BBG-1060-TG2-REF1

3G/HD/SD-SDI Standalone Dual Test Signal Generator with Moving Box Active Signal Indication and Bi-Level/Tri-Level Sync Out

Product Manual

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BBG1060TG2REF1-OM (V1.4)

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Congratulations on choosing the Cobalt® BBG-1060-TG2-REF1 3G/HD/SD-SDI Standalone Dual Test Signal Generator with Moving Box Active Signal Indication and Bi-Level/Tri-Level Sync Out.. The BBG-1060-TG2-REF1 is part of a full line of modular processing and conversion gear for broadcast TV environments. The Cobalt Digital Inc. line includes video decoders and encoders, audio embedders and de-embedders, distribution amplifiers, format converters, remote control systems and much more. Should you have questions pertaining to the installation or operation of your BBG-1060-TG2-REF1, please contact us at the contact information on the front cover.

Manual No.:	BBG1060TG2REF1-OM
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Applicable for Firmware Version (or greater):	2.056 or greater
Description of product/manual changes:	- Update manual for latest card functionality, including new standard features. (This firmware version has significant user interface changes versus prior firmware versions and the use of this new Product Manual is strongly recommended.) - Correction to manual of minor errata and consistency items.

Table of Contents

Chapter 1

Introduction

Overview

This manual provides installation and operating instructions for the BBG-1060-TG2-REF1 3G/HD/SD-SDI Standalone Dual Test Signal Generator with Moving Box Active Signal Indication and Bi-Level/Tri-Level Sync Out unit (also referred to herein as the BBG-1060-TG2-REF1).

This manual consists of the following chapters:

- **Chapter 1, "Introduction"** – Provides information about this manual and what is covered. Also provides general information regarding the BBG-1060-TG2-REF1.
- **Chapter 2, "Installation"** – Provides instructions for installing the BBG-1060-TG2-REF1 and setting up its network access.
- **Chapter 3, "Setup/Operating Instructions"** – Provides overviews of operating controls and instructions for using the BBG-1060-TG2-REF1.

This chapter contains the following information:

Cobalt Reference Guides

From the Cobalt® web home page, go to **Support>Reference Documents** for easy to use guides covering network remote control, device firmware updates, example processing UI setups and other topics.

Manual Conventions

In this manual, display messages and connectors are shown using the exact name shown on the BBG-1060-TG2-REF1 itself. Examples are provided below.

- Device display messages are shown like this:

  BBG-1060

- Connector names are shown like this: **SDI IN A**

In this manual, the terms below are applicable as follows:

- **BBG-1060-TG2-REF1** refers to the BBG-1060-TG2-REF1 3G/HD/SD-SDI Standalone Dual Test Signal Generator with Moving Box Active Signal Indication and Bi-Level/Tri-Level Sync Out unit.
- **Frame** refers to the HPF-9000, OG3-FR, 8321, or similar 20-slot frame that houses Cobalt® or other cards.
- **Device** and/or **Card** refers to a Cobalt® or other card.
- **System** and/or **Video System** refers to the mix of interconnected production and terminal equipment in which the BBG-1060-TG2-REF1 and other cards and devices operate.
- Functions and/or features that are available only as an option are denoted in this manual like this:

  Option

Warnings, Cautions, and Notes

Certain items in this manual are highlighted by special messages. The definitions are provided below.

Warnings

Warning messages indicate a possible hazard which, if not avoided, could result in personal injury or death.

Cautions

Caution messages indicate a problem or incorrect practice which, if not avoided, could result in improper operation or damage to the product.

Notes

Notes provide supplemental information to the accompanying text. Notes typically precede the text to which they apply.

Labeling Symbol Definitions

	Important note regarding product usage. Failure to observe may result in unexpected or incorrect operation.
	Electronic device or assembly is susceptible to damage from an ESD event. Handle only using appropriate ESD prevention practices. If ESD wrist strap is not available, handle card only by edges and avoid contact with any connectors or components.
	Symbol (WEEE 2002/96/EC) For product disposal, ensure the following: • Do not dispose of this product as unsorted municipal waste. • Collect this product separately. • Use collection and return systems available to you.

Safety and Regulatory Summary

Warnings

! WARNING ! **To reduce risk of electric shock do not remove line voltage service barrier cover on frame equipment containing an AC power supply. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**

Cautions

CAUTION **This device is intended for environmentally controlled use only in appropriate video terminal equipment operating environments.**

CAUTION **This device contains no user-serviceable components. Refer servicing to authorized personnel.**

CAUTION **This device is intended for use ONLY with specified power supplies. Power connection to unauthorized sources may cause product damage, unreliable operation, and invalidate warranty.**

CAUTION **The BBG-1060-TG2-REF1 FPGA is designed for a normal-range operating temperature around 85° C core temperature. Operation in severe conditions exceeding this limit for non-sustained usage are within device operating safe parameters, and can be allowed by setting this control to Disable. However, the disable (override) setting should be avoided under normal conditions to ensure maximum card protection.**

EMC Compliance Per Market

Market	Regulatory Standard or Code
United States of America	FCC "Code of Federal Regulations" Title 47 Part15, Subpart B, Class A
Canada	ICES-003
International	CISPR 24:2010 IEC 61000-4-2:2008 IEC 61000-4-3:2006 with A1:2007 and A2:2010 IEC 61000-4-4:2004 IEC 61000-4-6:2008 IEC 61000-6-3:2006 with A1:2010 CISPR 22:2008

BBG-1060-TG2-REF1 Functional Description

Figure 1-1 shows a functional block diagram of the BBG-1060-TG2-REF1. The BBG-1060-TG2-REF1 provides comprehensive test signal packages to test and validate downstream baseband SDI systems. Two independent generator blocks (**TG1**, **TG2**) can be set to offer dual test packages which can be simultaneously outputted or selectively fed to a single downstream path via a 2x4 output crosspoint.

In addition to numerous high-quality industry-standard test patterns and user static raster import, the BBG-1060-TG2-REF1 also provides ANC data generators that are designed to thoroughly check all standard ANC packages (including CEA 608/708 closed captioning, SMPTE 12M timecode, SMPTE 2020 HANC audio, and SMPTE 2010 SCTE 104 test packets). Custom DID/SDID packages can be added to test non-conventional or custom processing.

The BBG-1060-TG2-REF1 also provides AES and analog audio test tones (both using 24-bit data), and also provides waveform-based test data over its CVBS video output. A moving-box insertion can be enabled to serve as a dynamic raster confidence check. The BBG-1060-TG2-REF1 can use either of two frame references to provide an output that's synchronous with house ref, or use its internal ref timing to generate its own ref. A CVBS output offers bi-level/tri-level reference output, line 21 CEA 608 closed-captioning and VITC waveform test sequences. Audio LTC test sequences are available over embedded, AES, and analog audio as well as via an RS-485 serial port.

BBG-1060-TG2-REF1 Outputs

The BBG-1060-TG2-REF1 provides the following outputs:

- **3G/HD/SD-SDI IN (User Import)** – 3G/HD/SD-SDI input allows import (frame capture) of SDI input. This input can be routed either or both TSG **TG1** or **TG2**.
- **3G/HD/SD-SDI TG 1/2 OUT (1-4)** – four 3G/HD/SD-SDI outputs. Each output can be independently set to route the TSG **TG1** or **TG2** signal as its output.
- **REF/CVBS OUT –** CVBS coaxial analog video output; provides bi-level/tri-level ref, VITC waveform timecode, and CEA 608 line 21 closed-captioning data when an SD TSG output is selected.
- **AES OUT –** Multiple AES-3id ports which provide AES audio test signals such as tones or audio LTC. These outputs are timing-referenced to the selected TSG **TG1** or **TG2** signal; each AES test source output can be independently referenced to either of the **TG1** or **TG2**.
- **AN-AUD OUT –** Balanced analog audio de-embed test signal output which provide configurable tone outputs.
- **RS-485 LTC OUT –** RS-485 LTC timecode output. This output is correlated to either of the selected **TG1** or **TG2** generator blocks.

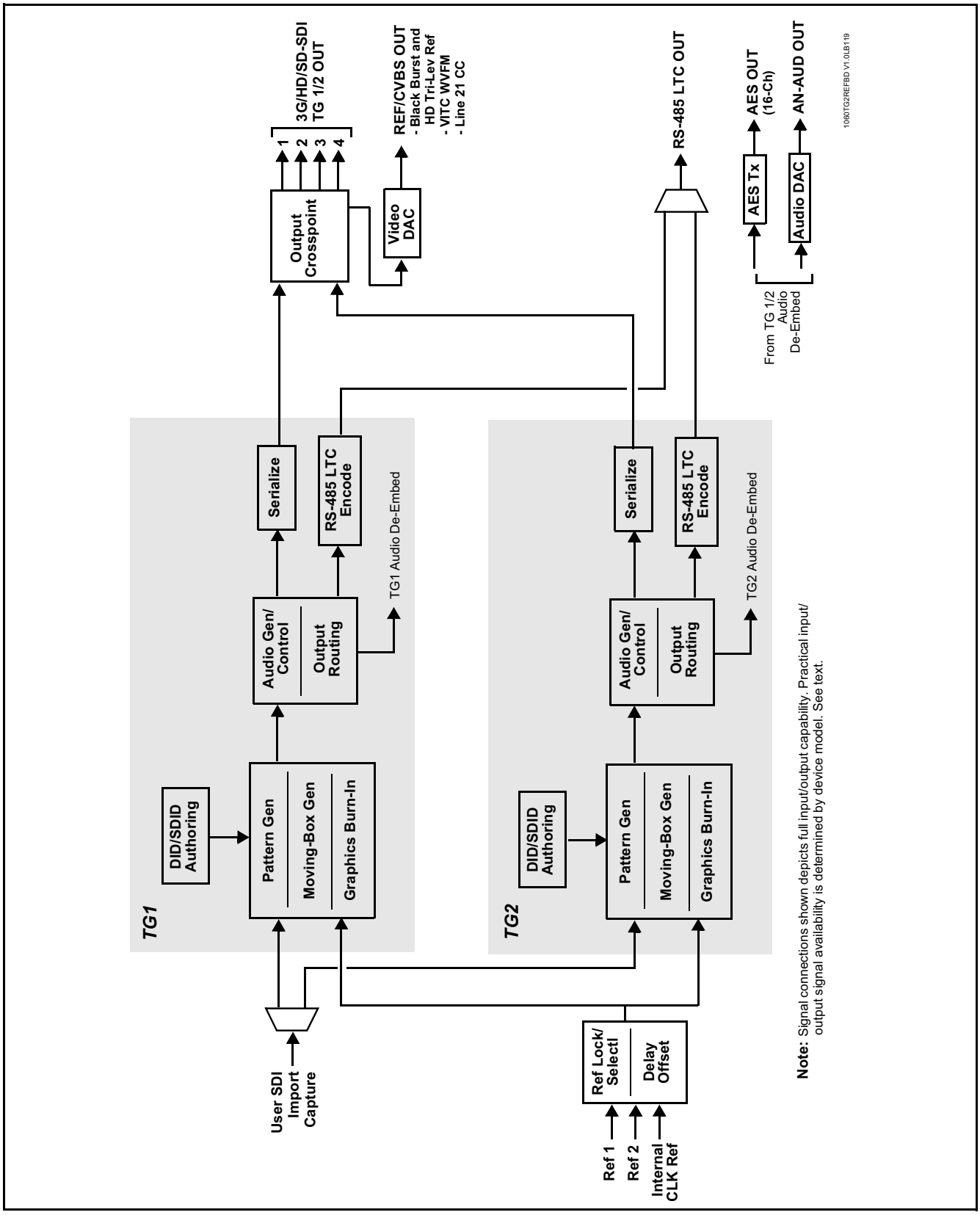

Figure 1-1 BBG-1060-TG2-REF1 Functional Block Diagram

Video TSG Description

The BBG-1060-TG2-REF1 features dual independent video TSG blocks, each capable of independent rasters, output format, and embedded ancillary data.

Ref Lock Function

This function allows either of the **TG1** or **TG2** generators to receive external ref lock, or a card internal ref lock source. Selectable failover allows alternate reference selection should the initial reference source become unavailable or invalid. This function also allows independent delay offsets for the **TG1** and **TG2** generators to be added or removed relative to the selected ref source.

Test Pattern Generator Function

Independent internal test pattern generators provides a selection of various standard patterns such as color bars, sweep patterns, and other technical patterns. A user-captured TSG selection allows a full video frame to captured and stored, available then as one of the pattern choices.

Character/Image Burn-in Functions

User text and timecode (as selected using the timecode function) can be burned into the output video. Burn-in attributes such as size, position, background, color, and opacity are user-configurable. Two discrete character burn strings can be inserted on output video, with each string inserted as static text and/or insert only upon LOS. A moving-box insertion can be enabled to serve as a dynamic raster confidence check.

Logo Insertion Function

This function provides for a graphic insertion onto the SDI processed output raster. The function allows for uploading a .png image graphic file to the card/device memory. (png files are converted to a .bin format using a web tool before uploading to the host card/device; this is described in the setup/operating instructions in Chapter 3.) Insertion enable/disable is then manually controlled using DashBoard.

ANC Generator Description

Timecode Generators

This function embeds packet-based timecode strings on the output video. Independent timecode insertion is provided for the **TG1** or **TG2** generators. A user entry dialog allows a running count (including fields for interlaced formats) in ATC_LTC and/or ATC_VITC for 3G/HD, and ATC_VITC or VITC waveform (with selectable odd/even field line number control) for SD SDI or CVBS inputs. Waveform VITC timecode can also be extracted from a reference input and used as the output timecode value.

LTC timecode can also be outputted over embedded or discrete AES or analog audio, and can be outputted as RS-485.

AFD Generators

This function embeds user-entered static AFD code strings on the output SDI video. Independent strings and formatting can be inserted for the **TG1** or **TG2** generators. The function also allows the selection/changing of the AFD code and ancillary data line number for the outputted AFD code.

SCTE104 Insertion

The SCTE104 function provides generation and insertion of SCTE 104 messages into baseband SDI. Message send can be triggered from automation GPI or other event action modes. The function can also execute card actions based on SCTE 104 messages received by the card, as well as send triggered SCTE 104 packets to other downstream systems.

The user interface is based on common SCTE 104 operations: Splice Start Normal, Splice Start Intermediate, Splice End Normal, Splice End Intermediate, and Splice Cancel (splice_request_data variants), offering full control of splice start, end, and cancel as well as pre-roll and break duration offsets.

CEA 608 Closed Captioning Insertion

Closed Captioning generator provides generation and insertion of CEA 608 Ch 1 -Ch 4 test messages to be inserted into VBI space for testing downstream systems ability to process and retain CEA closed captioning data. User text strings can be entered, and then set for display style (Paint On, Pop On, or Roll Up) messages.

Video Output Crosspoint

A four-output video matrix crosspoint allows independently applying either of the **TG1** or **TG2** generator SDI outputs to any of the four card discrete coaxial outputs (**SDI OUT 1** thru **SDI OUT 4**). For an SD output, a CVBS coaxial output is available as a processed video output.

De-Embed Audio Processor Description

The audio processor operates as an internal audio router that selects embedded audio channel content from either **TG1** or **TG2** for use as discrete audio channels over up to 16 AES channels and/or four balanced analog output channels. Any of the 32 total **TG1** and **TG2** embedded channels can be outputted over any of AES or analog audio output channels.

Control and Data Input/Output Interfaces

Serial (COMM) Ports

The BBG-1060-TG2-REF1 is equipped with a 3-wire serial port (**RS-485**). The port provides for RS-485 LTC I/O and can be configured as RS-232 Tx/Rx or RS-485 non-duplexed Tx or Rx

User Control Interface

BBG-1060-TG2-REF1 uses an HTML5 internal web server for control/ monitoring communication, which allows control via a web interface with no special or unique application on the client device. Connection to the device to the network media connection is via a standard 10/100/1000 RJ-45 Ethernet connection. The device can also be controlled using DashBoard™ remote control, where it appears as a frame connection.

Technical Specifications

Table 1-1 lists the technical specifications for the BBG-1060-TG2-REF1 3G/HD/SD-SDI Standalone Dual Test Signal Generator with Moving Box Active Signal Indication and Bi-Level/Tri-Level Sync Out unit.

Table 1-1 Technical Specifications

Item	Characteristic
Part number, nomenclature	• BBG-1060-TG2-REF1 3G/HD/SD-SDI Standalone Dual Test Signal Generator with Moving Box Active Signal Indication and Bi-Level/Tri-Level Sync Out
Power consumption	< 18 Watts maximum. Power provided by included AC adapter; 100-240 VAC, 50/60 Hz. Second DC power connection allows power redundancy using second (optional) AC adapter.
Installation Density	Up to 3 units per 1RU space
Environmental: Operating temperature: Relative humidity (operating or storage): Dimensions (WxHxD): Weight:	 32° – 104° F (0° – 40° C) < 95%, non-condensing 5.7 x 1.4 x 14.7 in (14.5 x 3.5 x 37.3 cm) Dimensions include connector projections. 6 lb (2.8 kg)
Ethernet communication	10/100/1000 Mbps Ethernet with Auto-MDIX via HTML5 web interface
Front-Panel Controls and Indicators	Backlit LCD display and menu navigation keys. Display and controls provide unit status display and full control as an alternate to web GUI control.
SDI Input/Outputs	(1) 75Ω BNC input (4) 75Ω BNC outputs SDI Formats Supported: SMPTE 259M, SMPTE 292M, SMPTE 424M 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 Return Loss: > 15 dB at 5 MHz – 270 MHz Signal Level: 800 mV ± 10% DC Offset: 0 V ± 50 mV
CVBS Video Output	(1) 75Ω BNC output. CVBS output functional only when selected path is carrying SD-SDI.

Table 1-1 Technical Specifications — continued

Item	Characteristic
Discrete Audio Outputs	AES-3id 75Ω outputs (8 pair (16-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 THD+N: -96 dB (20 Hz to 10 kHz) Analog Crosstalk: -106 dB (20 Hz to 20 kHz)
Timecode Insertion/Burn-In	Burn-in and embedded video output timecode selected via user controls from input video SMPTE embedded timecode and/or audio LTC. Burn-in enable/disable user controls. Configurable for burn-in string of seconds, seconds:frames, seconds:frames:field. User controls for text size and H/V position.
Text Burn-In	(2) independent strings supported. Independent insertions controls for enable/disable and enable upon LOS. User controls for text size and H/V position.
User Audio Delay Offset from Video	Bulk delay control: -33 msec to +3000 msec Per-channel delay controls: -800 msec to +800 msec
Control/Monitor Interface	HTML5 web server/interface via rear-panel 10/100/1000 Ethernet port
Frame Reference Input	Looping 2-BNC connection. SMPTE 170M/318M “Black Burst”, SMPTE 274M/296M Return Loss: >35 dB up to 5.75 MHz
Redundant (or spare) AC power supply	BBG-1000-PS

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 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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- Upcoming trade show information

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Chapter 2

Installation

Overview

This chapter contains the following information:

Installing the BBG-1060-TG2-REF1

Note:
- Where BBG-1060-TG2-REF1 is to be installed on a mounting plate (or regular table or desk surface) **without** optional frame Mounting Tray BBG-1000-TRAY, affix four adhesive-backed rubber feet (supplied) to the bottom of BBG-1060-TG2-REF1 in locations marked with stamped “x”. If feet are not affixed, chassis bottom cooling vents will be obscured.
- Where BBG-1060-TG2-REF1 is to be installed **with** optional frame Mounting Tray BBG-1000-TRAY, **do not** affix adhesive-backed feet.

Installing Using BBG-1000-TRAY Optional Mounting Tray

BBG-1000-TRAY allows up to three BBG-1060-TG2-REF1 to be mounted and securely attached to a 1 RU tray that fits into a standard EIA 19” rack mounting location. Install BBG-1060-TG2-REF1 unit into tray as described and shown here.

1. If installing BBG-1060-TG2-REF1 using optional frame Mounting Tray BBG-1000-TRAY, install BBG-1060-TG2-REF1 in tray as shown in Figure 2-1.

2. Connect the input and output cables as shown in Figure 2-3.

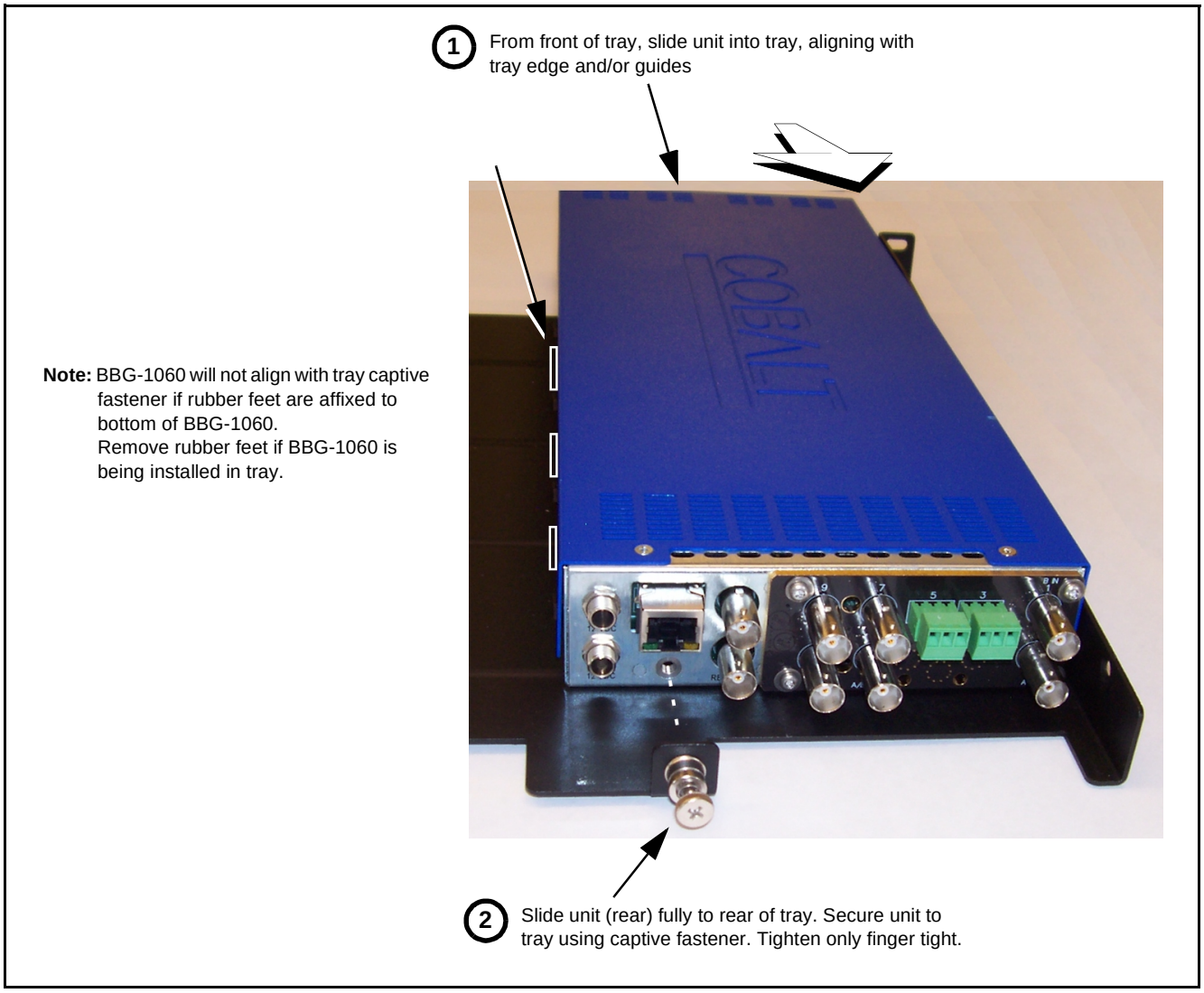


Figure 2-1 Mounting BBG-1060-TG2-REF1 Using Frame Mounting Tray

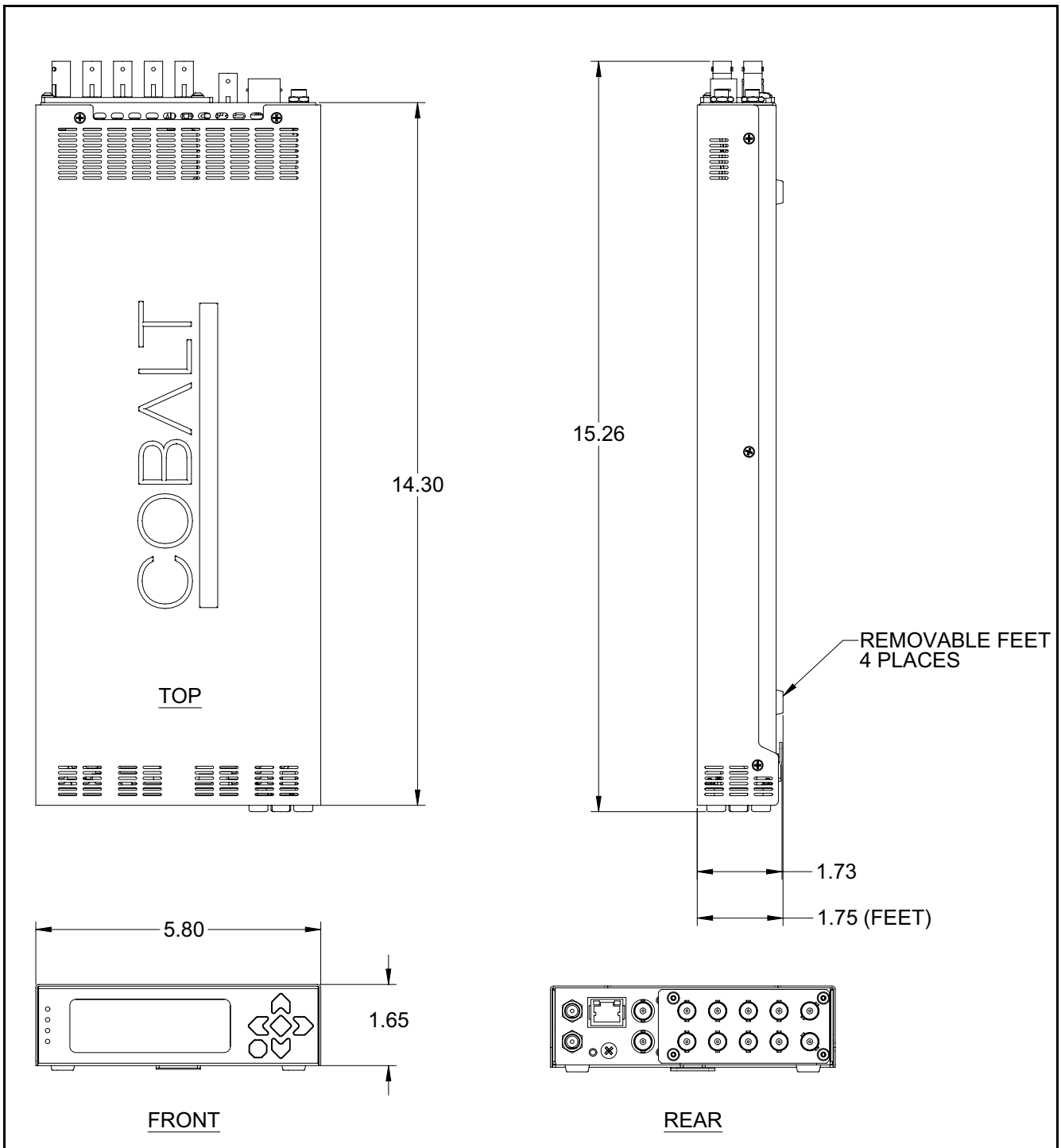
BBG-1060-TG2-REF1 Unit Dimensions

Figure 2-2 shows the BBG-1060-TG2-REF1 physical dimensions and mounting details for cases where BBG-1060-TG2-REF1 will be installed in a location not using the optional **BBG-1000-TRAY** mounting tray.

Rear Panel Connections

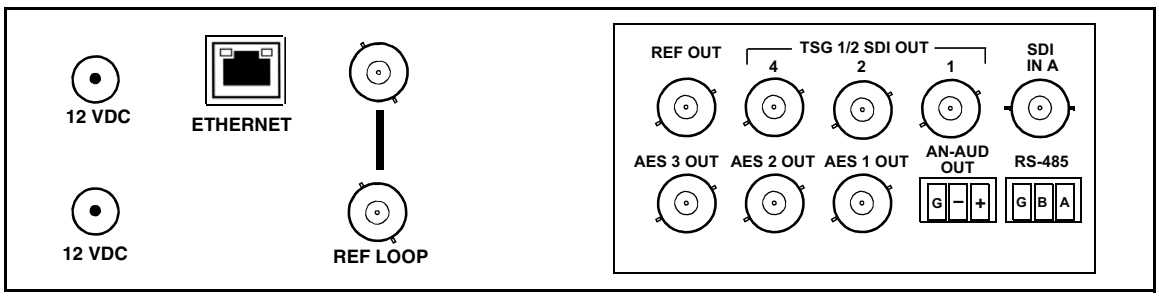
Perform rear panel cable connections as shown in Figure 2-3.

Note:
- The BBG-1060-TG2-REF1 BNC inputs are internally 75-ohm terminated. It is not necessary to terminate unused BNC video inputs or outputs.
- External frame sync reference signal (if used) must be terminated if a looping (daisy-chain) connection is not used. Unterminated reference connection may result in unstable reference operation.



Notes: 1. All dimensions in inches.
2. If BBG-1060 is mounted on flat surface, either rubber feet must be installed, or mounting surface must be open to mate with cooling vents on bottom of BBG-1060 chassis.

Figure 2-2 BBG-1060-TG2-REF1 Dimensional Details



Connector	Function
12 VDC – ⏚ +	Dual DC power IN connectors (diode-isolated). Single AC adapter (supplied) can be connected to either connector. Dual adapters can be connected to provide power redundancy.
10/100/1000 ETHERNET	Gigabit Ethernet control/monitoring connection. Communication activity status is shown by integral status LEDs.
REF LOOP	REF LOOP connectors are NC for these models
Signal Connectors (see diagram for connector assortments per model)	
SDI IN	3G/HD/SD-SDI video input BNC (user capture import)
SDI TSG	3G/HD/SD-SDI video output BNCs
REF OUT	CVBS analog video/ref output BNC
AN-AUD OUT	Analog balanced audio inputs (see diagram)
AES OUT	AES output BNCs (see diagram)
RS-485	3-pin connector for RS-485 LTC output

Figure 2-3 BBG-1060-TG2-REF1 Rear Panel Connectors

Chapter 3

Setup/Operating Instructions

Overview

This chapter contains the following information:

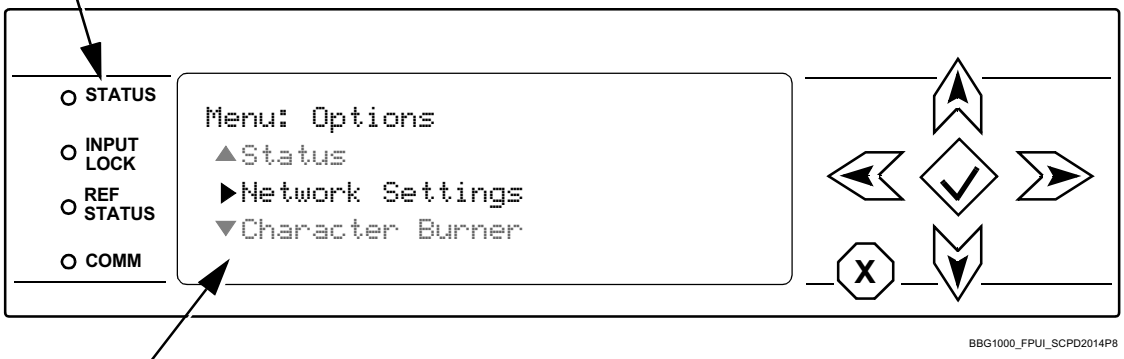
Perform the setup procedures here in the sequence specified. All procedures equally apply to all models unless otherwise noted.

Note: All instructions here assume BBG-1060-TG2-REF1 is physically connected to the control physical network as described in Chapter 2. Installation.

BBG-1060-TG2-REF1 Front Panel Display and Menu-Accessed Control

Figure 3-1 shows and describes the BBG-1060-TG2-REF1 front panel displays and menu-accessed user interface controls. Initial network setup is performed using these controls.

- **STATUS** LED illuminated green shows unit power is OK and unit is functional.
- **INPUT LOCK** LED illuminated green shows at least one video input is locked to video.
- **REF STATUS** LED illuminated green shows valid reference is being received.
- **COMM** LED illuminated green shows Ethernet connection is OK.



BBG1000_FPUI_SCPD2014P8

Alphanumeric display shows configuration items, and shows and allows changes of settings when a menu item is accessed.

▲ and ▼ arrows denote scroll up or down to access the menu item.

▶ arrows denotes a menu item is accessed to be selected (in the example above, **Network Settings**).

Press the ✓ button to now access and enter the menu item. When this button is pressed, the selected menu item is displayed, along with its sub-menus.

In this example showing the Network Settings menu, `Menu: Network Settings` as menu item is displayed (indicating this is the actively selected menu item) and its sub-menus are now displayed:

```
Menu: Network Settings
▶ IP: 10.99.11.162
▼ Netmask: 255.255.255.0
▼ Gateway: 10.99.11.1
```

In this example, with ▶ pre-selecting the IP: sub-menu, pressing the ✓ button again opens the IP: sub-menu.

```
IP
▲
010.099.011.162
▼
```

The carets above and below a character indicate this character is ready for editing. Use the ▼ and ▲ buttons to decrement or increment the value.

Use the ≪ and ≫ buttons to navigate to other characters.

To exit a sub-menu or a menu, press the X button. This locks in any changes and proceeds to the last-selected sub-menu or menu item. Repeatedly press the button to step up through sub-menus and then to other menus. Access other menu items using the ▼ and ▲ buttons.

The display backlight automatically brightens with any navigation arrow activity, and then goes dim after a few moments.

Figure 3-1 BBG-1060-TG2-REF1 Front Panel Display and Menu Controls

Connecting BBG-1060-TG2-REF1 To Your Network

BBG-1060-TG2-REF1 ships with network protocol set to DHCP and populates its address with an addressed allocated by your DHCP server. If your network does not have a DHCP server, the BBG-1060-TG2-REF1 address field will be blank, and a static address must then be assigned. All initial network settings are performed using the Front Panel Display menu-accessed control (as described on the previous page). Refer to this page for instructions of using the front-panel menu navigation.

Access the Network Settings menu and configure network settings as follows:

Connecting BBG-1060-TG2-REF1 To Network

1. Power-up BBG-1060-TG2-REF1 and connect Ethernet cable connection to media. Wait for BBG-1060-TG2-REF1 to complete booting.
When **`Product: BBG-1060`** ... is displayed, device is ready for configuration.

2. Press ✓ and access the **`Network Settings`** menu. Current network settings are displayed (as configured by host DHCP server).
Note: It is recommended to now change the settings to use a static IP address of your choice. The following steps describe using a static IP address.

3. In **`Network Settings > Mode`**, change setting to **`Mode: Static`**.

4. Configure the following fields as desired and appropriate for your network connection (examples shown below).

```
Menu: Network Settings
  IP: 10.99.16.105
  Netmask: 255.255.255.0
  Gateway: 10.99.16.1
  Mode: Static
```

5. Press X to commit changes and exit the setup menu.
Note: Current IP address of BBG-1060-TG2-REF1 can now be checked from the front panel by accessing this at any point.

6. At this point, BBG-1060-TG2-REF1 can now be accessed with a web browser pointing to the configured address. Browse to the configured address and check connectivity.

Web browser pointing to configured address displays BBG-1060-TG2-REF1

Finding a BBG-1060-TG2-REF1 Device in DashBoard

(See Figure 3-2) If BBG-1060-TG2-REF1 is configured with an address within a network also available via DashBoard, a BBG-1060-TG2-REF1 device appears as a frame entity in the DashBoard Basic Tree View.

Note: BBG-1060-TG2-REF1 DashBoard remote control is also available by opening the device in DashBoard similar to opening an openGear® card.

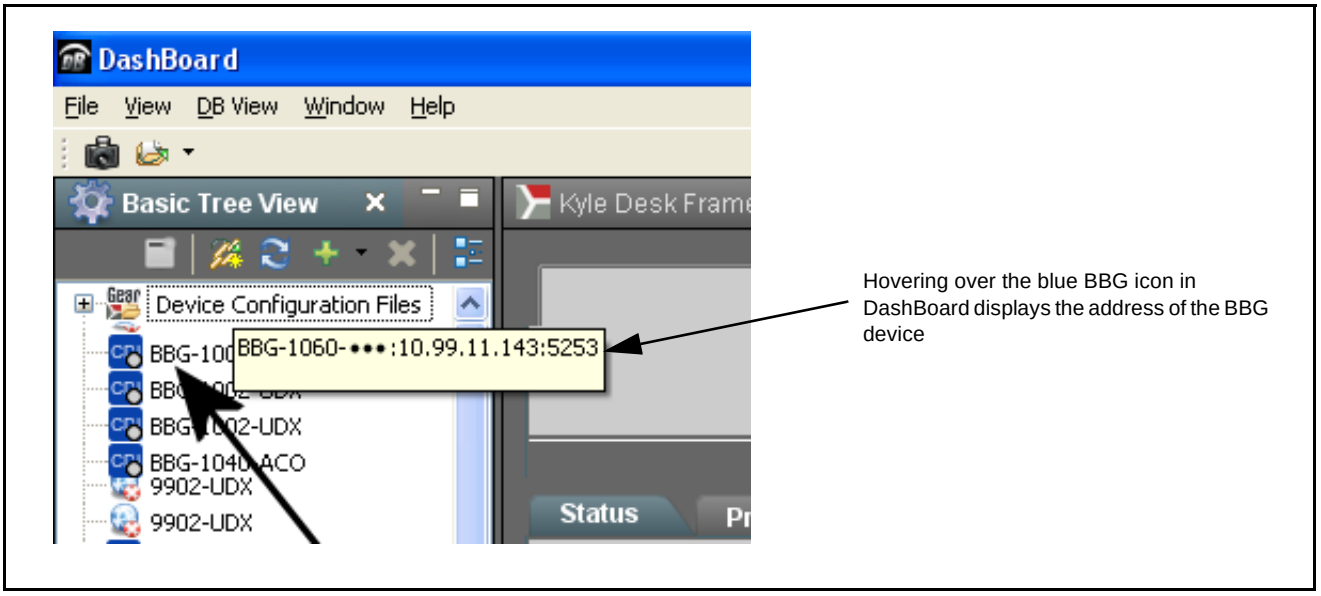


Figure 3-2 Finding BBG-1060-TG2-REF1 Using DashBoard

Control and Display Descriptions

This section describes the web user interface controls for using the BBG-1060-TG2-REF1.

The format in which the BBG-1060-TG2-REF1 functional controls appear follows a general arrangement of Function Submenus under which related controls can be accessed (as described in Function Submenu/Parameter Submenu Overview below).

Function Submenu/Parameter Submenu Overview

The functions and related parameters available on the BBG-1060-TG2-REF1 device are organized into function **menus**, which consist of parameter groups as shown below.

Figure 3-3 shows how the BBG-1060-TG2-REF1 device and its menus are organized, and also provides an overview of how navigation is performed between devices, function menus, and parameters.

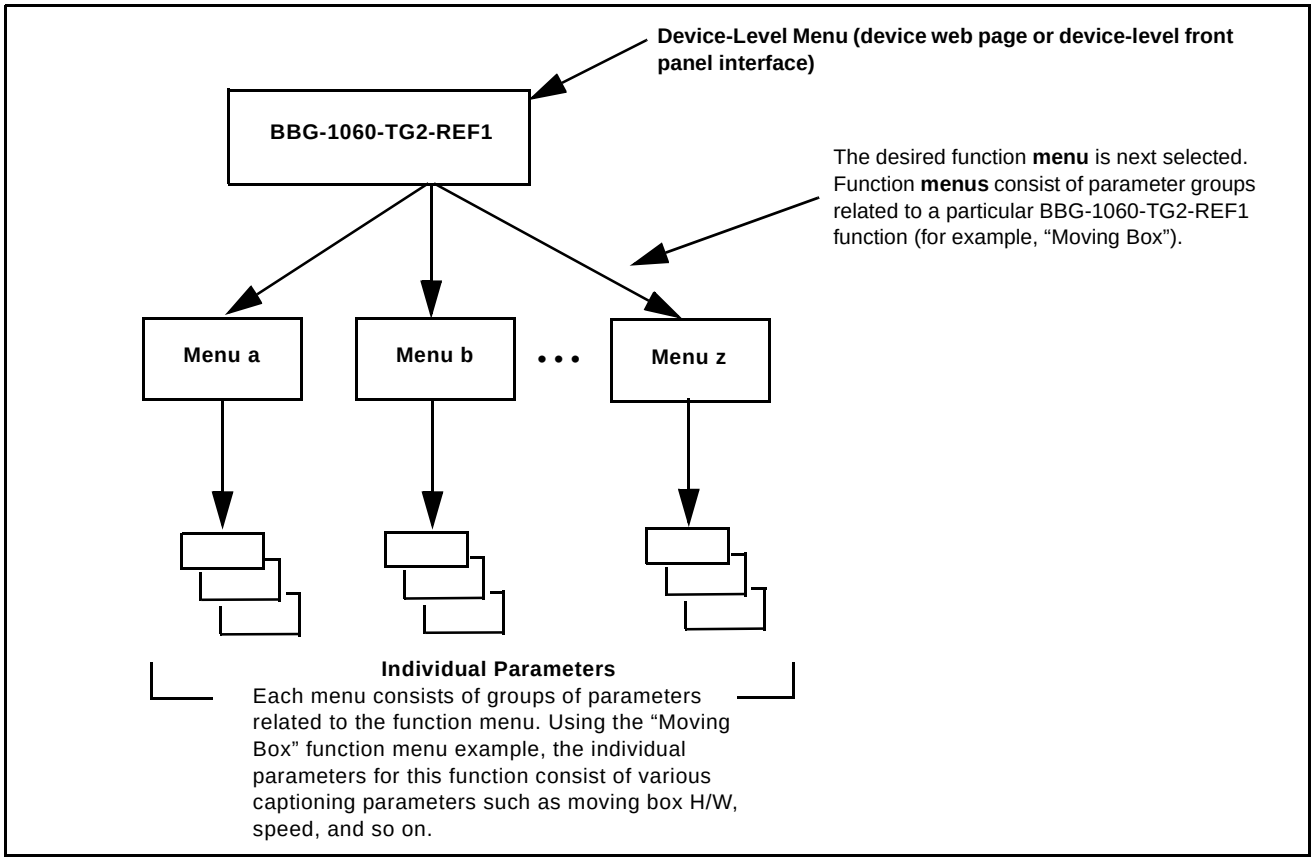
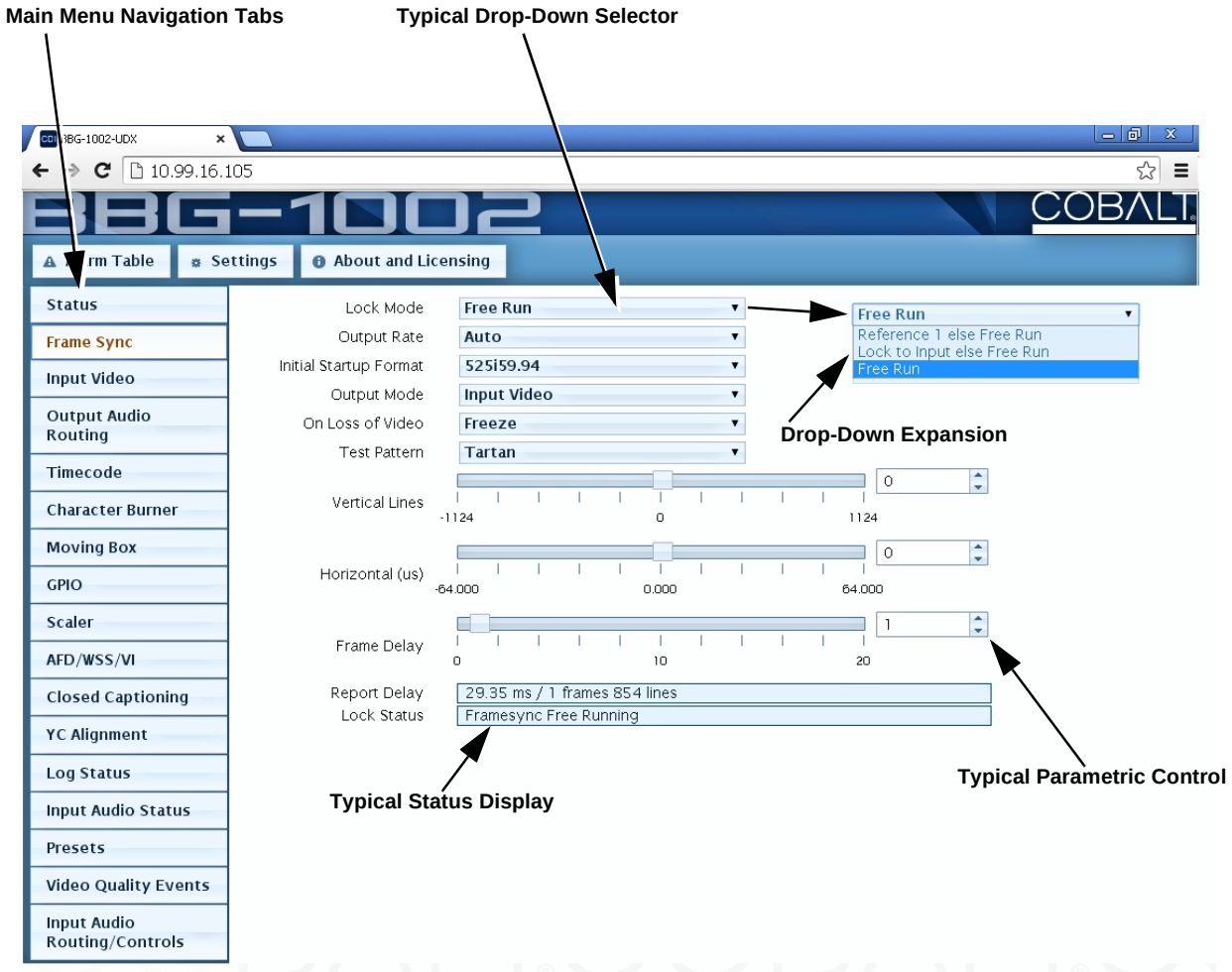


Figure 3-3 Function Submenu/Parameter Submenu Overview

Web User Interface

(See Figure 3-4.) The device function menu is organized using main menu navigation tabs which appear on the left side of any pane regardless of the currently displayed pane. When a menu tab is selected, each parametric control or selection list item associated with the function is displayed. Scalar (numeric) parametric values can then be adjusted as desired using the GUI slider controls. Items in a list can then be selected using GUI drop-down lists.



In this example, the **Frame Sync** main menu tab is selected, with the overall pane now showing all sub-menu items related to the framesync function.

Clicking another main menu tab immediately displays the pane related to the selected main menu tab.

Figure 3-4 Typical Web UI Display and Controls

Display Theme

(See Figure 3-5.) The BBG-1060-TG2-REF1 user interface theme selection offers light and dark themes suited for various users and environments.

Light – this is the theme shown in this manual and is useful for normal ambient light environments such as offices.

Dark – the dark theme is suited for low-light environments.

Figure 3-5 Typical Web UI Display Themes

Checking BBG-1060-TG2-REF1 Device Information

The operating status and software version the BBG-1060-TG2-REF1 device can be checked by clicking the **Status** main menu tab. Figure 3-6 shows and describes the BBG-1060-TG2-REF1 device information status display.

Note: Proper operating status is denoted by green icons for the status indicators shown in Figure 3-6. Yellow or red icons respectively indicate an alert or failure condition. Refer to Troubleshooting (p. 3-53) for corrective action.

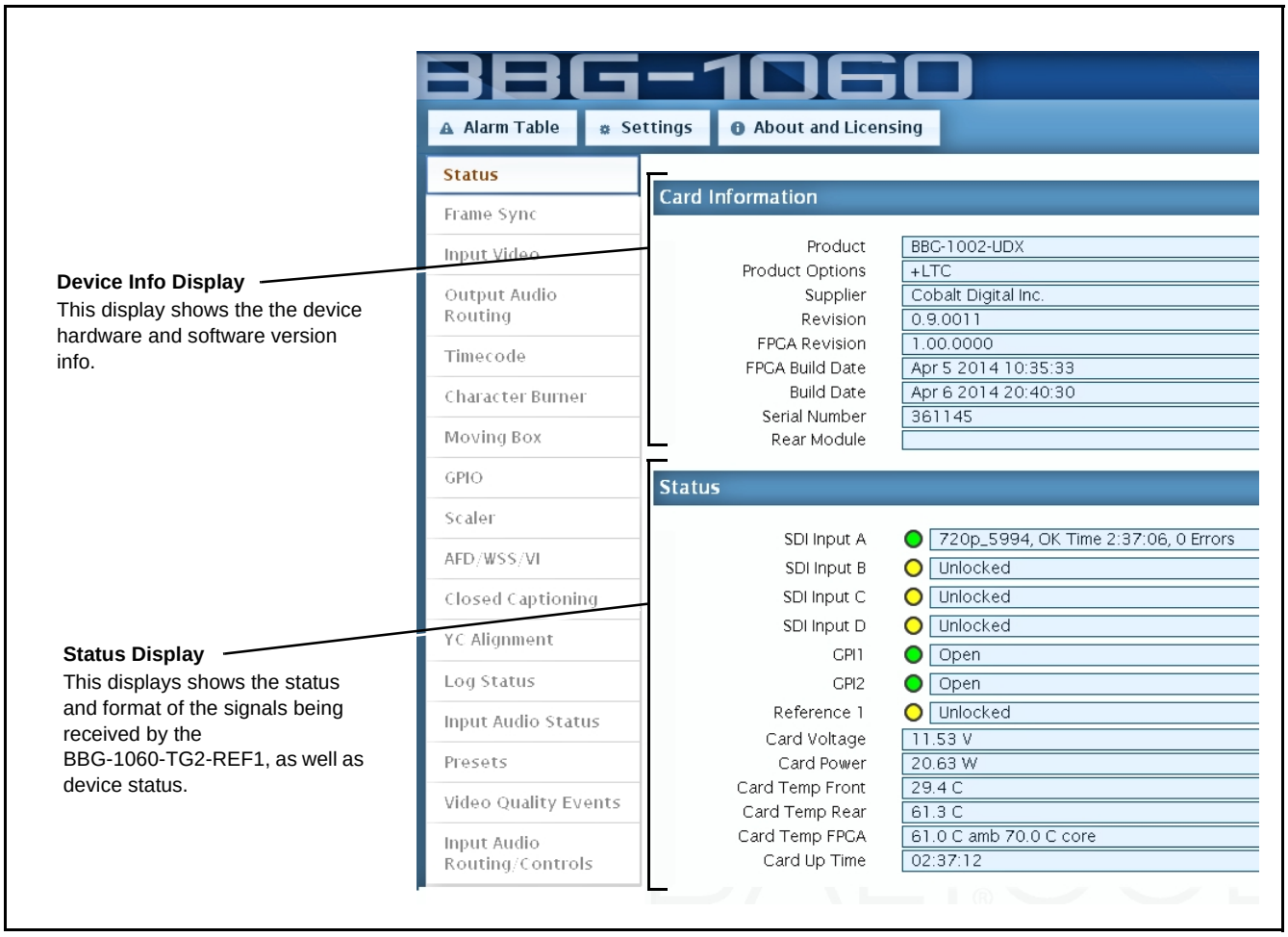


Figure 3-6 BBG-1060-TG2-REF1 Device Info/Status Utility

Ancillary Data Line Number Locations and Ranges

Table 3-1 lists typical default output video VANC line number locations for various ancillary data items that may be passed or handled by the device.

Table 3-1 Typical Ancillary Data Line Number Locations/Ranges

Item	Default Line No. / Range	
	SD	HD
AFD	12 (Note 2)	9 (Note 2)
ATC_VITC	13 (Note 2)	9/8 (Note 2)
ATC_LTC	—	10 (Note 2)
Dolby® Metadata	13 (Note 2)	13 (Note 2)
SDI VITC Waveform	14/16 (Note 2)	—
Closed Captioning	21 (locked)	10 (Note 2)

Notes:

1. The device does not check for conflicts on a given line number. Make certain the selected line is available and carrying no other data.
2. While range indicated by drop-down list on GUI may allow a particular range of choices, the actual range is automatically clamped (limited) to certain ranges to prevent inadvertent conflict with active picture area depending on video format. Limiting ranges for various output formats are as follows:

Format	Line No. Limiting	Format	Line No. Limiting	Format	Line No. Limiting
525i	12-19	720p	9-25	1080p	9-41
625i	9-22	1080i	9-20		

Because line number allocation is not standardized for all ancillary items, consideration should be given to all items when performing set-ups. Figure 3-7 shows an example of improper and corrected VANC allocation within an HD-SDI stream.

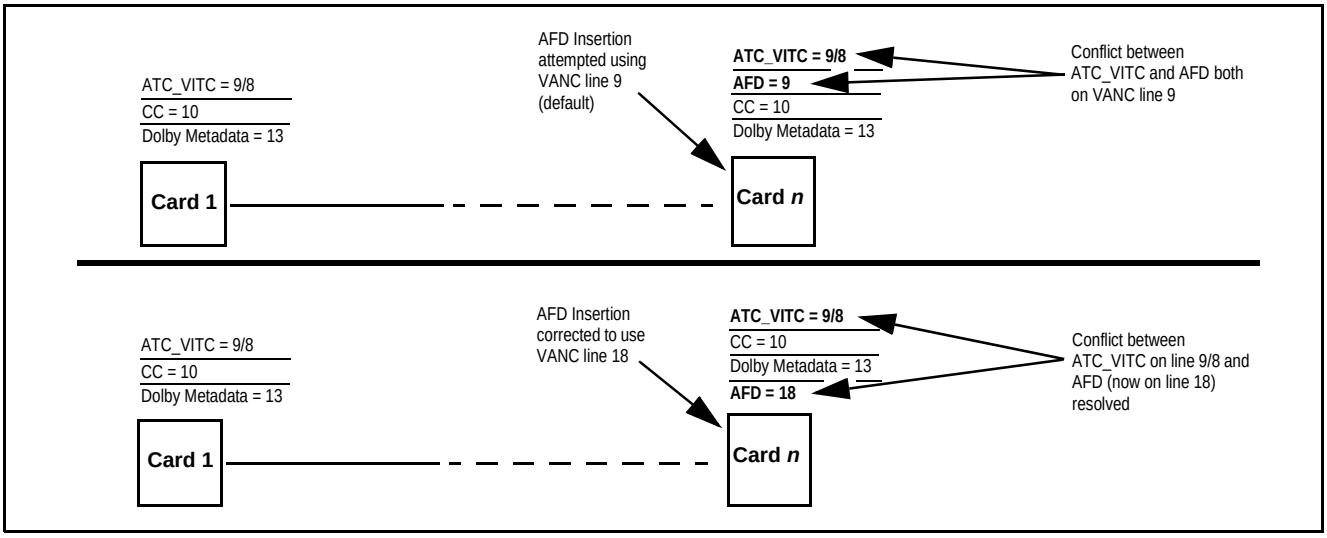


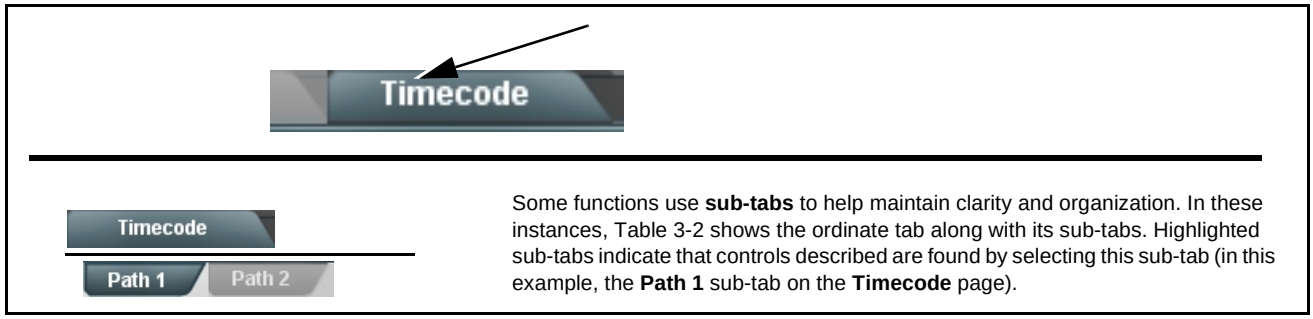
Figure 3-7 Example VANC Line Number Allocation Example

BBG-1060-TG2-REF1 Function Menu List and Descriptions

Table 3-2 individually lists and describes each BBG-1060-TG2-REF1 function menu item and its related list selections, controls, and parameters. Where helpful, examples showing usage of a function are also provided.

Note: User interface depictions here may show DashBoard UI. Web UI is similar.

On the web GUI itself and in Table 3-2, the function menu items are organized using main menu tabs as shown below.



Some functions use **sub-tabs** to help maintain clarity and organization. In these instances, Table 3-2 shows the ordinate tab along with its sub-tabs. Highlighted sub-tabs indicate that controls described are found by selecting this sub-tab (in this example, the **Path 1** sub-tab on the **Timecode** page).

The table below provides a quick-reference to the page numbers where each function menu item can be found.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List

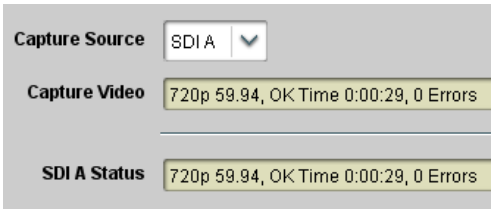
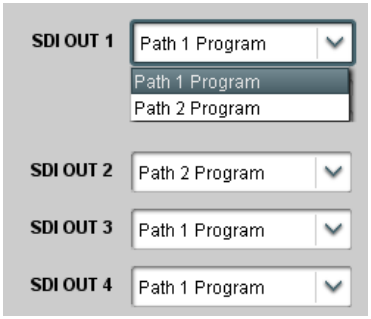
Input Video	Allows import of user video (frame capture) as a test material source.
• Input Video Source/Capture Status 	Shows status of SDI input used for frame capture, and the status of the captured video. **Note:** • Although a Capture Source drop-down selector is present, the device uses only **SDI IN A** as a capture source. • Activating a frame capture is performed using the Capture Pattern control on the SDI Output tab. See User Frame Capture Control on page 3-14 for more information.
Output Video	Allows selection of each of the four SDI outputs as test Program 1 or Program 2.
• SDI Output Video Crosspoint 	For each SDI output port supported by the device, provides a crosspoint for routing test generator Path 1 or Path 2 outputs.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

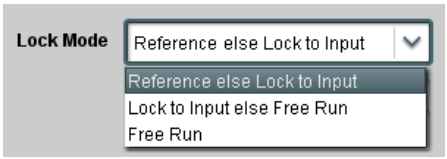
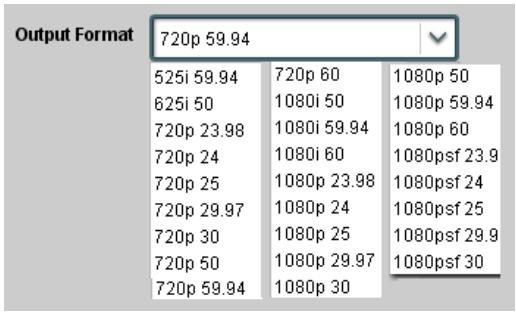
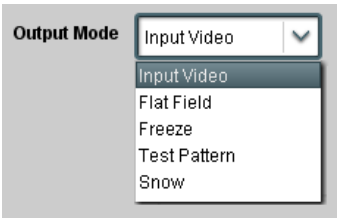
SDI Output	Provides controls for ref lock mode, output format, and test pattern select. Also provides controls H/V offset and user video frame capture from input video.
Note: SDI Output tab has identical independent controls for both Path 1 and Path 2 using the **Path 1 / Path 2** sub-tabs. Therefore, only the **Path 1** controls are shown here. Set controls for other path using the respective sub-tab.	
• **Output Lock Mode Select** 	Selects lock to reference functions from the choices shown and described below. • **Lock to Reference:** Output video is locked to external reference received on the device **REF LOOP** input, else input. • **Lock to Input A:** Uses Input program video input video signal as the reference standard, else free-run. • **Free Run:** Quadrant inputs and output video is locked to the card's internal clock. Output video is **not** locked to external reference. **Note:** Lock to reference provides the most stable operation, and is preferred where available. In this case, source video should also be locked to the same reference.
• **Output Format Selector** 	Sets card SDI output to formats as shown.
• **Program Video Output Mode Select** 	Selects card program video output mode from the choices shown to the left and described below. • **Input Video** – card outputs captured input program video frame (see Capture Pattern below) • **Flat Field** – card outputs flat field. • **Freeze** – card outputs last input video frame having valid SAV and EAV codes. • **Test Pattern** – card outputs standard technical test pattern (pattern is selected using the Pattern drop-down described below). • **Snow** – card outputs random-generation snow multi-color pattern.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

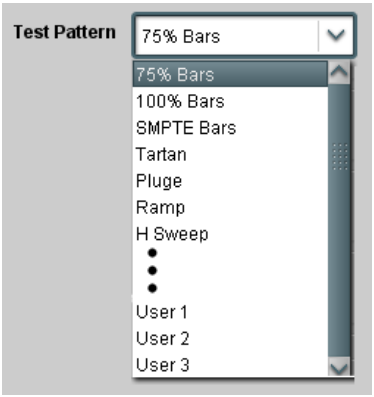
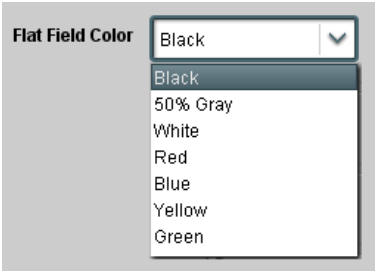
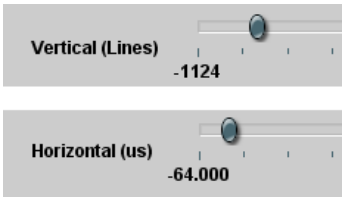
SDI Output	(continued)
• **Test Pattern Select** 	Provides a choice of standard technical patterns, or up to three user captures (see below).
• **Flat Field Color Select** 	Where **Flat Field** is selected for **Output Mode**, provides a choice of flat field colors.
• **Output Video Reference Offset Controls** 	Provides the following controls for offsetting the output video from the reference: • **Vertical (Lines)** – sets vertical delay (in number of lines of **output video**) between the output video and the frame sync reference. (Positive values provide delay; negative values provide advance) (Range is -1124 thru 1124 lines; null = 0 lines.) • **Horizontal (µs)** – sets horizontal delay (in µs of **output video**) between the output video and the frame sync reference. (Positive values provide delay; negative values provide advance) (Range is -64 thru 64 µsec; null = 0.000 µsec.)

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

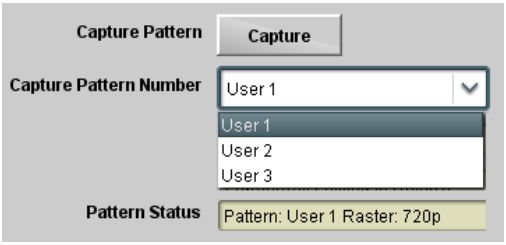
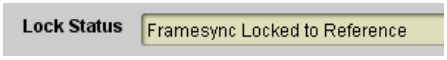
SDI Output	**(continued)**
• **User Frame Capture Control** 	Allows up to three discrete user frame captures from input video. When captured, these sources can be used for custom output test video patterns using the Test Pattern drop-down selector above. To use the Capture tool: **1.** With desired path selected, Set **Output Mode** to **Input Video**. **2.** Set **Capture Pattern Number** to the user space you want the capture stored in (i.e., User 1, 2, or 3). **3.** Press **Capture Pattern** when desired frame to be captured is present. The frame is now captured. The user capture frame can now be selected for static use by selecting User 1 thru User 3 in the Test Pattern select drop-down. **Note:** Because this model does not provide scaling of user captures to other formats, the format of the incoming SDI used for a capture should be that of the intended output format whenever a capture is to be used. For example, if the card is to provide a 720p 59.94 capture at a later time, set card **Output Format** to 720p 59.94 and furthermore, when frame is captured, the incoming video should also be 720p 59.94.
• **Ref Lock Status Display** 	Displays the current ref lock status and reference source.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

Logo Insertion	Provides controls for uploading logo/"bug" user graphics to the card and enabling insertion when desired.

Uploading Your Logo or Trouble Slate Graphic Images to Cobalt Card or BBG-1000 Device

A user memory area for images is reserved in the card/device. A standard .png file is converted to a .bin file which is uploaded to the card/device, where the .bin then provides the logo graphic used by the card/device. The conversion consists of an online tool that takes in a .png and outputs the image .bin file which is then uploaded to the card/device as described in the steps below.

Note: • Your file **must** be a **.png** file with a .png extension. The filename should not contain spaces.
- No scaling is applied or available using the generator tool. (For example, if a 100 x 100 pixel image is uploaded to the tool, the image overlay will also be 100 x 100 pixel regardless of program video format or raster dimensions.)
- Transparency aspects in your native file are preserved in the generator conversion.

Use the conversion tool as described below.

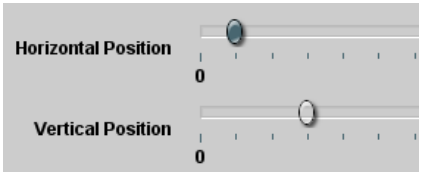
1. With your .png sized as desired for insertion, go to **http://a.cdi-eng.com:55080/cgi-bin/image_upload.py**

2. Browse to your file. A prompt will appear to save the generated .bin file. Select Save (or Save As) to store the generated file in your desired folder. Close the tool when done.

3. In DashBoard on the card/device page, click **Upload** to upload the image file to the card/device. Follow the prompts to browse to and upload the file. The image is now ready to be used by the card/device. Set **Graphic Overlay** to **Enabled** to activate insertion.

Note: **Logo** tab has identical independent controls for logo enable and insertion for both Path 1 and Path 2 using the **Path 1 / Path 2** sub-tabs.

• Logo Positioning Controls



Sets logo burn-in position as follows:

- **Horizontal Position** sets horizontal position (in percentage of offset from left of image area, left justified). (Range is 0 thru 100)
- **Vertical Position** sets vertical position (in percentage of offset from top of image area, top justified). (Range is 0 thru 100)

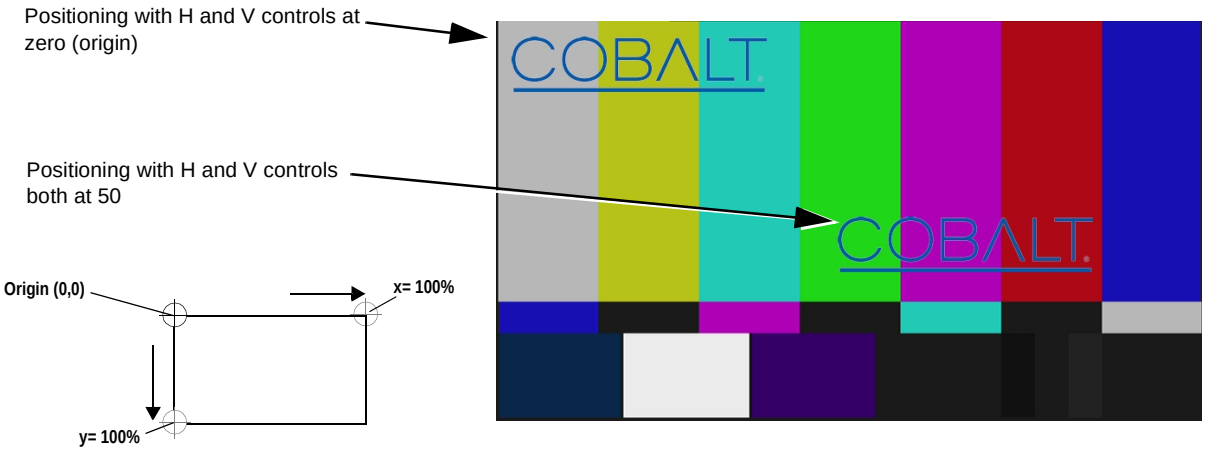


Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

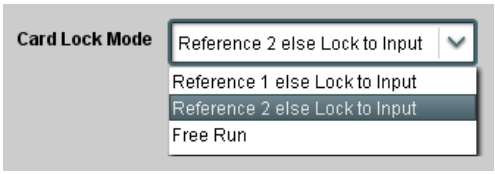
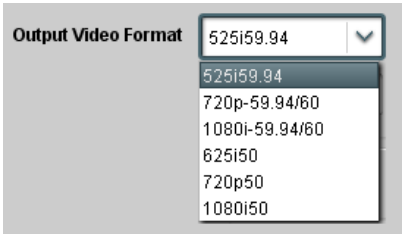
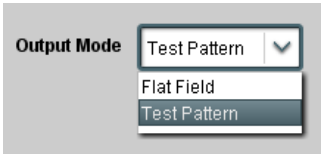
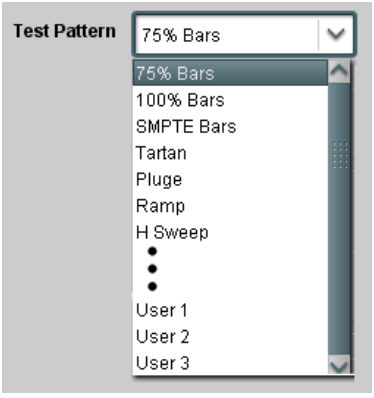
	Provides timing and test content select controls for card Y/CVBS output.
• **Output Ref Select** 	Selects ref lock from the choices shown to the left and described below. • **Lock to Reference:** Output video is locked to selected external reference received on the frame reference bus. (External reference signal Ref 1 / Ref 2 are distributed to the card and other cards via the Ref 1 / Ref 2 buses on the frame.) **Note:** If valid reference is not received, the Card state: Reference Invalid indication appears in the Card Info status portion of DashBoard™, indicating invalid frame sync reference error. **Note:** If **Lock to Input** is used for ref lock, any timing instability on the input video will result in corresponding instability on the output video. • **Free Run:** Output video is locked to the card's internal clock. Output video is **not** locked to external reference. **Note:** This control is ganged with the lock mode control on the SDI Output Format/Select tab.
• **Output Format Selector** 	Sets card analog output to formats as shown. **Note:** • Analog Video Output will output only 59.94 Hz or 50 Hz frame rates. The Output Rate drop-down selector has no effect. This is true for CVBS or HD Y-channel outputs. • Analog Video Output is intended as a reference source only. The output does not currently support embedding of VITC waveform timecode or other analog VANC content.
• **Output Mode Select** 	Selects card program video output mode from the choices shown to the left and described below. • **Flat Field** – card outputs flat field. • **Test Pattern** – card outputs standard technical test pattern (pattern is selected using the Pattern drop-down described below).
• **Test Pattern Select** 	Provides a choice of standard technical patterns, or up to three user captures.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

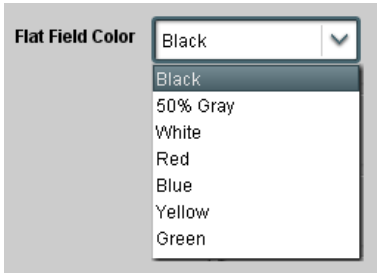
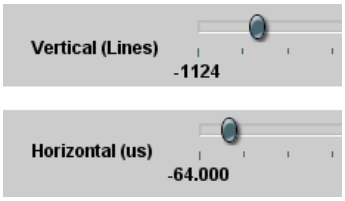
	**(continued)**
• **Flat Field Color Select** 	Where **Flat Field** is selected for **Output Mode**, provides a choice of flat field colors.
• **Output Video Reference Offset Controls** 	Provides the following controls for offsetting the output video from the reference: • **Vertical (Lines)** – sets vertical delay (in number of lines of **output video**) between the output video and the frame sync reference. (Positive values provide delay; negative values provide advance) (Range is -1124 thru 1124 lines; null = 0 lines.) • **Horizontal (µs)** – sets horizontal delay (in µs of **output video**) between the output video and the frame sync reference. (Positive values provide delay; negative values provide advance) (Range is -64 thru 64 µsec; null = 0.000 µsec.)
	
• **CVBS Oversampling and Color Controls** 	• **Oversampling** enables or disables video DAC oversampling. Oversampling can improve rendering of motion for down-conversions to the CVBS SD analog output. • **Color** enables or disables chroma content in the CVBS output.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

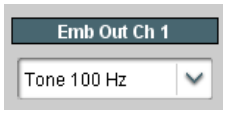
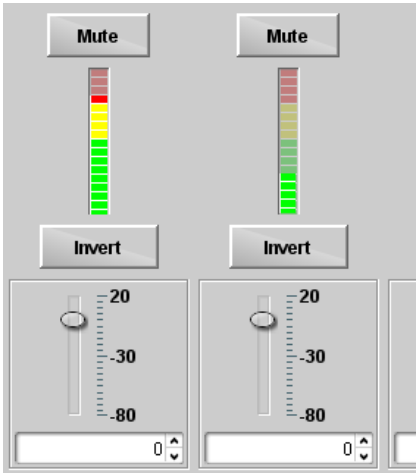
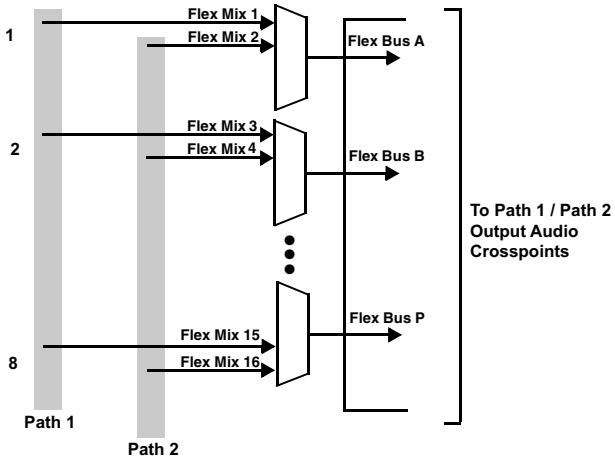
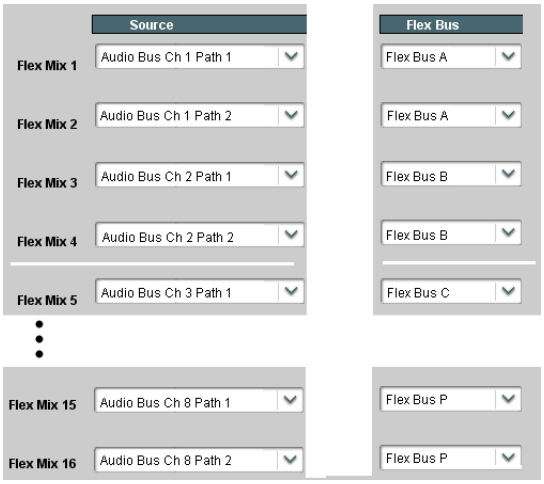
	Provides an audio crosspoint allowing the audio source selection for each embedded audio output channel. Also provides Gain, Phase Invert, and Muting controls and peak level meters for each output channel.
Note: • **Output Audio** tab has identical independent controls for both Embedded Path 1 and Path 2 using the **Path 1 / Path 2** sub-tabs. Therefore, only the **Path 1** controls are shown here. Set controls for other path using the respective sub-tab. • **Embedded Ch 2** thru **Embedded Ch 16** have controls identical to the **Source**, **Gain**, **Mute**, and **Invert** controls described here for **Embedded Ch 1**. Therefore, only the **Embedded Ch 1** controls are shown here	
• **Group Enable/Disable Controls** 	Allows enable/disable of embedded audio groups 1 thru 4 on program video output to accommodate some legacy downstream systems that may not support all four embedded audio groups. **Note:** Changing the setting of this control will result in a noise burst in all groups. This control should not be manipulated when carrying on-air content.
• **Embedded Output Channel Source** 	Using the drop-down list, selects the audio source to be embedded in the corresponding embedded output channel from the following choices: • Built-in Tone generators **Tone *n*** (-20 dBFS level tone generators with *n* being frequencies of 100, 200, 300, 400, 500, 600, 700, 800, 900, 1k, 2k, 4k, 6k, 8k, 12k, and 16k) • **LTC Path 1** / **LTC Path 2** • **Flex Bus A** thru **P** mixer sum node outputs • **Silence**
• **Channel Mute/Phase Invert/Gain Controls and Peak Level Display** 	Provides **Mute** and phase **Invert** channel controls, as well as peak level meter for each output channel. (Meter shows level as affected by Level control.) **Gain** controls allow relative gain (in dB) control for the corresponding destination Embedded Audio Group channel. (-80 to +20 dB range in 1.0 dB steps; unity = 0 dB)

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

Output Flex Mix – Provides a 16-channel mixer in which each of the inputs can be mixed onto up to 16 independent output summing nodes. The input sources include audio bus channels from the device's two embedded audio paths. Each input channel has independent gain and mute controls.

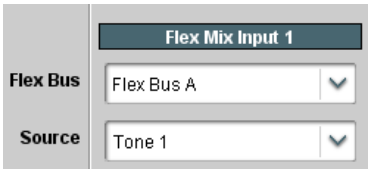
In this example, audio bus channels 1 thru 8 from each path are summed with the like-channel of the other path. These summed outputs can then be outputted on any of the card's audio outputs. The output flex bus allows cross-sourcing from both Path 1 and Path 2 embedded internal Audio Bus sources to the Path 1 and Path 2 discrete output audio crosspoints.





Note: For each Flex Mix input channel, its source should be considered and appropriately set. Unused input channels should be set to the **Silence** selection.

• Flex Bus Input Channel Source/Bus Assignment

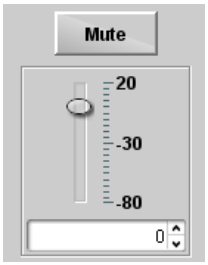


Using the **Source** drop-down list, selects the audio input source to be directed to the corresponding bus channel from the choices listed below.

- **Silence**
- **Tones 1** thru **16**

The **Flex Bus** drop-down selects the bus (A thru P) to which the input is assigned to.

• Gain / Mute Control



Provides relative gain (in dB) control and a channel **Mute** checkbox.

(-80 to +20 dB range in 0.1 dB steps; unity = 0.0 dB)

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

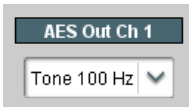
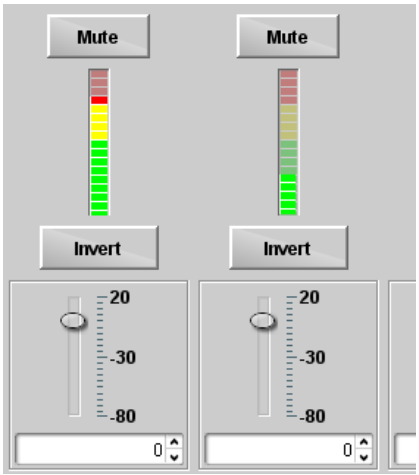
	Provides an audio crosspoint allowing the audio source selection for each AES audio output channel. Also provides Gain, Phase Invert, and Muting controls and peak level meters for each output channel.
Note: • **AES Out Ch 2** has controls identical to the **Source**, **Gain**, **Mute**, and **Invert** controls described here for **AES Out Ch 1**. Therefore, only the **AES Out Ch 1** controls are shown here. • For each channel, its source and destination should be considered and appropriately set. Unused destination channels should be set to the **Silence** selection.	
• **AES Output Channel Source** 	Using the **Path 1 Source** and **Path 2 Source** drop-down lists, selects the audio input source to be routed to the corresponding AES output channel from the choices listed below. Apply the desired path selection using the **Path** toggle button. • Built-in Tone generators **Tone *n*** (-20 dBFS level tone generators with *n* being frequencies of 100, 200, 300, 400, 500, 600, 700, 800, 900, 1k, 2k, 4k, 6k, 8k, 12k, and 16k) • **LTC Path 1** / **LTC Path 2** • **Flex Bus A** thru **P** mixer sum node outputs • **Silence**
• **Channel Mute/Phase Invert/Gain Controls and Peak Level Display** 	Provides **Mute** and phase **Invert** channel controls, as well as peak level meter for each output channel. (Meter shows level as affected by Level control.) **Gain** controls allow relative gain (in dB) control for the corresponding destination AES output channel. (-80 to +20 dB range in 1.0 dB steps; unity = 0 dB)

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

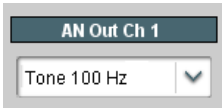
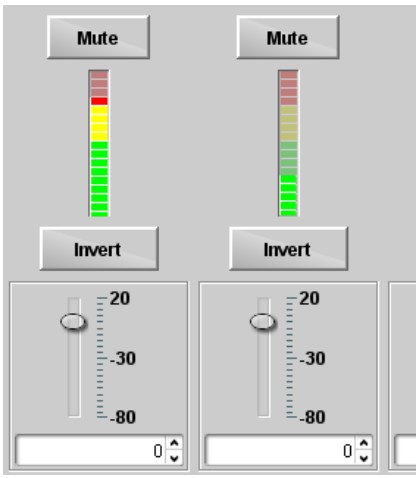
	Provides an audio crosspoint allowing the audio source selection for each analog audio output channel. Also provides Gain, Phase Invert, and Muting controls and peak level meters for each output channel.
• **Analog Output Channel Source** 	Using the **Source** drop-down list, selects the audio input source to be routed to the corresponding analog audio output channel from the following choices: • Built-in Tone generators **Tone *n*** (-20 dBFS level tone generators with *n* being frequencies of 100, 200, 300, 400, 500, 600, 700, 800, 900, 1k, 2k, 4k, 6k, 8k, 12k, and 16k) • **LTC Path 1** / **LTC Path 2** • **Flex Bus A** thru **P** mixer sum node outputs • **Silence**
• **Channel Mute/Phase Invert/Gain Controls and Peak Level Display** 	Provides **Mute** and phase **Invert** channel controls, as well as peak level meter for each output channel. (Meter shows level as affected by Level control.) **Gain** controls allow relative gain (in dB) control for each corresponding destination analog audio out channel. (-80 to +20 dB range in 1.0 dB steps; unity = 0 dB)

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

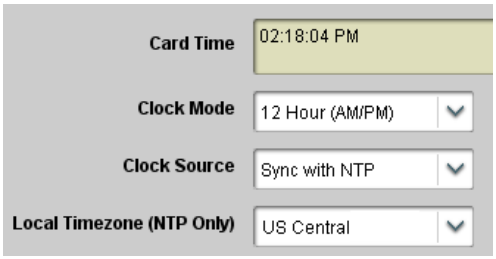
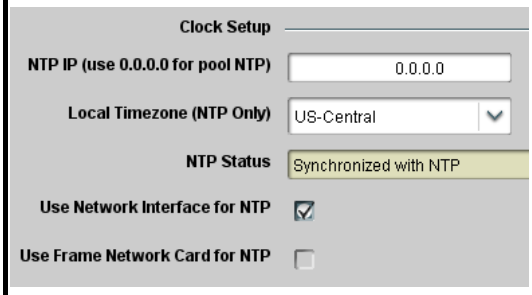
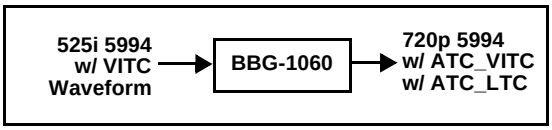
Clock	Provides controls for setting device time.
• **Clock Mode / Set Controls** 	Allows clock time and display mode to be set as follows: • **Clock Mode** selects between 24-hour (“military”) time, or time using AM and PM designations. • **Clock Source** selects user-entered arbitrary time or NTP-synced time. • **Local Timezone** provides timezone offsets for localization when using NTP time. • **Card Time** display shows the currently configured running wall-clock time (whether set as user-entered arbitrary time or NTP-synced time). **Note:** NTP syncing is only done at various intervals. To invoke resyncing, power-cycle to device to immediately sync with NTP.
• **NTP Clock Setup** 	Allows device NTP clock IP source and localization. This is the clock/time device will use for logs and other recorded actions. • **NTP IP** sets the IP address where NTP is to be obtained. • **Local Timezone** sets the recorded time to the localized time. • **NTP Status** shows if time is synced with NTP or if an error exists. • **Use Network Interface** and **User Frame Network Card** checkboxes allows selecting the network source that will provide NTP time.

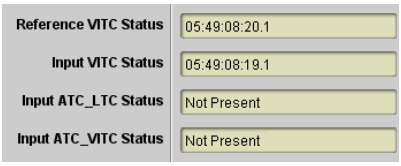
Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

Timecode	Provides timecode data formatting and insertion controls for inserting the timecode into the output video.

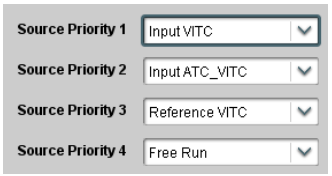
Note: **Timecode** tab has identical independent controls for both Path 1 and Path 2 using the **Path 1 / Path 2** sub-tabs. Therefore, only the **Path 1** controls are shown here. Set controls for other path using the respective sub-tab.

Shown below is an example in which received 525i 5994 SDI video is being up-converted to 720p 5994. To re-format and insert the timecode data, the following can be performed using the Timecode function. Each Timecode control is fully described on the pages that follow.



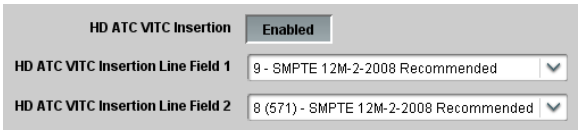


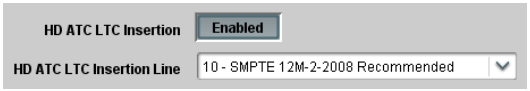
A Noting that the incoming video contains VITC waveform timecode data (as shown in the status display), set the Source Priority drop-down lists to include VITC Waveform timecode data (**Input VITC**) as a choice. This extracts VITC Waveform timecode data from the incoming video.



B In this example, it is desired to provide both SDI ATC_VITC and ATC_LTC timecode data in the converted HD output video. As such, set both **HD ATC VITC Insertion** and **HD ATC LTC Insertion** to **Enabled**.

In the example here, the line numbers are set to the default SMPTE 12M-2-2008 recommended values.





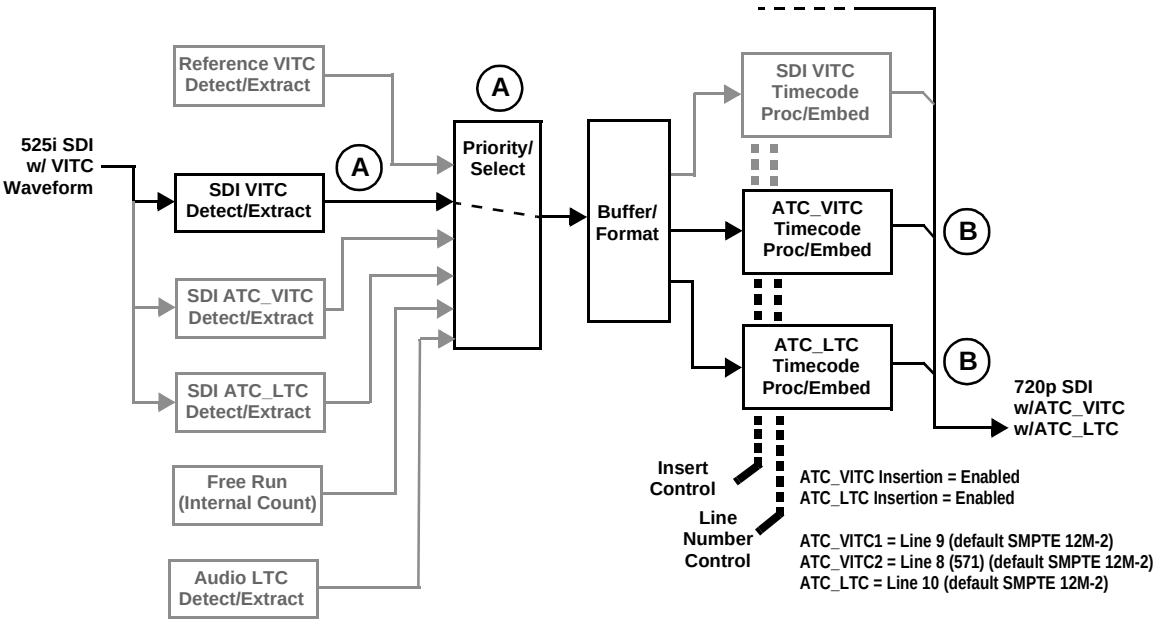


Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

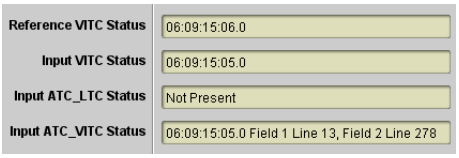
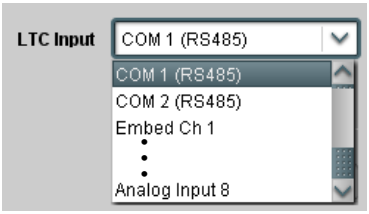
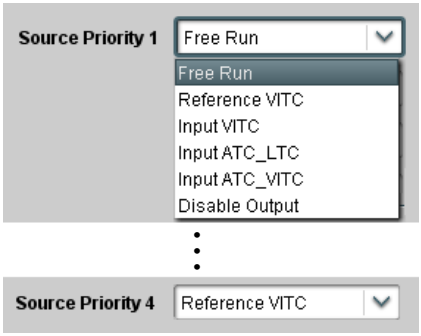
Timecode	(continued)
Audio LTC controls described below allows audio LTC from an audio channel to be used as a timecode source, with conversion to a selected SMPTE 12M format on the output video.	
• **Timecode Source Status Displays** 	Displays the current status and contents of the four supported external timecode formats shown to the left. • If a format is receiving timecode data, the current content (timecode running count and line number) is displayed. • If a format is not receiving timecode data, Not Present is displayed.
• **LTC Input Control** 	Selects source to be used by device to **receive** LTC as listed below. • RS-232/485 over COM1 or COM 2 • Audio LTC over Emb Ch 1 thru Ch 16 • Audio LTC over AES Ch 1 thru Ch 16 • Audio LTC over Analog audio Ch 1 thru Ch 8 **Note:** • **Audio LTC Source** must be appropriately set for device to receive and process received LTC. • If COM 1 or COM 2 is used for LTC receive, the port function must be set for LTC. See COMM Ports Setup Controls (p. 3-41) for more information. • Audio inputs will not center inputs with DC offset. If input has DC offset, the source may need to be capacitively coupled to remove the offset.
• **Mute LTC Control** 	Allows LTC audio or RS-485 output to mute upon loss of selected timecode inputs. • When set to **Enabled** and input timecode is lost: • RS-485 LTC output goes to frozen state. • Audio LTC output mutes. • When set to **Disabled** and input timecode is lost: • RS-485 LTC output keeps counting, with count value being free-run count. • Audio LTC output is not muted, with count value being free-run count. **Note:** If muting upon loss of a particular input format is desired, set all **Source Priority 1** thru **4** to that particular input format. If this is not done, the device failover timecode selection may substitute another format choice for the format not being received.
• **Incoming ATC Packet Removal Control** 	Enables or disables removal of existing input video ATC timecode packets from the output. This allows removal of undesired existing timecodes from the output, resulting in a “clean slate” where only desired timecodes are then re-inserted into the output. (For example, if both SDI ATC_VITC and ATC_LTC are present on the input video, and only ATC_LTC is desired, using the Removal control will remove both timecodes from the output. The ATC_LTC timecode by itself can then be re-inserted on the output using the other controls discussed here.) **Note:** When the Scaler is enabled, ATC packets are automatically removed. The Timecode function must be used to re-insert the timecode data into the output video.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

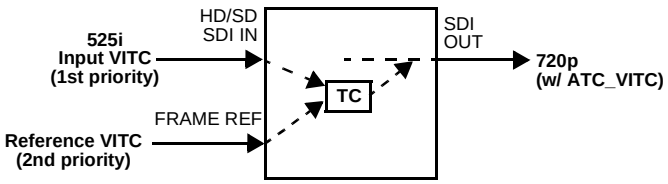
(continued)

• **Source Priority**



Selects the priority assigned to each of the four supported external formats, and internal Free Run in the event the preferred source is unavailable.

Source Priority 1 thru **Source Priority 4** select the preferred format to be used in descending order (i.e., Source Priority 2 selects the second-most preferred format, and so on. See example below.)



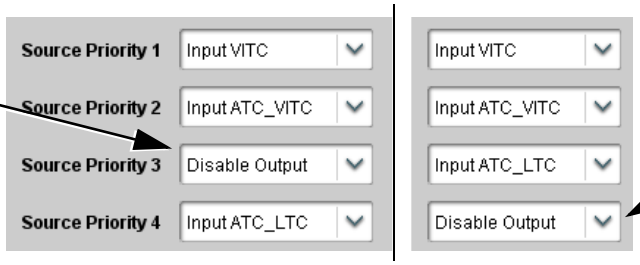
In this example, **Input VITC** 1st priority selection selects SDI VITC (received on SDI input) over reference VITC (received on frame reference) regardless of video input material source to be processed by the card.

The selected timecode source is embedded on the SDI video output (in this example, 720p) using the selected line number. In this example, if the SDI VITC on the SDI input becomes unavailable, the card then uses the reference VITC data received on the frame reference.

Note: Disable Output setting should be used with care. If Disable Output is selected with alternate intended format(s) set as a lower priority, the device will indeed disable **all** timecode output should the ordinate preferred format(s) become unavailable.

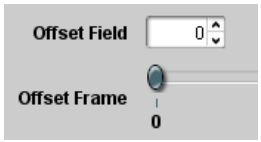
Typically, choices other than Disable should be used if a timecode output is always desired, with Disable only being used to remove all timecode data.

In this example, even though and ATC_LTC could be available to substitute for ATC_VITC not being present, the card will revert to no timecode output since the choice of Disable Output "out-prioritizes" ATC_LTC with these settings.



The choices shown here will allow ATC_LTC to "out-prioritize" Disable Output if ATC_VITC is not available.

• **Offset Controls**



Allows the current timecode count to be advanced or delayed on the output video.

- **Offset Advance** or **Delay** selects offset advance or delay.
- **Offset Field** delays or advances or delays timecode by one field.
- **Offset Frame** delays or advances or delays timecode by up to 5 frames.

Note: Default settings are null, with both controls set at zero as shown.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

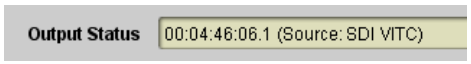
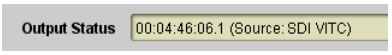
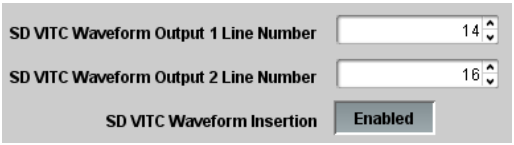
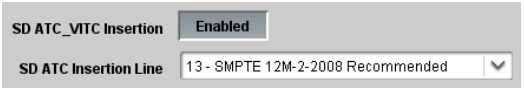
Timecode	(continued)
• **Output Status Display** 	Displays the current content and source being used for the timecode data as follows:  • Output status OK (in this example, SDI VITC timecode received and outputted).  • **Timecode Insertion** button set to **Disabled**; output insertion disabled. **Note:** • If timecode is not available from Source Priority selections performed, timecode on output reverts to Free Run (internal count) mode. • Because the 1's digit of the display Frames counter goes from 0 to 29, the fractional digit (along with the 1's digit) indicates frame count as follows: 0.0 Frame 0 0.1 Frame 1 1.0 Frame 2 1.1 Frame 3 • • • 29.1 Frame 59
• **Audio LTC Output**	Audio LTC output is routed to desired embedded, AES, or analog audio outputs using the Output Audio Routing/Controls (p. 3-18). Whatever timecode is displayed on the Output Status is converted to audio LTC and available as an LTC audio output.
Note: • Although the output line drop-down on the controls described below will allow a particular range of choices, the actual range is automatically clamped (limited) to certain ranges to prevent inadvertent conflict with active picture area depending on video format. See Ancillary Data Line Number Locations and Ranges (p. 3-9) for more information. • The device does not check for conflicts on a given line number. Make certain the selected line is available and carrying no other data.	
• **SD VITC Waveform Insertion Controls** 	For SD output, enables or disables SD VITC waveform timecode insertion into the output video, and selects the VITC1 and VITC2 line numbers (6 thru 22) where the VITC waveform is inserted. **Note:** • If only one output line is to be used, set both controls for the same line number. • **SD VITC Waveform Insertion** control only affects VITC waveforms inserted (or copied to a new line number) by this function. An existing VITC waveform on an unscaled SD SDI stream is not affected by this control and is passed on an SDI output.
• **SD ATC Insertion Control** 	For SD output, enables or disables SD ATC_VITC timecode insertion into the output video, and selects the line number for ATC_VITC.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

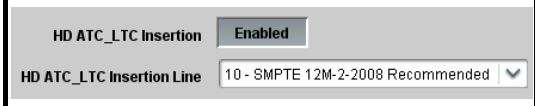
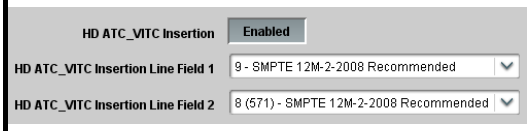
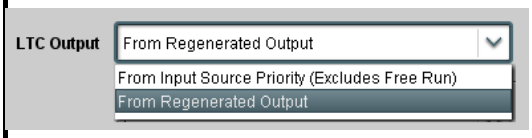
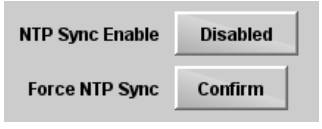
Timecode	**(continued)**
• HD ATC_LTC Insertion Control 	For HD output, enables or disables ATC_LTC timecode insertion into the output video, and selects the line number for ATC_LTC timecode data.
• HD ATC_VITC Insertion Control 	For HD output, enables or disables ATC_VITC timecode insertion into the output video, and selects the line number for ATC_VITC1 and ATC_VITC2.
• ATC_VITC Legacy Support Control 	When enabled, accommodates equipment requiring ATC_VITC packet in both fields as a “field 1” packet (non-toggling). **Note:** Non-toggling VITC1 and VITC2 packets do not conform to SMPTE 12M-2-2008 preferences. As such, ATC_VITC Legacy Support should be enabled only if required by downstream equipment.
• LTC Out Source Select 	Selects LTC source from Input Video or from Regenerated Output.
• Free Run Timecode Controls 	Allows an initial (starting) count to be applied to output video timecode when Free Run insertion is enabled. **Note:** • Initialization can only be applied when device is outputting Free Run timecode (as shown by Output Status displaying “Free Run”). • If failover to Free Run occurs due to loss of external timecode(s), the Free Run count assumes its initial count from the last valid externally supplied count.
• NTP Sync Controls 	Allows output timecode to be synced to device NTP (received from frame). Force NTP Sync forces timecode to sync at next available instance. **Note:** Device must be using clock synced with NTP in order for NTP synced timecode. See Clock (Wall-Clock Time/LTC) Controls (p. 3-22) for more details.

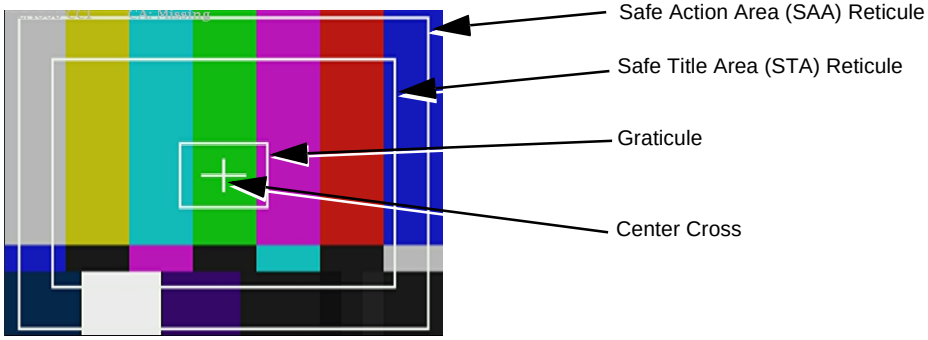
Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

Allows Safe Action and/or Safe Title overlays and other static markers to be added to the output video image.

Note: **Reticules** tab has identical independent controls for both Path 1 and Path 2 using the **Path 1 / Path 2** sub-tabs. Therefore, only the **Path 1** controls are shown here. Set controls for other path using the respective sub-tab.

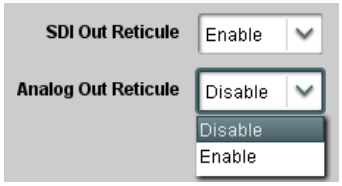
Typical Reticule/Overlay Marker Insertions

The BBG-1060-TG2-REF1 allows any combination of the reticule/overlay markers to be applied to the output video. Sizing and other characteristics for each type of marker can be set as described below.



Note:
- Overlay markers using this function are for setup only. When enabled, these markers are embedded in the output video and will appear in the image. Use this function **only** on preview video and not on-air video. Make certain any overlay tools are turned **off** when no longer needed.
- Multiple overlay markers described below can be simultaneously enabled as desired.

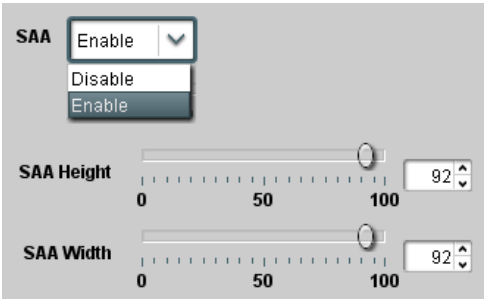
• Insertion Master Enable/Disable



Provides independent master enable/disable for device SDI and CVBS outputs.

- When enabled, any combination of reticules or other markers described below can be inserted.
- When disabled, insertion of all reticules or other markers is disabled.

• Safe Action Area (SAA) Controls



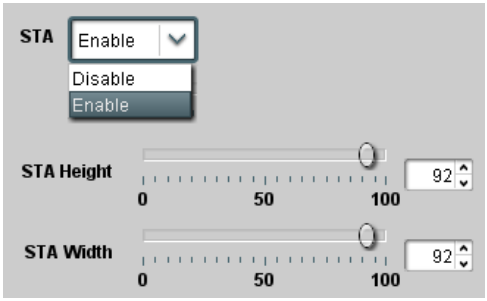
- **SAA** provides enable/disable of safe action area graticule insertion.
- **SAA Height** and **SAA Width** control height and width of insertion (from 0% to 100% of 4:3 outputted image area).

Note: Reticule Size control is locked to Custom for this device, with safe action area size control as described above.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

(continued)

• Safe Title Area (STA) Controls



- **STA** provides enable/disable of safe title area graticule insertion.
- **STA Height** and **STA Width** control height and width of insertion (from 0% to 100% of 4:3 outputted image area).

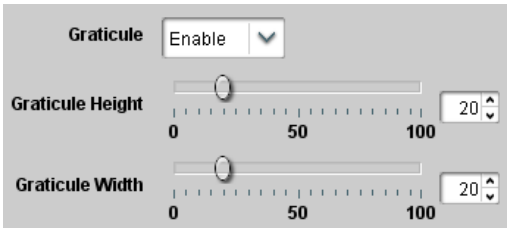
• Overlay Color Controls

- **Overlay Color** selects from white, various gray fills, or black colors.
- **Inverse Color** selects inversion (negative) of current selection.
- **Opacity** sets the opacity of the overlay for both white/black and inverse color modes.
- **Thickness** sets the line thickness (in pixels).

Provides insertion and sizing controls for custom graticules and other markers. Also provides NTSC legacy 4:3 master reticule sizing.

Note: Color attributes of markers described below are set using the master Overlay Color Controls described above.

• Graticule Controls



- **Graticule** provides enable/disable of user graticule insertion.
- **Graticule Height** and **Width** control height and width of insertion (from 0% to 100% of 4:3 outputted image area).

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

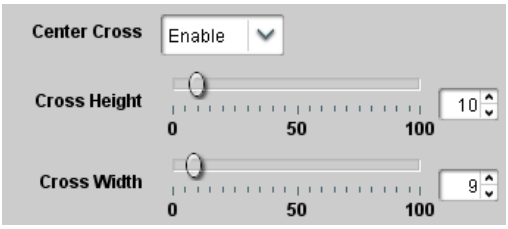
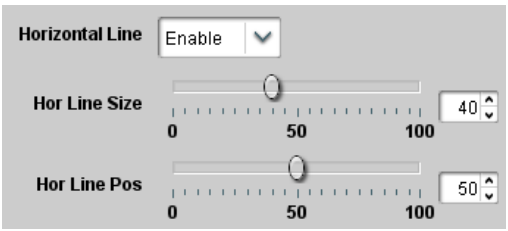
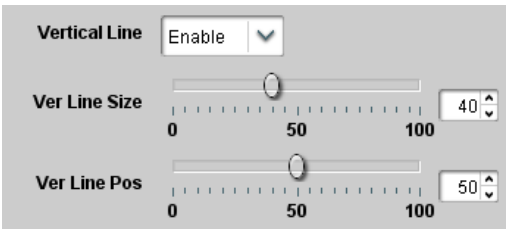
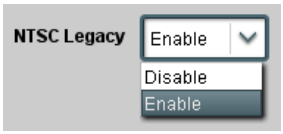
	**(continued)**
• Center Cross Controls 	• **Center Cross** provides enable/disable of center cross insertion. • **Cross Height** and **Width** control height of vertical line and width of horizontal line (from 0% to 100% of 4:3 outputted image area).
• Horizontal Line Controls 	• **Horizontal Line** provides enable/disable of horizontal line insertion. • **Horizontal Line Size** controls the width of the horizontal line (from 0% to 100% of 4:3 outputted image area). • **Horizontal Line Pos** controls the vertical positioning of the horizontal line (from 0% to 100% of 4:3 outputted image area).
• Vertical Line Controls 	• **Vertical Line** provides enable/disable of vertical line insertion. • **Vertical Line Size** controls the height of the vertical line (from 0% to 100% of 4:3 outputted image area). • **Vertical Line Pos** controls the horizontal positioning of the line (from 0% to 100% of 4:3 outputted image area).
• NTSC Legacy Reticule Fixed Control 	When set to enable, provides fixed-size safe action area 4:3 reticule suited for CRT-based displays.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

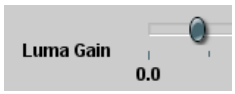
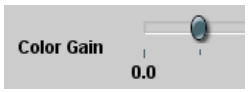
	Provides the following Video Proc parametric controls.
Note: Video Proc tab has identical independent controls for both Path 1 and Path 2 using the **Path 1 / Path 2** sub-tabs. Therefore, only the **Path 1** controls are shown here. Set controls for other path using the respective sub-tab.	
• **Video Proc** 	**Video Proc (Enable/Disable)** provides master on/off control of all Video Proc functions. • When set to **Disable**, Video Proc is bypassed. • When set to **Enable**, currently displayed parameter settings take effect.
• **Reset to Unity** 	**Reset to Unity** provides unity reset control of all Video Proc functions. When Confirm is clicked, a **Confirm?** pop-up appears, requesting confirmation. • Click **Yes** to proceed with the unity reset. • Click **No** to reject unity reset.
• **Luma Gain** 	Adjusts gain percentage applied to Luma (Y channel). (0% to 200% range in 0.1% steps; unity = 100%)
• **Luma Lift** 	Adjusts lift applied to Luma (Y-channel). (-100% to 100% range in 0.1% steps; null = 0.0%)
• **Color Gain** 	Adjusts gain percentage (saturation) applied to Chroma (C-channel). (0% to 200% range in 0.1% steps; unity = 100%)

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

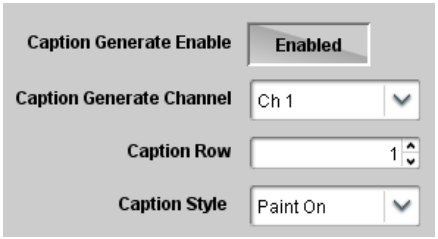
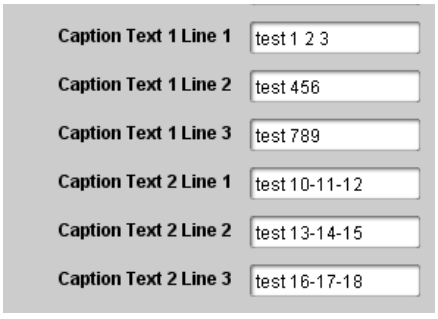
Video Proc	**(continued)**
• **Color Phase** 	Adjusts phase angle applied to Chroma. (-360° to 360° range in 0.1° steps; null = 0°)
• **Gang Luma/Color Gain** 	When set to **On**, changing either the **Luma Gain** or **Color Gain** controls increases or decreases both the Luma and Color gain levels by equal amounts.
Closed Captioning	Provides support for closed captioning generator setup. Closed captioning tool inserts S334-1 CDP(708) on line 9 of output SDI video.
Note: • Closed captioning generator is intended only for test pattern or user pattern insertions, and not input video. • **Closed Captioning** tab has identical independent controls for both Path 1 and Path 2 using the respective **Path 1 / Path 2** sub-tabs. Therefore, only the **Path 1** controls are shown here. Set controls for other path using the respective sub-tab.	
• **Closed Captioning Setup/Insertion Controls** 	Provides controls for selecting channel, scroll style and master enable/ disable as follows: • **Enable** sets captioning enabled (insert packets on line 9) or disable (no CC insertion). • **Caption Generate Channel** sets the CC channel where insertion is performed (Ch 1 thru Ch 4). • **Caption Row** selects the vertical row in which the captioning starts its scroll (1 up to 15). • **Caption Style** selects the layout style of the captioning as it appears on downstream systems capable of displaying the text as user-visible text as Paint On, Pop On, or Roll Up.
• **Caption Text Insert Fields** 	Provides user entry fields for up to six text lines. **Note:** • All normal keyboard alphanumeric characters are supported, in addition to ASCII characters (Windows ALT+*nnnn*). • Up to 126 characters can be entered.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

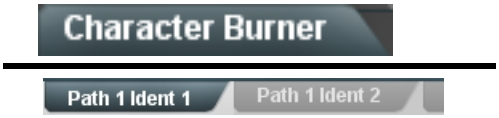
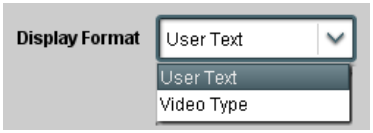
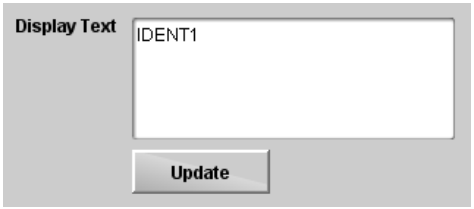
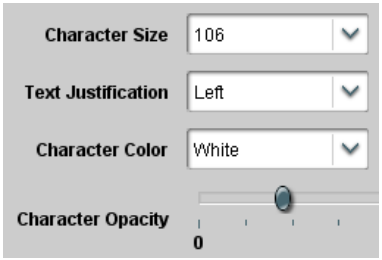
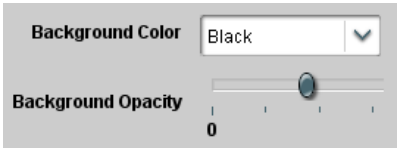
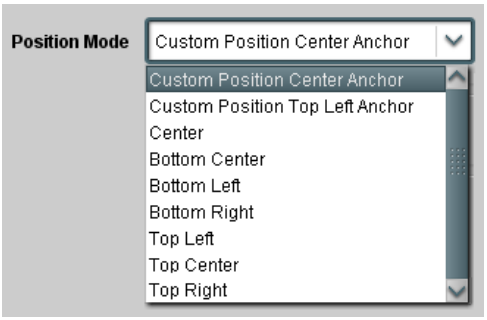
	Provides user-configurable burn-in of up to two text strings and timecode on output video.
Note: • **Character Burner** tab has identical independent controls for both Path 1 and Path 2 using the respective **Path 1 / Path 2** sub-tabs. Therefore, only the **Path 1** controls are shown here. Set controls for other path using the respective sub-tab. • For both Path 1 and Path 2, **Ident 1** and **Ident 2** sub-tabs provide identical, independent controls for inserting two independent text (identification) burn-in overlays on each path's output video. **Ident 2** has controls identical to the controls described here for Ident 1. (Both Path 1 and Path 2 each have identical independent Ident 1 and Ident 2 insertion controls; only the Ident 1 controls are shown here.)	
• **Ident Insertion Controls** 	Selects the rules for identification text burn-in overlay insertion into output video. **Note:** If ident text insertion is desired for input LOS conditions, the device must be set to output a raster or capture to support the text insertion.
• **Display Type (Format) Select** 	Selects the type of data to be displayed as burn-in text from choices shown. • **User text** allows user text to be entered using field described below. • **Video type** inserts an overlay showing the video format of the input being used for processing.
• **Display (Ident) Text Entry Field** 	Dialog entry box that allows entry of desired ident text string. Enter desired text as click Update when done to input the text string. **Note:** • All normal keyboard alphanumeric characters are supported, in addition to ASCII characters (Windows ALT+*nnnn*). • Up to 126 characters can be entered.
• **Ident Text Attributes Controls** 	Sets burn-in size/position attributes as follows: • **Character Size** sets character size (in pixels). • **Text Justification** selects from left, right, or center-aligned justification within the text box overlay. • **Character Color** selects text color. • **Character Opacity** sets text opacity from 0% (least opacity) to 100% (full opacity).
• **Ident Text Background Attributes Controls** 	Provides independent controls for setting the color and opacity of the burn-in text and its background. • **Color** drop-down sets background color from multiple choices. • **Opacity** control sets background opacity from 0% (least opacity) to 100% (full opacity).

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

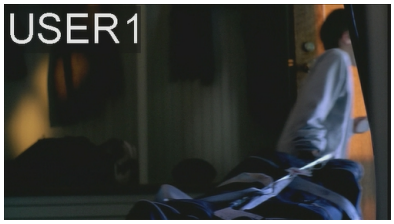
(continued)

• Ident Position Select

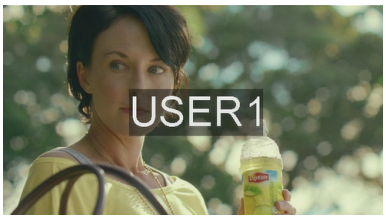


Sets the location of the ident text insertion from choices shown or custom. (When Custom is selected, position is configured using the **Ident Text Positioning Controls** described below.)

Example: Ident 1 text using **Top Left** position

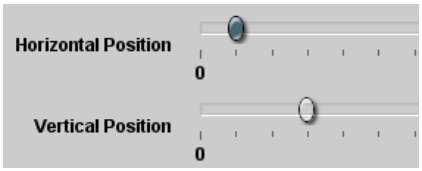


Example: Ident 1 text using **Center** position



Note: For SD usage, burn-ins can impinge on and corrupt line 21 closed-captioning waveform if positioned too close to the upper right of the raster.

• Ident Text Positioning Controls



With Custom selected, sets burn-in position attributes as follows:

- **Horizontal Position** sets horizontal position (in percentage of offset from left of image area). (Range is 0 thru 100%)
- **Vertical Position** sets vertical position (in percentage of offset from top of image area, top justified). (Range is 0 thru 100%)

Note: • Horizontal and Vertical Position controls are functional only when **Custom Position** is selected.

• Character sizing and positioning for a given raster format may not be appropriate for another format (especially if transitioning from HD to SD). Set size and position for a balanced appearance (e.g., do not place text too close to margins or set larger than necessary) that accommodates both HD and SD raster formats if multiple format use is required.

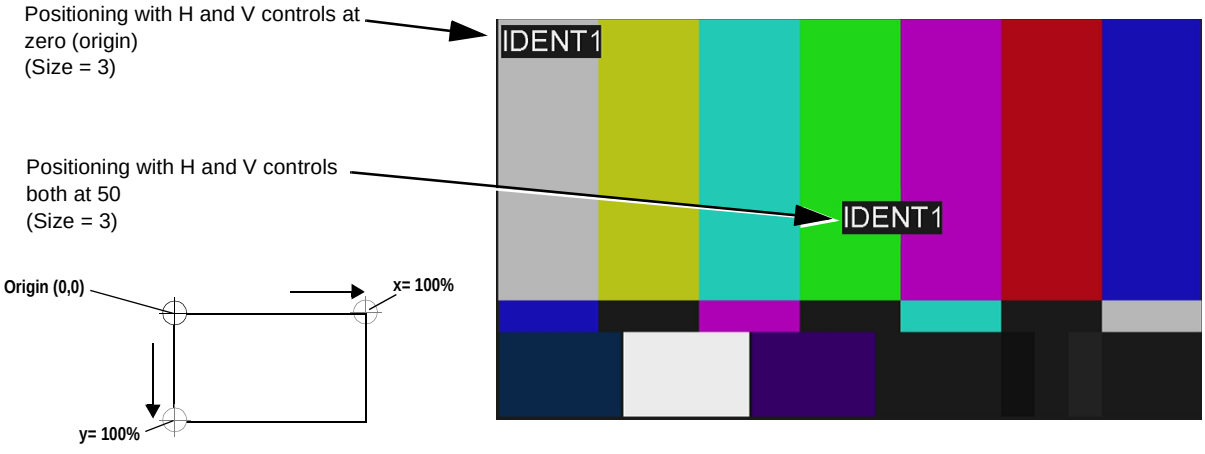


Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

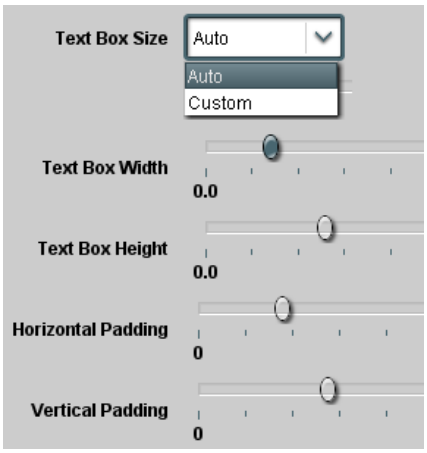
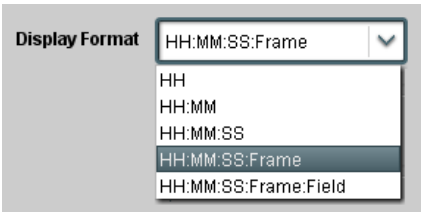
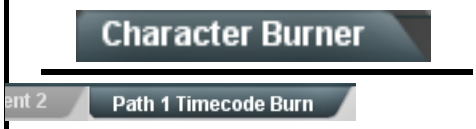
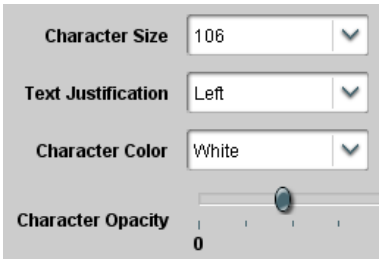
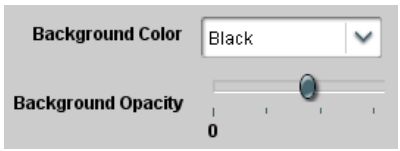
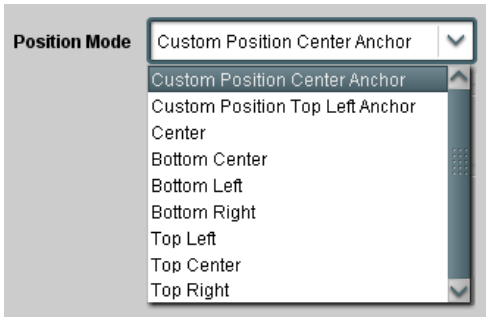
<table>
<tr><td> 
</td><td>(continued)</td></tr>
<tr><td>• Text Box Sizing Controls
 
</td><td>Provides controls for setting the size of the burn-in text background box.
• Auto allows text box to proportionally size with selected text size.
• Custom allows override of proportional sizing and allows text V and H dimensions to be set as desired.
• Text Box Width and Height allow manual sizing when set to Custom.
• Custom allows override of proportional sizing and allows text V and H dimensions to be set as desired.
• Horizontal and Vertical Padding allow fine adjustment of V and H dimensions to be set when Auto is selected.</td></tr>
<tr><td>• Text Box Border Enable
 
</td><td>When set to Enabled, applies a white hairline border to the text box edges.</td></tr>
<tr><td> 
</td><td>Provides controls for burn-in of timecode on output video.</td></tr>
<tr><td colspan="2">Note: This status display mirrors the same display in the Timecode tab. Device must be set to output a timecode in order for timecode burn-in to function. See Timecode Controls (p. 3-23) for information on using timecode controls.</td></tr>
<tr><td>• Timecode Insertion Control
 
</td><td>Selects the rules for timecode burn-in overlay insertion into output video.
Note: If timecode insertion is desired for input LOS conditions, the device must be set to provide a raster or capture to support the timecode insertion.</td></tr>
<tr><td>• Timecode Format Display Selector
 
</td><td>Selects the format of timecode string burn-in overlay insertion into output video from choices shown.</td></tr>
</table>

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

<table>
<tr><td> 
</td><td>(continued)</td></tr>
<tr><td>• Timecode Attributes Controls
 
</td><td>Sets burn-in size/position attributes as follows:
• Character Size sets character size (in pixels).
• Text Justification selects from left, right, or center-aligned justification within the text box overlay.
• Character Color selects text color.
• Character Opacity sets text opacity from 0% (least opacity) to 100% (full opacity).</td></tr>
<tr><td>• Timecode Background Attributes Controls
 
</td><td>Provides independent controls for setting the color and opacity of the burn-in text and its background.
• Color drop-down sets background color from multiple choices.
• Opacity control sets background opacity from 0% (least opacity) to 100% (full opacity).</td></tr>
<tr><td>• Timecode Position Select
 
</td><td>Sets the location of the timecode insertion from choices shown or custom. (When Custom is selected, position is configured using the Timecode Positioning Controls described below.)
Example: Timecode burn-in using Bottom Center position
 

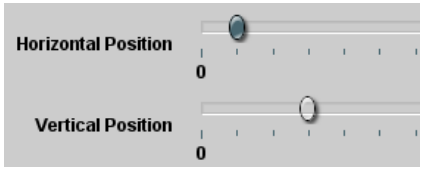
Example: Timecode burn-in using Top Left position
 
</td></tr>
<tr><td>• Timecode Positioning Controls
 
</td><td>With Custom selected, sets burn-in position attributes as follows:
• Horizontal Position sets horizontal position (in percentage of offset from left of image area). (Range is 0 thru 100%)
• Vertical Position sets vertical position (in percentage of offset from top of image area, top justified). (Range is 0 thru 100%)
Note: • Horizontal and Vertical Position controls are functional only when Custom Position is selected.
• Character sizing and positioning for a given raster format may not be appropriate for another format (especially if transitioning from HD to SD). Set size and position for a balanced appearance (e.g., do not place text too close to margins or set larger than necessary) that accommodates both HD and SD raster formats if multiple format use is required.</td></tr>
</table>

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

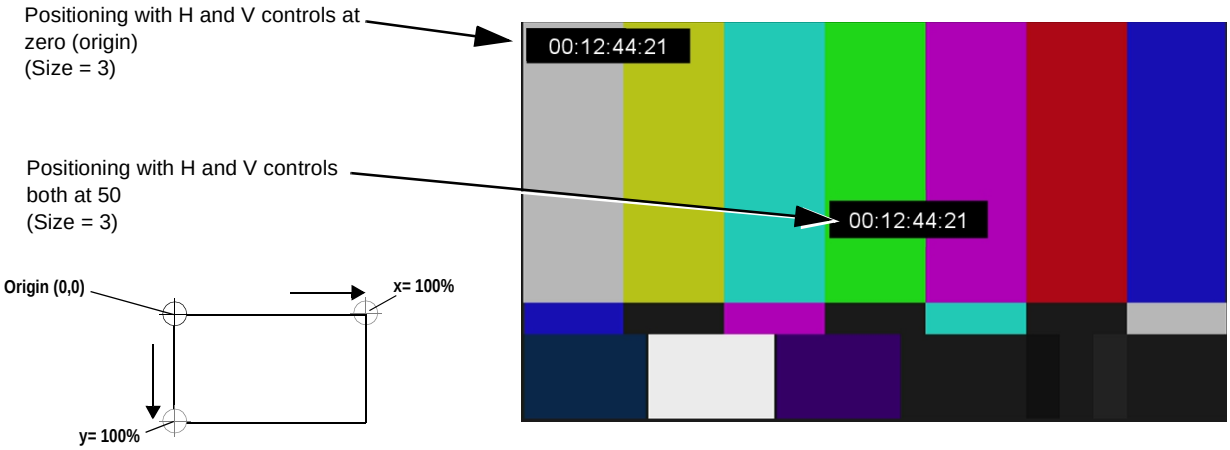
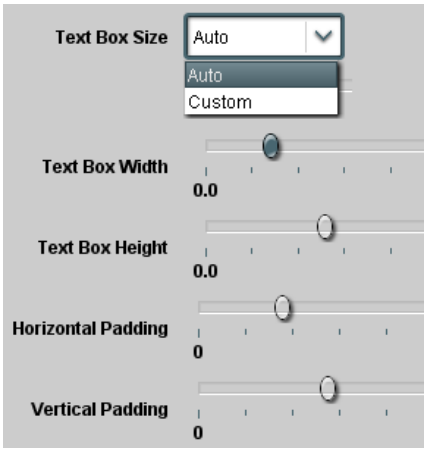
<table>
<tr><td> 
</td><td>(continued)</td></tr>
<tr><td colspan="2"> 
</td></tr>
<tr><td>• Text Box Sizing Controls
 
</td><td>Provides controls for setting the size of the burn-in background box.
• Auto allows text box to proportionally size with selected text size.
• Custom allows override of proportional sizing and allows text V and H dimensions to be set as desired.
• Text Box Width and Height allow manual sizing when set to Custom.
• Custom allows override of proportional sizing and allows text V and H dimensions to be set as desired.
• Horizontal and Vertical Padding allow fine adjustment of V and H dimensions to be set when Auto is selected.</td></tr>
<tr><td>• Text Box Border Enable
 
</td><td>When set to Enabled, applies a white hairline border to the text box edges.</td></tr>
</table>

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

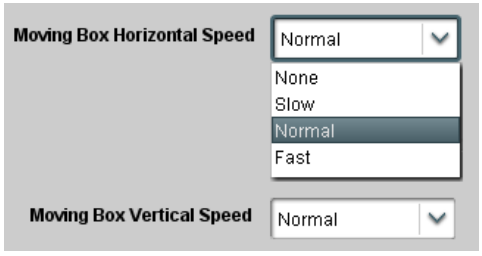
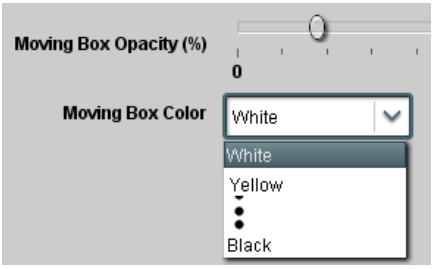
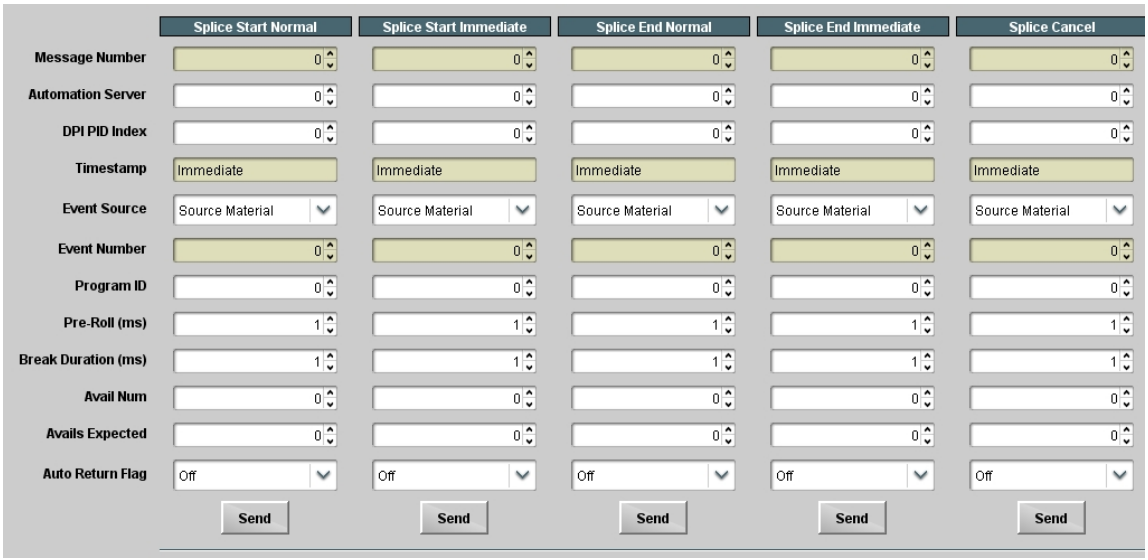
Moving Box	Provides a “moving box” graphic insertion (overlay) on the output video. Moving-box insertion can serve as a dynamic raster confidence check even in cases where the input video image is static or lost.
Note: **Moving Box** tab has separate independent controls for both Path 1 SDI/Analog and Path 2 SDI using the **Path 1 / Path 2** sub-tabs. Therefore, only the **Path 1** controls are shown here. Set controls for other path using the respective sub-tab.	
	Moving-box insertion provides dynamic display even on static video. Attributes such as box size, color, vertical movement speed, and horizontal movement speed are all user configurable. Moving box can be set to insert continuously, or only upon loss of input.
• **Moving Box Insertion Controls** 	Selects the rules for moving-box overlay insertion into output video. **Note:** If moving box insertion is desired for input LOS conditions, the SDI Output > **Output Mode** control **must** be set to provide a raster (from one of the choices shown) to support the text insertion.
• **Moving Box Size Controls** 	Sets size of box image burn-in as follows: • **Moving Box Width** sets the width (as a percentage of maximum available raster width. (Range is 0% thru 40%) • **Moving Box Height** sets the height (as a percentage of maximum available raster height. (Range is 0% thru 40%) **Note:** Moving box sizing for a given raster format may not be appropriate for another format (especially if transitioning from HD to SD). Set size and position for a balanced appearance that accommodates both HD and SD raster formats if multiple format use is required.
• **Moving Box Speed Controls** 	Sets speed of motion for moving box image burn-in as follows: • **Moving Box Horizontal Speed** sets the X-axis speed from choices shown. • **Moving Box Vertical Speed** sets the Y-axis speed from choices shown.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

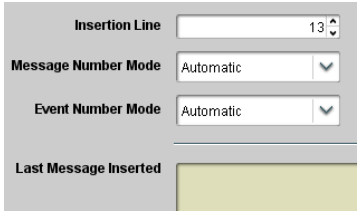
Moving Box	**(continued)**
• **Moving Box Attributes Controls** 	Provides independent controls for setting the color and opacity of the moving-box insertion. • **Color** drop-down sets box color from multiple choices. • **Opacity** controls sets box opacity from 0% (least opacity) to 100% (full opacity).
SCTE 104 Insertion	Provides controls for inserting SCTE 104 packages into the SDI output test signal. Controls provide automation server connections, ID markers, and interstitial insertion splice padding.

Note: • Controls on this page use five columns correlating to standard SCTE 104 control protocols, with each column containing controls for each control protocol. Knowledge of using SCTE 104 protocols is assumed when using this page, as basic descriptions of SCTE 104 usage and protocol is not within the scope of this manual. SCTE 104 insertion is available only for Path 1.

• SCTE 104 actions are typically triggered using GPI commands in conjunction with the Event Setup Controls tab. See Event Setup Controls on page 3-44 for more information.



Five columns corresponding to SCTE 104 setup protocols provide setup controls for insertion of SCTE 104 ancillary data into the output SDI stream. The **Send** button for each column allows overriding any queued insertions and immediately inserting the command.

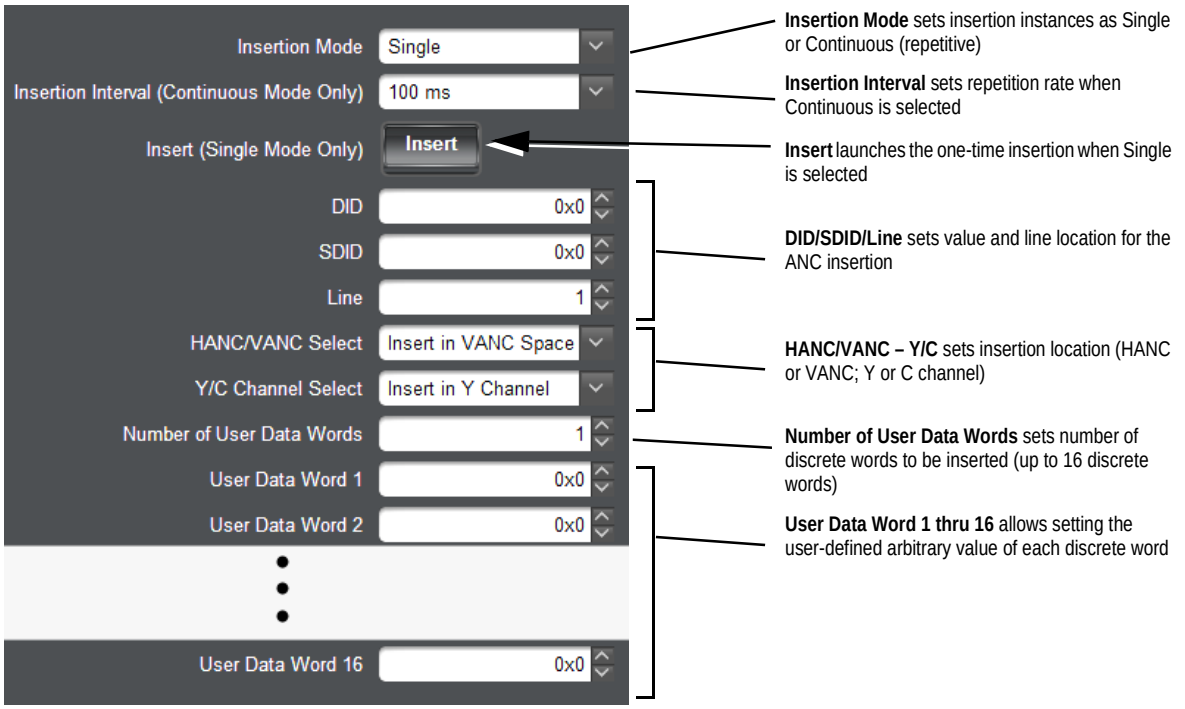


Auxiliary controls allow selecting VANC insertion line number
Message Number Mode set to Automatic allows automcatically incrementing message numbering. When set to Manual, the Event Number drop-down is enabled.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

ANC Packet Insertion	Provides setup controls for inserting test packets in output SDI VANC/HANC space.

Note: **ANC Packet Insertion** tab has separate independent controls for both Path 1 SDI and Path 2 SDI using the **Path 1 / Path 2** sub-tabs. Therefore, only the **Path 1** controls are shown here. Set controls for other path using the respective sub-tab.



Note: DashBoard versions 4.1 and earlier display and notate DID, SDID, and User Data Word numbers in decimal; newer DashBoard versions display and notate DID, SDID, and User Data Word numbers in hexadecimal. Hexadecimal notation is denoted by the "0x" preceding the value.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

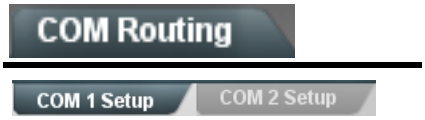
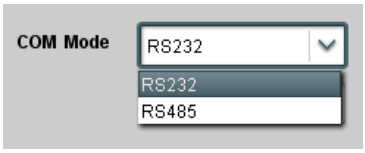
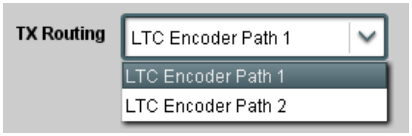
	Provides controls for setting up the two COMM (serial) ports for LTC or ANC functions, and setting comm protocol for each port.
Note: **COM 1** and **COM 2** sub-tabs provide independent controls for COM1 and COM2. Therefore, only the **COM 1** controls are described here.	
• **COM Mode (Protocol)** 	Selects serial comm protocol for the respective port as RS-232 or RS-485. **Note:** Protocol choices should consider the payload to be carried. Typically, LTC is sent or received using only RS-485 serial protocol.
• **COM Port Tx Routing Function** 	Selects port function for the respective port as LTC Encoder input or output, or ANC Data Extractor input or output.

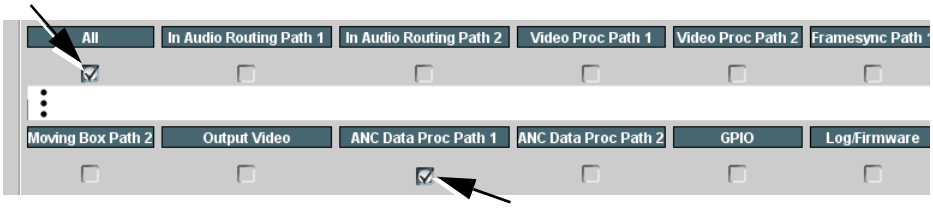
Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

Presets

Allows user control settings to be saved in a Preset and then loaded (recalled) as desired, and provides a one-button restore of factory default settings.

• Preset Layer Select

Allows selecting a functional layer (or "area of concern") that the preset is concerned with. Limiting presets to a layer or area of concern allows for highly specific presets, and masks changing card settings in areas outside of the layer or area of concern.

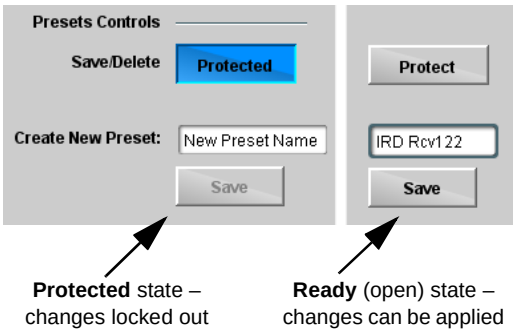


Default **All** setting will "look" at all card settings and save all settings to the defined preset with no masking.

Selecting a layer (in the example, "ANC Data Proc Path 1") will set the preset to **only** "look at" and "touch" ANC packet insertion Path 1 settings and save these settings under the preset. When the preset is loaded (recalled), the card will only "touch" the ANC packet insertion Path 1 layer.

Example: A particular usage you need may require special custom Path 1 ANC packet insertion settings that need to be invoked regardless of other cards settings. Using a layered preset set for Path 1 ANC packet insertion only allows the special custom Path 1 ANC packet insertion settings to be invoked while not disturbing any other settings.

• Preset Enter/Save/Delete



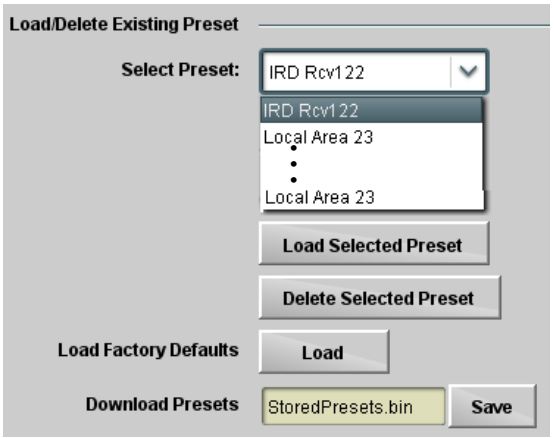
Protected state – changes locked out

Ready (open) state – changes can be applied

Locks and unlocks editing of presets to prevent accidental overwrite as follows:

- **Protect (ready):** This state awaits Protected and allows preset Save/Delete button to save or delete current device settings to the selected preset. **Use this setting when writing or editing a preset.**
- **Protected:** Toggle to this setting to lock down all presets from being inadvertently re-saved or deleted. **Use this setting when all presets are as intended.**
- **Create New Preset:** Field for entering user-defined name for the preset being saved (in this example, "IRD Rcv122").
- **Save:** Saves the current device settings under the preset name defined above.

• Preset Save/Load Controls



- **Select Preset:** drop-down allows a preset saved above to be selected to be loaded or deleted (in this example, custom preset "IRD Rcv122").
- **Load Selected Preset** button allows loading (recalling) the selected preset. When this button is pressed, the changes called out in the preset are immediately applied.
- **Delete Selected Preset** button deletes the currently selected preset.
- **Load Factory Defaults** button allows loading (recalling) the factory default preset. When this button is pressed, the changes called out in the preset are immediately applied.

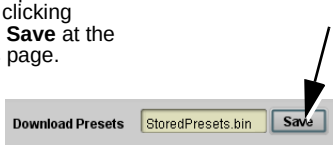
Note: Load Factory Defaults functions with no masking. The Preset Layer Select controls have no effect on this control and will reset **all** layers to factory default.

- **Download Presets** saving the preset files to a folder on the connected computer.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

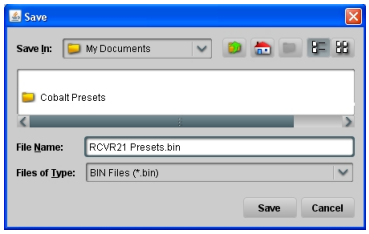
Presets	(continued)

Download (save) card presets to a network computer by clicking **Download Presets – Save** at the bottom of the Presets page.



Browse to a desired save location (in this example, *My Documents\Cobalt Presets*).

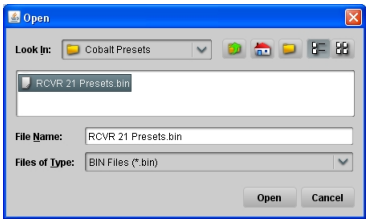
The file can then be renamed if desired (*RCVR21 Presets* in this example) before committing the save.



Upload (open) card presets from a network computer by clicking **Upload** at the bottom of DashBoard.

Browse to the location where the file was saved on the computer or drive (in this example, *My Documents\Cobalt Presets*).

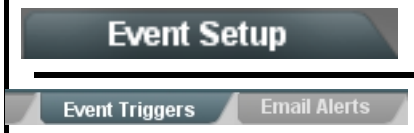
Select the desired file and click **Open** to load the file to the card.



Note: • Preset transfer between card download and file upload is on a **group** basis (i.e., individual presets cannot be downloaded or uploaded separately).

• After uploading a presets file, engagement of a desired preset is only assured by selecting and loading a desired preset as described on the previous page.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued



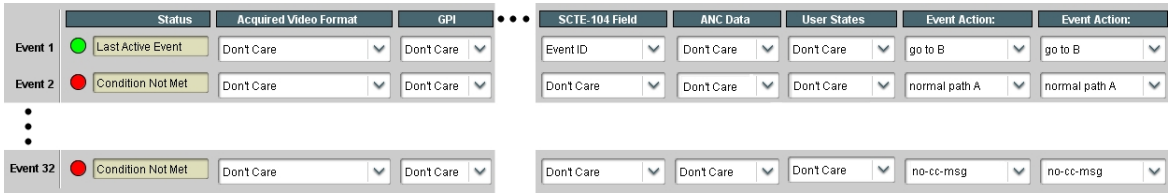
Provides event-based loading allowing a defined action to be automatically engaged upon various received signal status. Actions can be “canned” control commands or user-defined by going to a user preset.

- Event based preset loading is not passive and can result in very significant and unexpected control and signal processing changes if not properly used. If event based presets are not to be used, make certain the **Event Based Loading** button is set to **Disabled**.
- Because event based preset loading can apply control changes by invoking presets, loading conditions cannot be nested within a called preset (event-based loading settings performed here cannot be saved to presets, although the settings are persistent across power cycles).

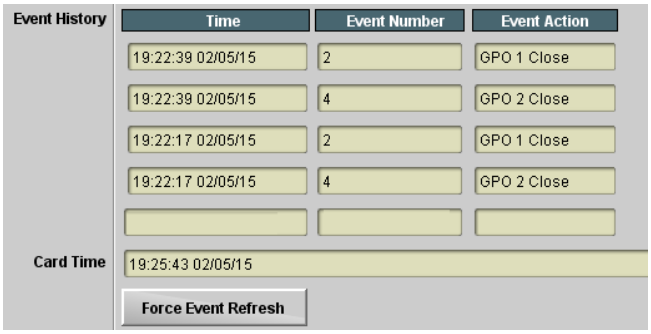
Event triggers allow a variety of event screening criteria, and in turn provide an Event Action “go to” in response to the detected event(s). For each screened criteria, categories can be set as “Don’t Care” or set to specific criteria to broaden or concentrate on various areas of concern.

- The **Event-Based Loading** button serves as a master enable/disable for the function.
- Go-to **Event Action:** can be user-defined presets, “canned” (hard-coded) selections (such as GPO triggers or routing changes), or automated E-mail alert to a respondent (see Email Alerts (p. 3-47) for setting up e-mail alerts).
- Each Event (**Event 1** thru **Event 32**) can be set to screen for any or several Definer criteria as shown in the example below. Up to 32 separate events can be defined.
- Event 1 thru Event 32 are arranged with Event 1 having the highest priority, descending down to Event 32. Where multiple event screening is enabled, lower-priority events are serviced first, with the highest-priority event being the final event serviced and last action taken as well as last item logged in the Event History (see below). This helps ensure that a lower-priority event does not mask detection of higher-priority event(s).
- The **Status** indicator and message shows the activation status of each Event. Green indicator means event is currently engaged.

Event Definers
Each event can be uniquely set up for any of the condition types in these columns. Unless set to Don’t Care, all defined conditions will need to be true in order for the Event to be considered active



Note: Event criteria settings in any row comprise an AND function. Where multiple criteria are selected, a true (trigger) condition is not propagated unless **all** specified criteria are true. To independently screen for multiple criteria, rows should be set up where each criteria is screened in its own Event row. Examples of this are shown on the following pages.



The **Event History** log shows any triggered events in groups of five most recent events (newest at the top).

In the example here, log shows Event 2 as the most recent event, and its user-selected action of GPO 1 Close.

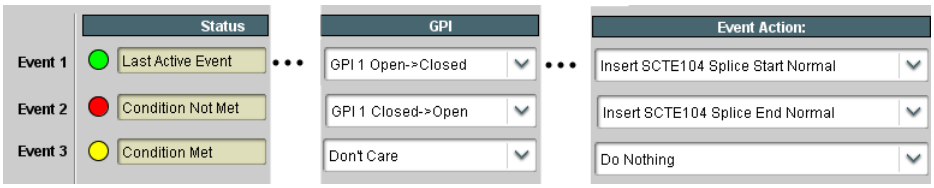
Pressing the **Force Event Refresh** button updates the list.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

(continued)

In the example here for Event 1, the **GPI** tab is set to screen for GPI 1 Open>Closed. When detected, this status can be used here to invoked an Insert SCTE 104 Splice Start Normal action.

Conversely, to activate a splice end, the revert GPI can be screened for detection.



Note: • Screened conditions are triggered upon start of event. Any event-based setup must be done in advance of the triggering event in order for event to be detected.

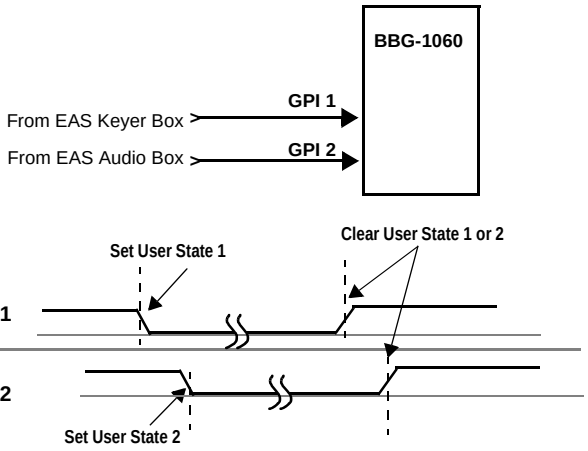
- If a desired user preset does not appear in the Event Action drop-down, press the DashBoard **Refresh** button at the bottom of the page to update the list in the drop-down.
- Loss of true conditions does not disengage an event-based triggering. A new set of true conditions must be defined and then occur to transition from one event-based trigger to another.
- Time required to engage an event-based trigger depends upon complexity of the called preset.
- Make certain all definable event conditions that the card might be expected to “see” are defined in any of the Event 1 thru Event 32 rows. This makes certain that the card will always have a defined “go-to” action if a particular event occurs. For example, if the card is expected to “see” a 720p5994 stream or as an alternate, a 525i5994 stream, make certain both of these conditions are defined (with your desired go-to presets) in any two of the Event 1 thru Event 32 condition definition rows.
- Event Actions defined using user presets must be used with care to prevent conditions that could cause looping or the removal or “override” of desired expected settings. When using presets, the Preset Layer selection should be used such that only required aspects are touched.
- Where multiple event screening is set up, the event you consider to be the highest priority should be set as higher priority than lesser events. Also, this prioritization helps ensure that all desired events are screened for before a significant change is effected.

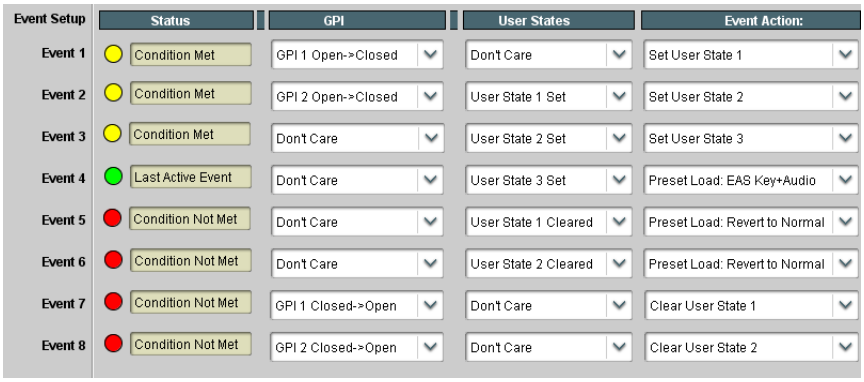
Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

(continued)

User States is a special column which allows a logic state to be set (similar to a register or latch) whenever a defined condition is first triggered. A user state (which is latched until cleared by some other definable action) can be sucessively used with other user states, thereby allowing a final action to be invoked only when subordinate user states have been sequentially satisfied as true.

In the example here, two independent units are used for an EAS alert input (one box supplies alert key video, and the other supplies automated alert audio). Both communicate their ready signal each using edge-trigger GPO's which are fed to the respective GPI 1 and GPI 2 on the card. Because these two boxes are independent and cannot be relied upon to provide coinciding triggers, a chain of user state definers are used here to engage a preset routing key video and EAS audio routing when both states from both boxes are true in the order of GPI 1 first and then GPI 2 second for this example.





Event Setup	Status	GPI	User States	Event Action:
Event 1	Condition Met	GPI 1 Open->Closed	Don't Care	Set User State 1
Event 2	Condition Met	GPI 2 Open->Closed	User State 1 Set	Set User State 2
Event 3	Condition Met	Don't Care	User State 2 Set	Set User State 3
Event 4	Last Active Event	Don't Care	User State 3 Set	Preset Load: EAS Key+Audio
Event 5	Condition Not Met	Don't Care	User State 1 Cleared	Preset Load: Revert to Normal
Event 6	Condition Not Met	Don't Care	User State 2 Cleared	Preset Load: Revert to Normal
Event 7	Condition Not Met	GPI 1 Closed->Open	Don't Care	Clear User State 1
Event 8	Condition Not Met	GPI 2 Closed->Open	Don't Care	Clear User State 2

GPI 1 (key) cue falling-edge sets user state 1

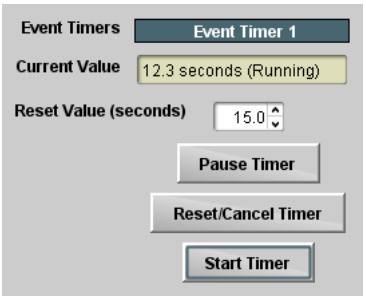
GPI 2 (audio) cue falling-edge sets user state 2

User state 2 (which requires user state 1 being true first) sets state 3, which then invokes a preset to load settings to route EAS key and audio

When either GPI 1 or GPI 2 has a rising-edge trigger (cease EAS), user states 1 or 2 are cleared, thereby clearing user state 3. Either state change calls a preset to revert to normal operation.

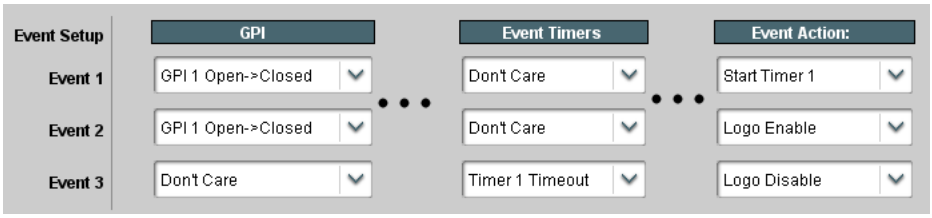
Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

Provides three general-purpose timers that can be triggered to start, pause, reset, or stop upon event actions. The state of each timer, in turn, can also be used to invoke other actions.



Event Timers 1 thru **3** (Timer 1 shown) can be set with count-down values. The Pause/Reset/Start control here are manual controls. The timers are typically used with automated cues to start and stop the timer(s), as shown below.

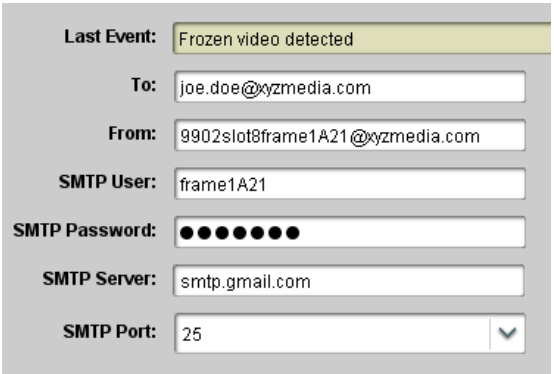
in the example here, **Event Timer 1** is used to set a logo insertion disable after a specific amount of elapsed time. A GPI inserts the logo, along with a time started at that time. Upon the timer timeout, a separate action sets logo insertion to Disabled.



Provides setup for automated Email alerts when an event has occurred.

As an Event Action choice on the Events Triggers sub-tab, an Email alert can be sent as a response. Set up email fields as shown in the example below.

Note: Frame hosting the card must be accessible to email recipient's network. It is recommended to set up and generate a test event to test the email send.



When fields are filled-in to specify recipient and sender, and email alert is selected for Event Action on Event Triggers sub-tab page, recipeient receives an email alert upon event, with the triggering event shown (in this example, "frozen video detected").

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

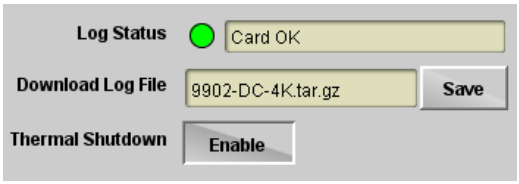
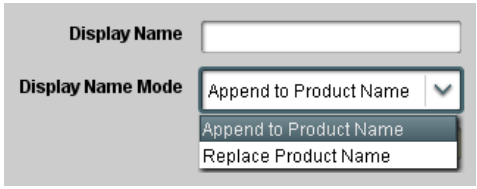
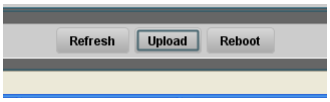
	Provides a global operating status and allows a log download for factory engineering support. Also provides controls for selecting and loading device firmware upgrade files.
• **Log Status and Download Controls** 	• **Log Status** indicates overall device internal operating status. • **Download Log File** allows a device operational log file to be saved to a host computer. This log file can be useful in case of a device error or in the case of an operational error or condition. The file can be submitted to Cobalt engineering for further analysis. • **Thermal Shutdown** enable/disable allows the built-in thermal failover to be defeated. (Thermal shutdown is enabled by default). **CAUTION** **The BBG-1060-TG2-REF1 FPGA is designed for a normal-range operating temperature around 85° C core temperature. Operation in severe conditions exceeding this limit for non-sustained usage are within device operating safe parameters, and can be allowed by setting this control to Disable. However, the disable (override) setting should be avoided under normal conditions to ensure maximum device protection.**
• **Device DashBoard Name Control** 	Allows device name In DashBoard to be changed as desired. Click return to engage change. • **Append to Product Name** appends (or adds to) existing OEM name (for example, “BBG-1060-TG2-REF1 *TestGen 1A*”). • **Replace Product Name** completely replaces the OEM name OEM name (for example, “*TestGen 1A*”). **Note:** DashBoard instance(s) may have to be refreshed before name change appears.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

Admin / System / Networking	**(continued)**
• **Firmware Upgrade Controls**	Firmware upgrade controls allow a selected firmware version (where multiple versions can be uploaded to the device's internal memory) to invoke an upgrade to a selected version either instantly, or set to install on the next device reboot (thereby allowing device upgrade downtime to be controlled at a scheduled point in time).

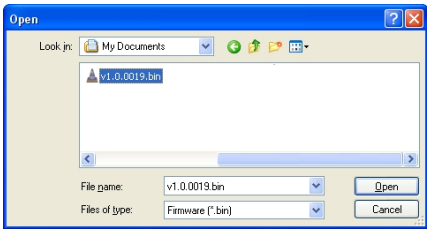
Note: The page/tab here allows managing multiple firmware versions saved on the device. New upgrade firmware from our web site can always be directly uploaded to the device without using this page. Instructions for firmware downloading to your computer and uploading to the device can be found at the **Support>Firmware Downloads** link at www.cobaltdigital.com.

1. Access a firmware upgrade file from a network computer by clicking **Upload** at the bottom of DashBoard.



2. Browse to the location of the firmware upgrade file (in this example, *My Documents\v1.0.0019.bin*).

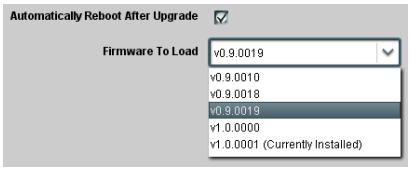
3. Select the desired file and click **Open** to upload the file to the card.



• **Immediate firmware upload.** The card default setting of **Automatically Reboot After Upgrade** checked allow a selected firmware version to be immediately uploaded as follows:

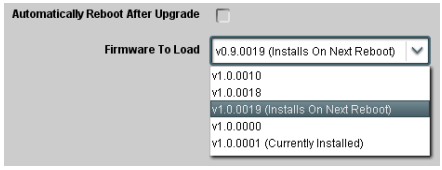
1. Click **Firmware To Load** and select the desired upgrade file to be loaded (in this example, "v1.0.0019").

2. Click **Load Selected Firmware**. The card now reboots and the selected firmware is loaded.



• **Deferred firmware upload.** With **Automatically Reboot After Upgrade** unchecked, firmware upgrade loading is held off until the card is manually rebooted. This allows scheduling a firmware upgrade downtime event until when it is convenient to experience to downtime (uploads typically take about 60 seconds).

1. Click **Firmware To Load** and select the desired upgrade file to be loaded (in this example, "v1.0.0019"). Note now how the display shows "Installs on Next Reboot".



2. Click **Load Selected Firmware**. The card holds directions to proceed with the upload, and performs the upload only when the card is manually rebooted (by pressing the **Reboot** button).

3. To cancel a deferred upload, press **Cancel Pending Upgrade**. The card reverts to the default settings that allow an immediate upload/upgrade.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

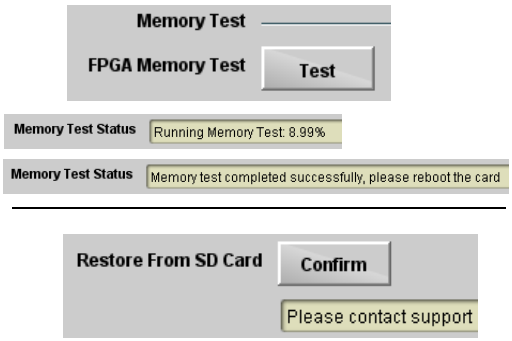
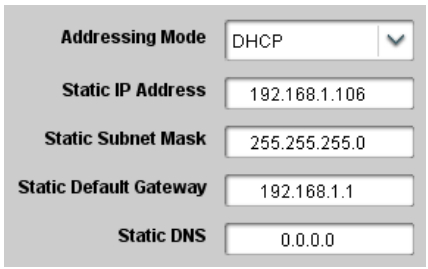
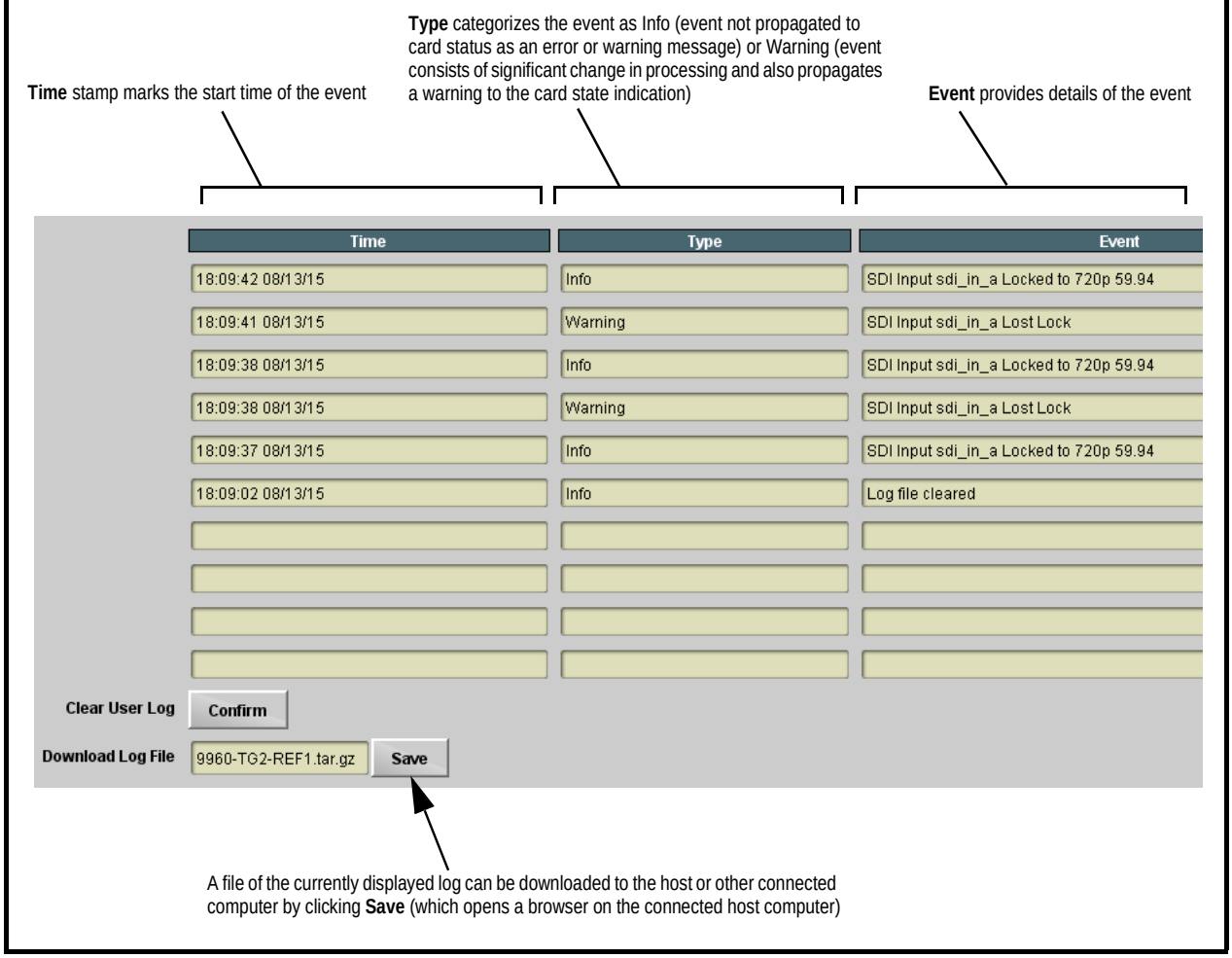
	**(continued)**
• **Device Check and Restore Utilities** 	**Memory Test** allows all cells of the device FPGA memory to be tested. This control should **only** be activated under direction of product support. Exercising the memory test is **not** part of normal device maintenance. **Restore from SD Card** allows device rendered inoperable to be restored using an SD memory card fitted to the device internal SD slot. Product support must be contacted prior to performing this operation. Use of any SD card not supplied by support can corrupt the device.
	The **Networking** sub-tab provides a dedicated Ethernet connection to card control and monitoring via a rear module Ethernet port. (This IP interface is entirely independent and separate from the card's DashBoard frame-based remote control/monitoring interface.)
• **Device IP Setup Controls** 	Provides controls for setting up device dedicated IP interface. • **Addressing Mode** selsects either DHCP or static. Where Static is selected, standard IP fields allow entry of Address, Subnet Mask, and Default Gateway.
• **Device SNMP MIB Download** 	Where supported, allows device SNMP MIB files to be downloaded and saved using user-configured name.

Table 3-2 BBG-1060-TG2-REF1 Function Menu List — continued

User Log	Provides a log of user actions and card signal input LOS conditions, with time stamp and severity level for each logged event/action.



Uploading Firmware Using Web Interface and GUI

Firmware (such as upgrades, option keys, and presets .bin files) can be uploaded to BBG-1060-TG2-REF1 directly via the web html5 interface without going through DashBoard (see Figure 3-8). In addition to allowing uploads without needing a DashBoard connection, this method transfers files typically much faster than using DashBoard.

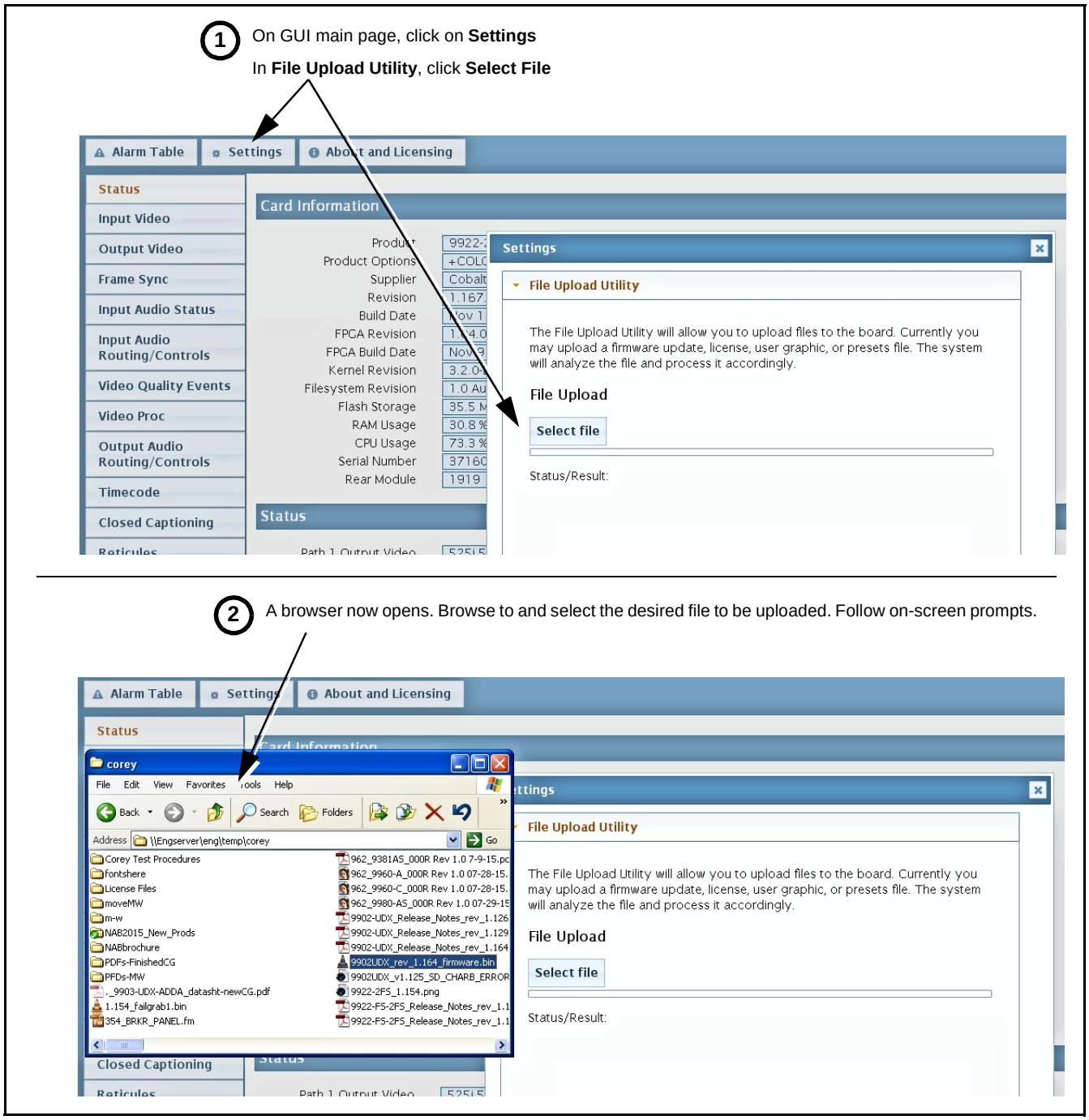


Figure 3-8 Uploads Using Web Interface/GUI

Front Panel User Menus

All of the mode and parametric controls available using the web UI (as described in BBG-1060-TG2-REF1 Function Menu List and Descriptions) are available using the front panel display and arrow navigating buttons.

The web GUI and DashBoard provide greatly simplified user interfaces as compared to using this menu and the arrow controls. For this reason, it is **strongly recommended** that the web GUI remote control or DashBoard be used for all applications other than the most basic cases.

Troubleshooting

This section provides general troubleshooting information and specific symptom/corrective action for the BBG-1060-TG2-REF1 and its remote control interface. The BBG-1060-TG2-REF1 requires no periodic maintenance in its normal operation; if any error indication (as described in this section) occurs, use this section to correct the condition.

Error and Failure Indicator Overview

The BBG-1060-TG2-REF1 itself and its remote control provide error and failure indications. Depending on how the BBG-1060-TG2-REF1 is being used (i.e, standalone or network controlled through DashBoard™ or a Remote Control Panel), check all available indications in the event of an error or failure condition.

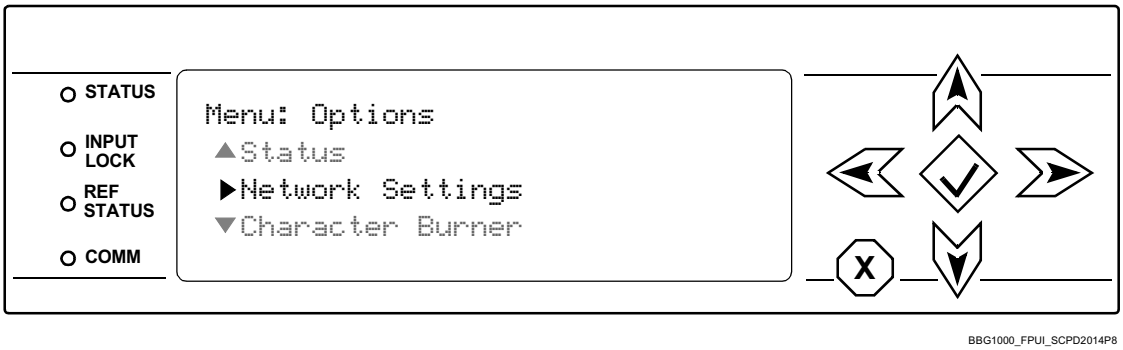
The various BBG-1060-TG2-REF1 device and remote control error and failure indicators are individually described below.

Note: The descriptions below provide general information for the various status and error indicators. For specific failures, also use the appropriate subsection listed below.

- Basic Troubleshooting Checks (p. 3-55)
- BBG-1060-TG2-REF1 Processing Error Troubleshooting (p. 3-56)

BBG-1060-TG2-REF1 Front Panel Status/Error Indicators and Display

Figure 3-9 shows and describes the BBG-1060-TG2-REF1 front panel indicators and display. These indicators and the display show status and error conditions relating to the device itself and remote (network) communications (where applicable). Because these indicators are part of the device itself and require no external interface, the indicators are particularly useful in the event of communications problems with external devices such as network remote control devices.



BBG1000_FPUI_SCPD2014P8

Item	Function
Alphanumeric Display	Shows device statuses
STATUS LED	Illuminates GREEN indicating BBG-1060-TG2-REF1 has successfully powered-up and passed self-tests.
INPUT LOCK LED	Illuminates GREEN indicating signal presence for currently-selected input video path. Illuminates ORANGE if input video is lost.
REF STATUS LED	Illuminates GREEN indicating BBG-1060-TG2-REF1 is receiving valid reference when set up for framesync operation. Illuminates ORANGE if reference is lost or incompatible with input video.
COMM LED	Illuminates GREEN when device is communicating with network connection. Illuminates ORANGE if connection is lost.
Note: The LEDs listed above are always illuminated under normal conditions. An LED that is not lit indicates an error with the device.	

Figure 3-9 BBG-1060-TG2-REF1 Device Edge Status Indicators and Display

Basic Troubleshooting Checks

Failures of a general nature (affecting many devices and/or functions simultaneously), or gross inoperability errors are best addressed first by performing basic checks before proceeding further. Table 3-3 provides basic system checks that typically locate the source of most general problems. If required and applicable, perform further troubleshooting in accordance with the other troubleshooting tables in this section.

Table 3-3 Basic Troubleshooting Checks

Item	Checks

Verify power presence and characteristics	• On the BBG-1060-TG2-REF1, in all cases when power is being properly supplied all indicators should be illuminated. Any device showing no illuminated indicators should be cause for concern.
	• Check the Power Consumed indication for the BBG-1060-TG2-REF1. This can be observed using the Status front-panel or web UI pane.
	  • If display shows **no** power being consumed, either the frame power supply, connections, or the BBG-1060-TG2-REF1 itself is defective.
	  • If display shows **excessive** power being consumed (see Technical Specifications (p. 1-15) in Chapter 1, “Introduction”), the BBG-1060-TG2-REF1 may be defective.

Check Cable connection secureness and connecting points	Make certain all cable connections are fully secure (including coaxial cable attachment to cable ferrules on BNC connectors). Also, make certain all connecting points are as intended. Make certain the selected connecting points correlate to the intended device inputs and/or outputs. Cabling mistakes are especially easy to make when working with large I/O modules.
Check status indicators and displays	On BBG-1060-TG2-REF1 front panel and web interface indicators, red indications signify an error condition. If a status indicator signifies an error, proceed to the following tables in this section for further action.
Troubleshoot by substitution	All devices can be hot-swapped, replacing a suspect device with a known-good item.

BBG-1060-TG2-REF1 Processing Error Troubleshooting

Table 3-4 provides BBG-1060-TG2-REF1 processing troubleshooting information. If the BBG-1060-TG2-REF1 exhibits any of the symptoms listed in Table 3-4, follow the troubleshooting instructions provided.

In the majority of cases, most errors are caused by simple errors where the BBG-1060-TG2-REF1 is not appropriately set for the type of signal being received by the device.

Note: Where errors are displayed on both the BBG-1060-TG2-REF1 and network remote controls, the respective indicators and displays are individually described in this section.

Table 3-4 Troubleshooting Processing Errors by Symptom

Symptom	Error/Condition	Corrective Action
BBG-1060-TG2-REF1 shows **Unlocked** message in BBG-1060-TG2-REF1 Info pane.	No video input present	Make certain intended video source is connected to appropriate BBG-1060-TG2-REF1 video input. Make certain BNC cable connections are OK.
Ancillary data (closed captioning, timecode) not transferred through BBG-1060-TG2-REF1	• Control(s) not enabled	• Make certain respective control is set to **On** or **Enabled** (as appropriate).
	• VANC line number conflict between two or more ancillary data items	• Make certain each ancillary data item to be passed is assigned a unique line number (see Ancillary Data Line Number Locations and Ranges on page 3-9).
Audio not processed or passed through device	Enable control not turned on	On **Output Audio Routing/Controls** tab, **Audio Group Enable** control for group 1 thru 4 must be turned on for sources to be embedded into respective embedded channel groups.
Selected upgrade firmware will not upload	Automatic reboot after upgrade turned off	Device **Presets** > **Automatically Reboot After Upgrade** box unchecked. Either reboot the device manually, or leave this box checked to allow automatic reboot to engage an upgrade upon selecting the upgrade.
Device does not pass video or audio as expected. Control settings spontaneously changed from expected settings.	Event-based preset inadvertently invoked	Event-based preset loading should be set to **Disabled** if this function is not to be used. Read and understand this control description before using these controls to make sure engagement for all expected conditions is considered. See Event Setup Controls (p. 3-44) for more information.
Device will not retain user settings, or setting changes or presets spontaneously invoke.	**Event Based Loading** sub-tab inadvertently set to trigger on event	If event based loading is not to be used, make certain **Event Based Loading** is disabled (either using master **Enable/Disable** control or through events settings. See Event Setup Controls (p. 3-44) for more information.

In Case of Problems

Recovering Card From SD Memory Card

New production cards come equipped with an SD card installed in a slot receptacle on the underside of the card. The data on this SD card can be used to restore a card should the card become unresponsive (can't communicate with DashBoard or other remote control). Recovering a card using the procedure here will restore the card to any installed option licenses and the most recent firmware installed.

1. (See Figure 3-10.) Make certain the card has the proper SD card installed in the under-card slot. If SD card is **not** installed, contact Product Support to obtain an SD card.

Note: If unit is a BBG-1000 Series device, remove the top cover before proceeding.

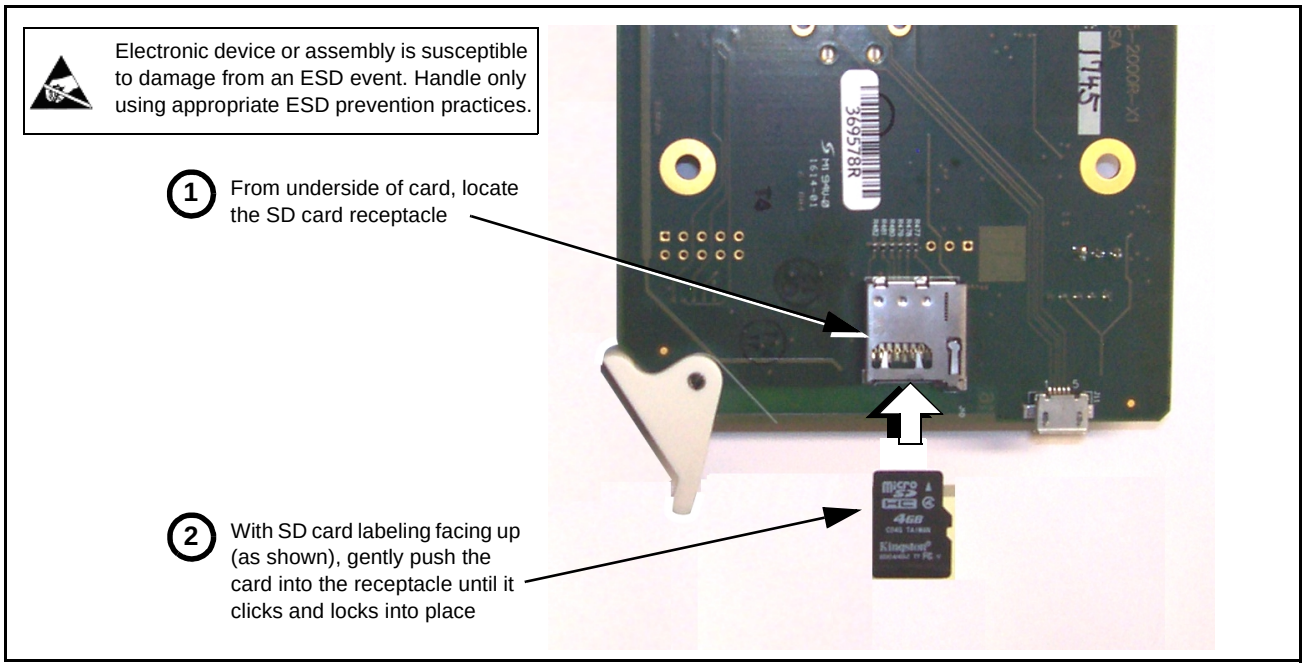


Figure 3-10 SD Card Installation

2. (See Figure 3-11.) With card powered-down, locate the **MMC BOOT** button on the card. Proceed as shown in picture.

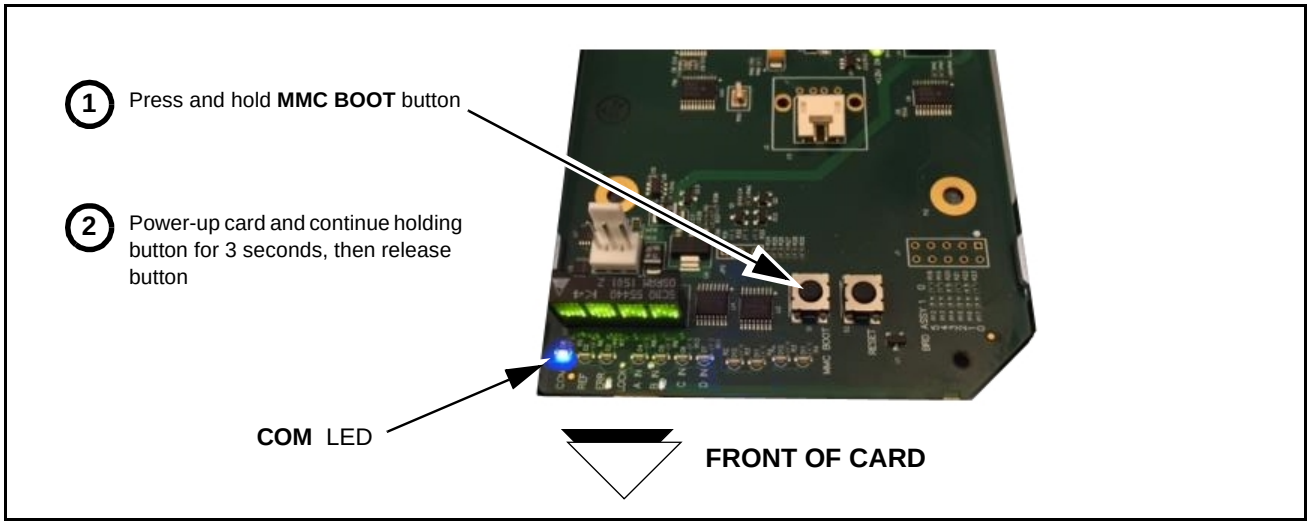


Figure 3-11 MMC Boot Button

3. With button now released, the card will begin reprogramming:
   - **COM** LED illuminates and remains illuminated.
   - When reprogram is complete, **COM** LED turns off, on, and then off again (entire process takes about 1-1/2 minute).
4. Remove power from the card (remove card from slot or power-down BBG-1000 Series unit).
5. Re-apply power to the card. The card/device will display as "***UNLICENSED***" in DashBoard/remote control.
6. In Dashboard or web remote control, go to **Admin** tab and click **Restore from SD Card**. After about 1/2-minute, the card license(s) will be restored and card will be using its most recently installed firmware.
7. Card/device can now be used as normal. On BBG-1000 Series unit, re-install top cover.

Contact and Return Authorization

Should any problem arise with this product that was not solved by the information in this section, please contact the Cobalt Digital Inc. Technical Support Department.

If required, a Return Material Authorization number (RMA) will be issued to you, as well as specific shipping instructions. If required, a temporary replacement item will be made available at a nominal charge. Any shipping costs incurred are the customer's responsibility. All products shipped to you from Cobalt Digital Inc. will be shipped collect.

The Cobalt Digital Inc. Technical Support Department will continue to provide advice on any product manufactured by Cobalt Digital Inc., beyond the warranty period without charge, for the life of the product.

See Contact Cobalt Digital Inc. (p. 1-13) in Chapter 1, "Introduction" for contact information.

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