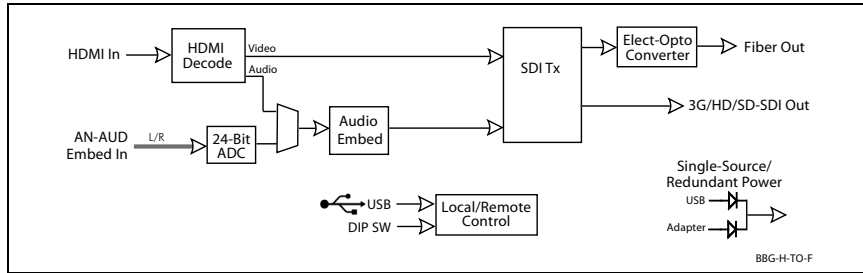


# BBG-H-TO-F

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

The **BBG-H-To-F HDMI-To-Fiber Optic Converter** (hereinafter called “BlueBox™ H-To-F”) provides a small “throwdown” package that provides direct HDMI-to-fiber conversion and other conversions. BBG-H-TO-F also provides a 3G/HD/SD-SDI output, and also provides a stereo analog audio embed input. The HDMI input can also receive and convert DVI-D sources (limited to SMPTE HD formats). Along with the analog audio embedding offered by BBG-H-TO-F, this allows a fiber and coax SDI output with embedded audio from DVI-D video sources.

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™ H-To-F

1. Connect BlueBox™ H-To-F 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.

**CLASS 1 LASER PRODUCT**  
IEC 60825-1:2007  
Caution - INVISIBLE LASER RADIATION. AVOID EXPOSURE TO THE BEAM.

## Status Indicator

BlueBox™ H-To-F 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 SMPTE format present on HDMI input.
- **Green Flash** – Non-SDI present, or not recognized as SDI.

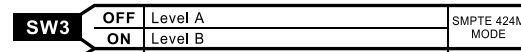
## Configure Select Using DIP Switch Bank

BlueBox™ H-To-F 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.

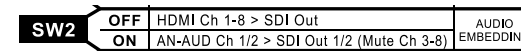
## SMPTE 424M Mode Select Switch

BlueBox™ H-To-F DIP switch SW3 allows for selecting from either SMPTE 424M Level A or Level B as shown.



## Audio Embed Select Switches

BlueBox™ H-To-F DIP switch SW2 allows for selecting embedding to SDI output from HDMI input, or from external analog audio AN-AUD1/2 (stereo) as shown below and on the unit label. (Embedding selection applies to the fiber output and the coaxial SDI output.)



## Unbalanced Audio Levels and This Device

The unbalanced TRS (tip-ring-sleeve) 3.5mm L/R audio input on this device will correspond to 0 dBFS when driven with a 2.2 Vrms input. Consumer audio is specified in dBV with a nominal (or recording) level of -10 dBV. The 2 Vrms maximum input level corresponds to +6 dBV. The unbalanced analog inputs 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).

If these inputs are driven by half of a balanced audio source (connections using the + and GND connections to the BBG input), a **6 dB loss** should be expected. To compensate for this, the upstream gain should be increased by 6 dB where headroom is available.

## 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 provides the line-up conversion from HDMI convention to SDI convention as listed below.

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

## BlueBox™ H-To-F Configurations

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

Model	Description
BBG-H-TO-F-FC	3G/HD/SD HDMI-To-Fiber Optic Converter (Type FC fiber connector)
BBG-H-TO-F-ST	3G/HD/SD HDMI-To-Fiber Optic Converter (Type ST fiber connectors)
BBG-H-TO-F-LC	3G/HD/SD HDMI-To-Fiber Optic Converter (Type LC fiber connector) (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 HDMI-To-Fiber Optic Converter (see BlueBox™ H-To-F 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) HDMI input (HDMI 1.4a compliant). DVI-D compliant input (limited to SMPTE HD formats). (1) Fiber output. FC, ST, or LC connectors per ordered configuration (see Ordering Info). (1) Stereo analog audio pair in (L/R unbalanced pair via 3.5mm TRS jack) (1) SDI output
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)



BBG-H-TO-F-IS (V1.0)

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