applies only to the original end-purchaser of the product, and is not assignable or transferrable therefrom. This warranty is limited to defects in material and workmanship, and shall not apply to acts of God, accidents, or negligence on behalf of the purchaser, and shall be voided upon the misuse, abuse, alteration, or modification of the product. Only Cobalt authorized factory representatives are authorized to make repairs to the product, and any unauthorized attempt to repair this product shall immediately void the warranty. Please contact Cobalt Technical Support for more information.

To facilitate the resolution of warranty related issues, Cobalt recommends registering the product by completing and returning a product registration form. In the event of a warrantable defect, the purchaser shall notify Cobalt with a description of the problem, and Cobalt shall provide the purchaser with a Return Material Authorization (“RMA”). For return, defective products should be double boxed, and sufficiently protected, in the original packaging, or equivalent, and shipped to the Cobalt Factory Service Center, postage prepaid and insured for the purchase price. The purchaser should include the RMA number, description of the problem encountered, date purchased, name of dealer purchased from, and serial number with the shipment.

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Specifications

Item	Description/Specification
Part Number/ Nomenclature:	3G/HD/SD-SDI Fiber Optic-To-HDMI Converter (see BlueBox™ F-To-H Configurations for model types)
Power:	5-16 VDC, 2.4 W DC Power Connectors USB Mini and coaxial locking connector (for use with supplied Cobalt power adapter)
Standards Supported (SDI):	SMPTE 259M, 292M, 424M
Inputs/Outputs:	(1) Fiber input. FC, ST, or LC connectors per ordered configuration (1) Fiber regen output. FC, ST, or LC connectors per ordered configuration (1) SDI I/O (mode user selectable) (1) HDMI output (HDMI 1.4a compliant). HDMI output can be set as DVI-D (limited to SMPTE HD formats). (1) Stereo analog audio out (L/R unbalanced pair via 3.5mm TRS jack)
Audio Conversion Format	48 kHz sampling, 24-bit 8-Ch HDMI to SDI groups 1 and 2
USB Port	Mini-USB (used for power source, USB remote control connection, and firmware upgrade upload to device)
Dimensions (WxHxD):	5.5" x 3" x 1" (including connector projections) (139 x 77 x 26 mm)
Operating Temperature Range	32°F to 122°F (0°C to 50°C)

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