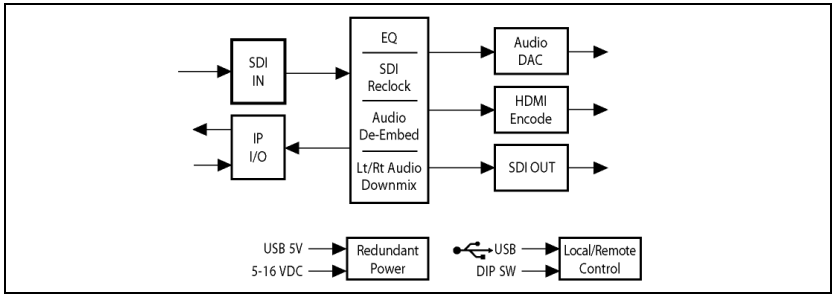
•BBG-SDI-TO-IP-10GE-2022
•BBG-SDI-TO-IP-10GE-2110

IP To 3G/HD/SD-SDI Encapsulators
with SDI, HDMI and Stereo Analog Audio Monitoring Outputs

The **BlueBox™ SDI-To-IP Encapsulators** (hereinafter "BlueBox™ SDI-TO-IP") provide a small "throwdown" package that provides the flexibility of SDI-to-IP encapsulation as well as providing an HDMI output, a reclocked SDI coax output, and a convenience analog stereo de-embed monitor pair with built-in Lt/Rt downmixer.

Note: BlueBox™ SDI-TO-IP 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™ SDI-TO-IP

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

2. Connect Fiber IP and SDI input and/or HDMI outputs. This provides the basic encapsulator connections. Other connections do not require termination if unused.

Status Indicator

BlueBox™ SDI-TO-IP has a **Status** LED on the side of the unit which functions as follows:

- **Solid Green** – SDI present and being encapsulated; HDMI has sync.
- **Green Flash** – No SDI; no HDMI sync.
- **Solid Green w/ brief Red Flash** – SDI present, but no HDMI sync.
- **Amber Flash** – Device setting has been changed via BBGConfig USB remote control and waiting to write (store) in memory. This lasts about 10 seconds following a setting change. No amber flashing indicates change is stored in non-volatile memory.
- **Red Flashing** – Indicates device is in boot loader mode (this mode is invoked when device firmware is being upgraded).

Audio De-Embedding

BlueBox™ SDI-TO-IP provides de-embedding from the SDI source input to analog audio outputs. Refer to illustration on rear label on unit for switch positions.

- SDI channels Emb 1-8 are normally routed to HDMI channels 1-8.
- SDI embedded channels 1/2, 3/4, 5/6, or 7/8 can be de-embedded to the stereo **AN-AUD L/R OUT** TRS 3.5mm stereo connector using DIP switch bank as shown on the unit label.

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 a DIP switch that selects audio line-up on the HDMI output as listed below (SDI output line-up and encapsulation 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

Configure Select Using DIP Switch Bank

BlueBox™ SDI-TO-IP can be used in a local control mode using DIP switches to configure settings, or via USB remote control. 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.

HDMI/DVI Mode Switches

BlueBox™ SDI-TO-IP can typically automatically detect connection to a downstream device as either an HDMI port or a DVI (monitor) port. However, switches **SW8** thru **SW10** 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.)

- **SW8** – Set to **ON** to allow manual control of HDMI/DVI mode.
- **SW9** – Set to **ON** to force DVI output mode.
- **SW10** – Set to **ON** to force RGB color space (intended mode for monitor usage).

Note: Connect monitor to BlueBox™ SDI-TO-IP and then set switches to ensure monitor gets handshake to "see" connection.

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
Standards supported:	(model BBG-SDI-TO-IP-10GE-2110) SMPTE 259M, 292M, 424M, ST 2110, ST 424, ST 292, and ST 259 (model BBG-SDI-TO-IP-10GE-2022) SMPTE 259M, 292M, 424M, ST 2022-6 (HBRMT), ST 2022-7, ST 424, ST 292, and ST 259
Inputs/Outputs:	(1) 3G/HD/SD-SDI 75Ω BNC input (1) GigE Fiber I/O; Multi-Mode; LC connectors (1) 3G/HD/SD-SDI 75Ω BNC reclocked output Fiber Wavelength, Tx: 1310 nm Tx Power: -5.0 dBm (min) (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) SDI Formats Supported: SMPTE 259M, SMPTE 292M, SMPTE 424M
Audio Conversion Format:	48 kHz sampling, 24-bit 8-Ch HDMI from SDI groups 1 and 2
Power source:	Power-sourced directly from host equipment USB port. Converter can also be powered using corded AC adapter (included)
Power:	5-16 VDC, 5W
DC Power Connectors:	USB Mini and coaxial locking connector (for use with supplied Cobalt power adapter)
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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