COBALT

BBG-1022-2FS • 3G/HD/SD-SDI Standalone Dual-Channel Frame Sync
with Audio/Video Processing, AES/Analog Audio Embedding/De-Embedding and CVBS I/O

The Cobalt® **BBG-1022-2FS 3G/HD/SD-SDI Standalone Dual-Channel Frame Sync** with Audio/Video Processing, AES/Analog Audio Embedding/De-Embedding and CVBS I/O offers **two independent signal paths** of frame sync / audio embedding and de-embedding in a single unit.

Advanced frame sync features include per-channel audio delay, audio/video offset, and output rate conversion to and from 23.98/29.97/59.94 to 24/30/60 frame rates. Frame sync can select from multiple reference inputs, with failover to alternate selected sources. Each path can independently use either of two frame references or internal reference.

Audio embed adaptive SRC allows asynchronous 48 kHz AES audio to automatically sync with program video 48 kHz timing for glitch-free embedding. Individual, per-pair SRC auto-detects and disables SRC when a Dolby pair is detected on an input pair. Bulk and per-channel audio delay controls easily address lip-sync issues.

A convenient input crosspoint can select from up to four SDI inputs to be applied to either of the unit's two processing paths. The input crosspoint allows manual or failover to alternate inputs on loss of input conditions. For each path, two discrete character burn strings can be inserted on output video, with each string inserted as static text and/or insert only upon LOS.

With option **+T-SLATE**, import of user trouble slate graphics is also supported in addition to standard test pattern insert as an input LOS/quality event marker. Moving-box insertion can serve as a dynamic raster confidence check even when the input video image is static. Included standard is closed captioning absence/presence detection for CEA 608/708 and line 21 SD closed captioning. Option **+TTS** provides high-quality Text-To-Speech synthesis, directly converting EAS text to digital audio speech with no baseband signal breakouts or add-ons. With option **+ANC**, the BBG-1022-2FS offers full VANC/HANC ancillary data packet de-embedding and embedding.

Preset save/load allows saving custom settings while allowing one-button revert to factory settings. Layered presets allow invoking changes related only to a specific area of concern (audio routing, for example) while not changing any other processing settings or aspects. The BBG-1022-2FS can be remote-controlled using DashBoard™. GPIO allows direct input routing control and status monitoring. The compact standalone form factor allows desktop usage, as well as the 1/3-rack size of the BBG-1022-2FS allowing 3 units to be installed in a 1RU space (an optional mounting tray is available that provides secure mounting of the units to a standard 19" frame).

FEATURES

Two independent processing paths

Supports all popular formats: 480i, 576i, 720p, 1080i, 1080pSF, 1080p

Multi-input RP168 clean switch. Path inputs can also be sourced from opposite path output with no external patching.

Auto-Changeover can be set to invoke failover for basic input loss

Moving-box insertion serves as a dynamic raster confidence check even in cases where the input video image is static

Frame Sync with full H/V offset and manual/LOS video pattern generator. Pattern generator for each channel can provide raster/test pattern and patterns for LOS failover

Per-path dual independent burn-in text string insertion allows condition-based insertion (such as basic ID text for valid input and different text message for failover conditions)

Timecode processing can prioritize, filter for, and convert between specific SMPTE embedded-video or audio LTC, with output/burn-in timecode using selected format

Advanced audio processing allows routing, gain, delay, and flexible mixing as standard features

Full audio crosspoint with delay control and 5.1-to-stereo downmix available for all audio outputs

CVBS analog video I/O and analog/AES embed / de-embed with 4-line Adaptive Comb Filter

Video options include color correction and keying

Low-power/high-density design – less than 18 Watts

Compact footprint – up to 3 units in a 1RU space. Optional tray provides secure captive-fastener mounting of 3 units in a 1RU tray.

Remote control/monitoring via DashBoard™ software, OGCP-9000 Remote Control Panel, or Web Browser User Interface

Five year warranty

OPTIONS

Quality Check (**+QC**) – Provides failover, alert, or user presets action on criteria such as black/frozen frame, audio silence, and CC absence.

Key/Fill Keyer (**+KEYER**) – Provides keying using independent SDI inputs for key and fill signals.

Color Correction (**+COLOR**) – Full RGB color corrector (offset, gain, gamma) with extended YCbCr proc controls with white/black hard clip, white soft clip, and saturation clip

Ancillary Data Processor (**+ANC**) – Provides full user VANC/HANC packet insertion/extraction access to DID/SDID ancillary data

Text-To-Speech (**+TTS**) – Provides Text-To-Speech synthesis, directly converting EAS text to digital audio speech with no baseband signal breakouts or add-ons. High-quality Text-To-Speech from Acapela Group.

Emergency Alert System Text Crawl Generation Option (**+EAS**) – Provides a single-device solution for keying Emergency Alert System (EAS) text crawls in the active video and inserting station identification logos. Compatible with Sage™, Dasdec™, and other EAS crawl generators, with automated control insertion via presence of crawl data or GPI.

Trouble Slate Import Option (**+T-SLATE**) – Allows uploading of up to three different user trouble slate graphic file to the BBG unit, with automated insertion controlled by GPI or other events.

Logo Insertion Option (**+LOGO**) – Allows uploading of user logo graphic file to BBG unit, with automated insertion controlled by GPI or other events.

Clean and Quiet Switching Option (**+CQS**) – Provides automatic audio muting during switching transitions from one SDI input source to another to provide silence between input switches

Expanded Delay (**+DLY**) – Increases frame buffer to provide adjustable audio/video delay buffer capacity to over 9 seconds for SD video, 1.5 seconds for HD video, or 0.8 seconds for 3G video.

SCTE 104 Insertion (**+SCTE104**) – Provides generation/insertion of SCTE 104 data into baseband SDI. Message send can be triggered from automation GPI or other modes. Full control of splice start, end, and cancel as well as pre-roll offsets.

SCTE104 Frame-Accurate SCTE Trigger Insertion Option (**+SCTE104-FAST**) - Uses Time Stamp data derived from broadcast automation to provide deterministic, frame-accurate Digital Program Insertion (DPI) message embedding into SDI. The linear channel is output with precise metadata marking the beginning and ending of each program and commercial segment, optimizing it for automatic dissemination to CDN and VOD systems.
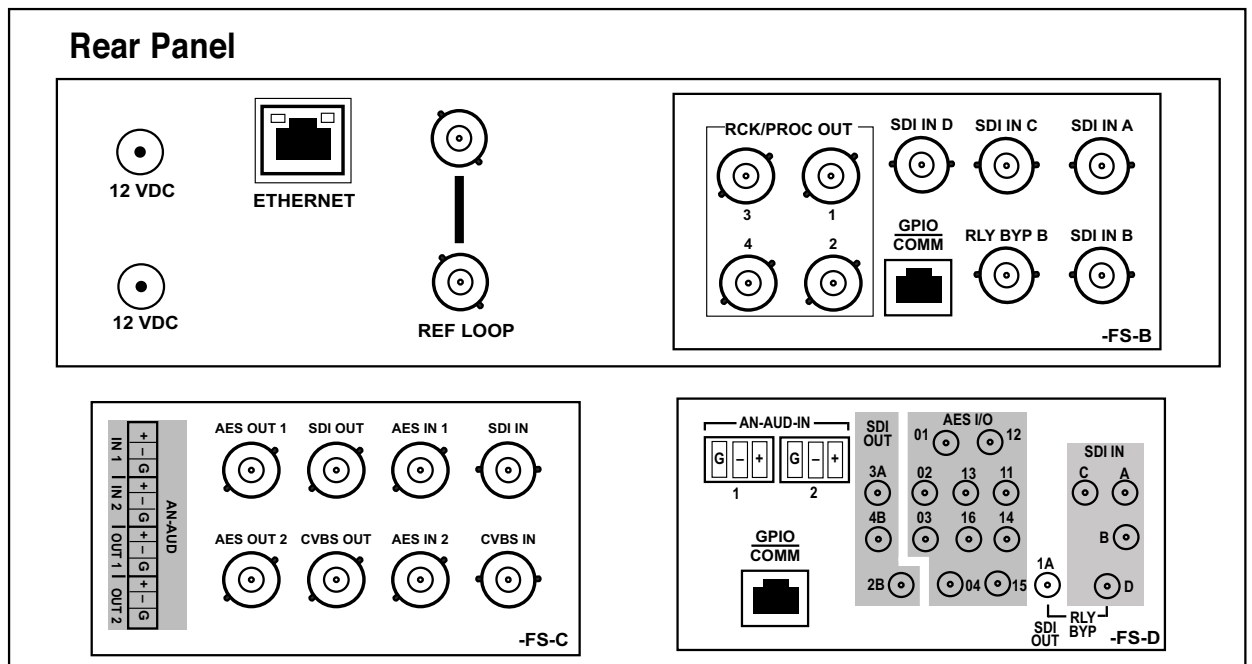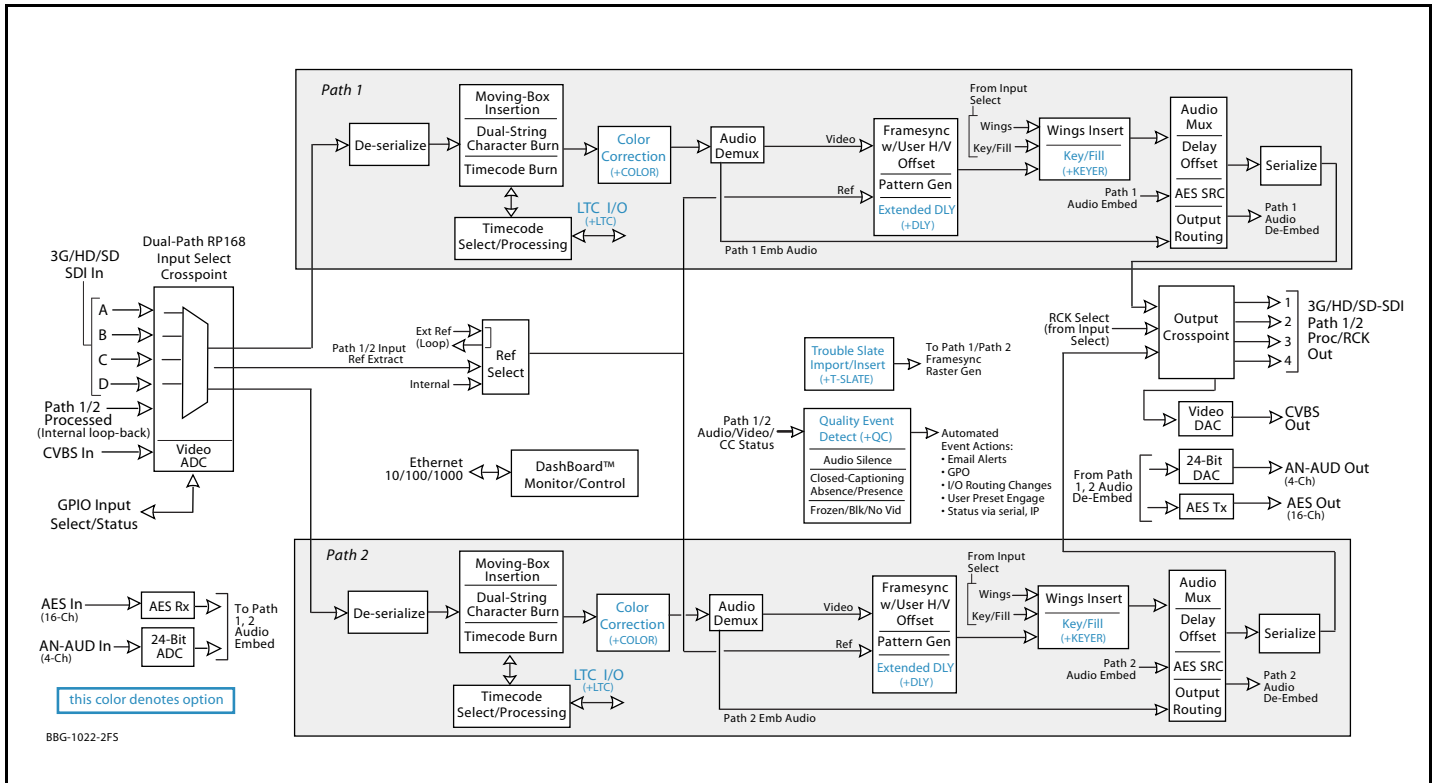
Audio LTC I/O (**+LTC**)

Redundant Power Supply Module (**BBG-1000-PS**)

1RU Mounting Tray (supports 3 units) (**BBG-1000-TRAY**)

DashBoard

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Block diagram — BBG-1022-2FS

Path 1: De-serialize → Moving-Box Insertion / Dual-String Character Burn / Timecode Burn → Color Correction (+COLOR) → Audio Demux → Video / Ref → Framesync w/User H/V Offset / Pattern Gen / Extended DLY (+DLY) → Wings Insert Key/Fill (+KEYER) → Audio Mux Delay Offset / AES SRC / Output Routing → Serialize → Path 1 Audio De-Embed. Timecode Select/Processing, LTC I/O (+LTC). From Input Select: Wings, Key/Fill. Path 1 Emb Audio. Path 1 Audio Embed.

3G/HD/SD SDI In: A, B, C, D → Dual-Path RP168 Input Select Crosspoint. Path 1/2 Processed (Internal loop-back). CVBS In → Video ADC. GPIO Input Select/Status.

Path 1/2 Input Ref Extract → Ext Ref (Loop) → Ref Select ← Internal.

RCK Select (from Input Select) → Output Crosspoint → 1, 2, 3, 4 → 3G/HD/SD-SDI Path 1/2 Proc/RCK Out. → Video DAC → CVBS Out. From Path 1, 2 Audio De-Embed → 24-Bit DAC → AN-AUD Out (4-Ch). AES Tx → AES Out (16-Ch).

Trouble Slate Import/Insert (+T-SLATE) → To Path 1/Path 2 Framesync Raster Gen.

Path 1/2 Audio/Video/CC Status → Quality Event Detect (+QC): Audio Silence, Closed-Captioning Absence/Presence, Frozen/Blk/No Vid → Automated Event Actions: Email Alerts, GPO, I/O Routing Changes, User Preset Engage, Status via serial, IP.

Ethernet 10/100/1000 → DashBoard™ Monitor/Control.

AES In (16-Ch) → AES Rx → To Path 1, 2 Audio Embed. AN-AUD In (4-Ch) → 24-Bit ADC.

this color denotes option

Path 2: De-serialize → Moving-Box Insertion / Dual-String Character Burn / Timecode Burn → Color Correction (+COLOR) → Audio Demux → Video / Ref → Framesync w/User H/V Offset / Pattern Gen / Extended DLY (+DLY) → Wings Insert Key/Fill (+KEYER) → Audio Mux Delay Offset / AES SRC / Output Routing → Serialize → Path 2 Audio De-Embed. Timecode Select/Processing, LTC I/O (+LTC). From Input Select: Wings, Key/Fill. Path 2 Emb Audio. Path 2 Audio Embed.

BBG-1022-2FS

Rear Panel

12 VDC, ETHERNET, 12 VDC, REF LOOP

RCK/PROC OUT: 3, 1, 4, 2. SDI IN D, SDI IN C, SDI IN A. GPIO COMM, RLY BYP B, SDI IN B. -FS-B

AN-AUD: IN 1 (+, I, G), IN 2 (+, I, G), OUT 1 (+, G), OUT 2 (+, G). AES OUT 1, SDI OUT, AES IN 1, SDI IN. AES OUT 2, CVBS OUT, AES IN 2, CVBS IN. -FS-C

AN-AUD-IN: G − + (1), G − + (2). GPIO COMM. SDI OUT: 3A, 4B, 2B. AES I/O: 01, 12, 02, 13, 11, 03, 16, 14, 04, 15. 1A, SDI OUT, RLY BYP. SDI IN: C, A, B, D. -FS-D

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SPECIFICATIONS

Power

< 18 Watts. Power supplied by 12VDC AC adapter, universal input (included).

SDI Input/Outputs

Up to (4) 75Ω BNC inputs

Up to (4) 75Ω BNC outputs (selectable as processed SDI Path 1 or Path 2, or selected input reclocked)

SDI Formats Supported: SMPTE 259M, SMPTE 292M, SMPTE 424M

SDI Receive Cable Length: 3G/HD/SD: 120/180/320 m (Belden 1694A)

SDI Return Loss: >15 dB up to 1.485 GHz; >10 dB up to 2.970 GHz

SDI Alignment Jitter: 3G/HD/SD: < 0.3/0.2/0.2 UI

Timing Jitter: 3G/HD/SD: < 2.0/1.0/0.2 UI

Minimum Latency (frame sync disabled): SD: 127 pixels (9.4 us); 720p: 330 pixels (4.45 us); 1080i: 271 pixels (3.65 us); 1080p: 361 pixels (2.43 us)

CVBS Video Input/Outputs

(1) 75Ω BNC input

(1) 75Ω BNC output (selectable as Path 1 or Path 2 processed output). CVBS output functional only when selected path is carrying SD-SDI.

ADC resolution: 9-bit

Sampling frequency: 27 MHz (2x over-sampling)

Y/C separation: 4 line Adaptive Comb Filter

Freq. Response: ± 0.25 dB to 5.5 MHz

SNR: > 50 dB to 5.5 MHz (unweighted)

Differential Phase: < 1 degree

Differential Gain: < 1%

Nonlinearity < 1%

Discrete Audio Input/Outputs

AES-3id 75Ω inputs (8 pair (16-Ch) max)   AES-3id 75Ω outputs (8 pair (16-Ch) max)

Input AES SRC Range: 32 to 96 kHz

Balanced analog audio inputs (4-Ch max)

Balanced analog audio outputs (4-Ch max)

(I/O conforms to 0 dBFS = +24 dBu)

Analog Output Impedance: < 50 Ω

Analog Reference Level: -20 dBFS

Analog Nominal Level: +4 dBu

Analog Max Output Level: +24 dBu (0 dBFS)

Analog Freq. Response: ±0.2 dB (20 Hz to 20 kHz)

Analog SNR: 115 dB (A weighted)

Analog Analog THD+N: -96 dB (20 Hz to 10 kHz)

Analog Crosstalk: -106 dB (20 Hz to 20 kHz)

Frame Sync Audio/VIdeo Delay

Max offset: 20 frames

Latency (min): 1 frame

Option +DLY Delay (3G/HD/SD): >800 msec / >1580 msec / >9000 msec

User Audio Delay Offset from Video

Bulk delay control: -33 msec to +3000 msec.

Per-channel delay controls: -800 msec to +800 msec

Text Burn-In

(2) independent strings per path supported. Independent insertions controls for enable/disable and enable upon LOS. User controls for text size and H/V position.

GPIO/COMM

(2) GPI configurable to select input routing. (2) GPO configurable to invoke upon input selected. RS-232/485 comm port.

Control/Monitor Interface

Front panel network setup. DashBoard remote control via 10/100/1000 Ethernet port.

Frame Reference Input

Looping 2-BNC connection. SMPTE 170M/318M "Black Burst", SMPTE 274M/296M "Tri-Level"

Return Loss: >35 dB up to 5.75 MHz

Physical

Dimensions (WxHxD): 5.7 x 1.4 x 14.7 in (14.5 x 3.5 x 37.3 cm) Dimensions include connector projections.

Weight: 6 lb (2.8 kg)

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ORDERING INFORMATION

BBG-1022-2FS 3G/HD/SD-SDI Standalone Dual-Channel Frame Sync with Audio/Video Processing, AES/Analog Audio Embedding/De-Embedding and CVBS I/O available in the following rear-panel I/O configurations:

BBG-1022-2FS-B (4) 3G/HD/SD-SDI Input BNCs, (4) 3G/HD/SD-SDI Output BNCs, (1) 3G/HD/SDI Output BNC (with relay bypass failover), (1) GPIO/COMM RJ-45 connector

BBG-1022-2FS-C (1) 3G/HD/SD-SDI Input BNC, (1) CVBS Video In BNC, (2) AES In BNCs, (2) Balanced Analog Audio Inputs, (1) 3G/HD/SDI Output BNC, (1) CVBS Video Out BNC), (2) AES Out BNCs, (2) Balanced Analog Audio Outputs

BBG-1022-2FS-D-DIN (4) 3G/HD/SD-SDI Inputs, (2) Balanced Analog Audio In, (6) AES Inputs, (4) 3G/HD/SDI Outputs w/ (1) relay protect, (4) AES Outputs, GPIO/COMM (RJ-45 connector). (All coaxial connectors DIN 1.0/2.3)

BBG-1022-2FS-D-HDBNC (4) 3G/HD/SD-SDI Inputs, (2) Balanced Analog Audio In, (6) AES Inputs, (4) 3G/HD/SDI Outputs w/ (1) relay protect, (4) AES Outputs, GPIO/COMM (RJ-45 connector). (All coaxial connectors HD-BNC)

Options and Accessories:

+ANC Ancillary Data Processor Option

+COLOR Color Correction Option

+KEYER Key/Fill Keyer Option

+LTC Audio LTC I/O Option

+CQS Clean and Quiet Switching Option

+QC Quality Check Option

+TTS Text-To-Speech Option (Acapela Text-To-Speech from Acapela Group™. Fielded units must be returned to Cobalt for installation of speech library SD memory card onto host unit as well as software upload. Please contact Support for more information.)

+2L-SPAN Add Spanish-language upgrade (add-on to option +TTS; option +TTS required)

+EAS Emergency Alert System Text Crawl Generation Option

+DLY Extended Frame Sync Delay Option

+T-SLATE User Trouble Slate Graphic Import Option

+LOGO Logo Insertion Option

+SCTE104 SCTE 104 Insertion Option

+SCTE104-FAST Frame-Accurate SCTE 104 Trigger Insertion Option

BBG-1000-PS Redundant Power Supply Module

BBG-1000-TRAY 1RU Mounting Tray (supports 3 units)