



# HDMI-To-SDI Converter

HDMI-to-3G/HD/SD-SDI with Audio Embedder  
BBG-H-TO-S

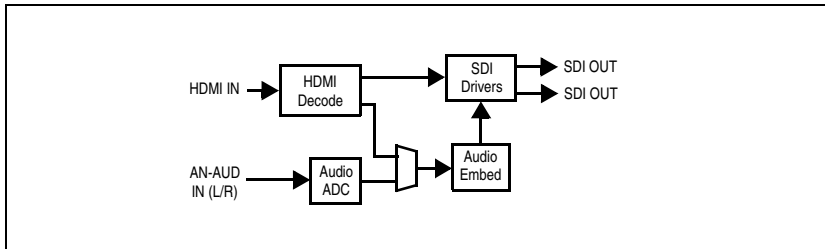
The **BlueBox™ HDMI-To-SDI Converter** (hereinafter “BlueBox™ BBG H-TO-S”) provides a small “throwdown” package that offers HDMI to 3G/HD/SD-SDI conversion, with direct conversion from HDMI to SDI SMPTE 259M, 292M, and 425M. True conversion to 1080p5994/50 SDI is available when using an HDMI source containing 1080p content. The supported HDMI input formats are listed below:

• 1920 x 1080p50/5994/60 4:2:2 (SMPTE 425M (3G))	• 720 x 480i5994 (SD-NTSC)
• 1920 x 1080i50/5994/60 1920 x 1080p2398/24/25/2997/30 1920 x 1080psf25/2997/30 1280 x 720p50/5994/60	• 720 x 576i50 (SD-PAL)

**Note:** For all formats, only 10-bit protocols are supported.

**Note:** BlueBox™ BBG H-TO-S does not perform format cross, up, or down-conversions.

The unit receives its DC power from either connecting its USB port to associated equipment, or by the supplied AC adapter.



## Connecting BlueBox™ BBG H-TO-S

- 1 Connect BlueBox™ H-TO-S to DC power using either or both the USB port or the supplied AC adapter. Dual source (simultaneous) use provides power redundancy.

**Note:** USB connection derives only DC operating power from USB port. This connection does not provide remote control or monitoring.

2. Connect HDMI input and SDI output(s). This provides the basic conversion connections. Other connections do not require termination if unused.

## Audio Embedding

BlueBox™ BBG H-TO-S provides embedding to the SDI output in either of two modes as described below using the DIP switch bank on the underside of BlueBox™ BBG H-TO-S. Refer to label on unit for switch positions.

- **SW 6 – OFF:** HDMI channels 1-8 routed to SDI channels Emb Ch 1-8 (Emb Ch 9 thru 16 are muted in this mode).
- **SW 6 – ON:** External analog stereo audio input **AUDIO IN (L/R)** routed to Emb Ch 1 and 2, respectively (Emb Ch 3 thru 16 are muted in this mode).

## Unbalanced Audio Levels and This Device

The unbalanced “RCA” audio inputs 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 RCA jack), 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 lines up audio as shown below with a swap between the C and LFE channels.

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

BlueBox™ BBG HDMI-to-SDI and SDI-to-HDMI converters bilaterally conform to the conventions shown here, with back-to-back connection resulting in proper channel line-up for HDMI and SDI. Connection to non-conforming devices, however, may result in an unexpected channel 3/4 swap which can be remedied using an SDI audio crosspoint.

## Status Indicator

BlueBox™ BBG H-TO-S has a **Status LED** on the side of the unit which functions as follows:

- **Solid ON** – Input lock OK.
- **Slow Flash** – Unlocked to input video; input video not present
- **Rapid Flash** – Detected input video is of format specifically not supported

## Specifications

Item	Description/Specification
Standards supported:	SMPTE 259M, 292M, 425M
Inputs:	- HDMI (HDMI 1.4a compliant) - Analog audio in L/R pair, unbalanced “consumer” level RCA - DC Power (+5 VDC via USB or adapter)
Outputs:	(2) SDI, 75Ω BNC
Audio conversion format:	48 kHz sampling, 24-bit, 8-Ch to SDI groups 1 and 2.
Power source:	5-16 VDC, 2.4 W. Power-sourced directly from host equipment USB port. Can also be powered using corded AC adapter (included)
Dimensions (WxHxD):	5.5" x 3" x 1" (including connector projections) (139 x 77 x 26 mm)

## 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 transferable 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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The logo for Cobalt Digital Inc. features the word "COBALT" in a blue, sans-serif font. The letters are spaced out, and the "O" and "A" are slightly larger than the other letters. The logo is positioned to the left of the contact information for Cobalt Digital Inc.

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