

COBALT[®]

BBG-1050-EMDE-ANC



**3G/HD/SD-SDI Standalone Ancillary Data
Embedder/De-Embedder**

Product Manual



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PRELIMINARY

BBG1050EMDEANC-OM (V1.0P)

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Congratulations on choosing the Cobalt[®] BBG-1050-EMDE-ANC 3G/HD/SD-SDI Standalone Ancillary Data Embedder/De-Embedder. The BBG-1050-EMDE-ANC 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-1050-EMDE-ANC, please contact us at the contact information on the front cover.

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Introduction

Overview

This manual provides installation and operating instructions for the BBG-1050-EMDE-ANC 3G/HD/SD-SDI Standalone Ancillary Data Embedder / De-Embedder unit (also referred to herein as the BBG-1050-EMDE-ANC).

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-1050-EMDE-ANC.
- **Chapter 2, “Installation”** – Provides instructions for installing the BBG-1050-EMDE-ANC and setting up its network access.
- **Chapter 3, “Setup/Operating Instructions”** – Provides overviews of operating controls and instructions for using the BBG-1050-EMDE-ANC.

This chapter contains the following information:

- **Cobalt Reference Guides (p. 1-2)**
- **Manual Conventions (p. 1-2)**
- **Safety Summary (p. 1-4)**
- **BBG-1050-EMDE-ANC Functional Description (p. 1-5)**
- **Technical Specifications (p. 1-6)**
- **Warranty and Service Information (p. 1-8)**
- **Contact Cobalt Digital Inc. (p. 1-9)**

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-1050-EMDE-ANC itself. Examples are provided below.

- Device display messages are shown like this:

BBG-1050-EMDE-ANC

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

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

- **BBG-1050-EMDE-ANC** refers to the BBG-1050-EMDE-ANC 3G/HD/SD-SDI Standalone Ancillary Data Embedder / De-Embedder.
- **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-1050-EMDE-ANC 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

	<p>Important note regarding product usage. Failure to observe may result in unexpected or incorrect operation.</p>
	<p>Electronic device or assembly is susceptible to damage from an ESD event. Handle only using appropriate ESD prevention practices.</p> <p>If ESD wrist strap is not available, handle only by edges and avoid contact with any connectors or components.</p>
	<p>Symbol (WEEE 2002/96/EC)</p> <p>For product disposal, ensure the following:</p> <ul style="list-style-type: none"> • Do not dispose of this product as unsorted municipal waste. • Collect this product separately. • Use collection and return systems available to you.

Safety 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-1050-EMDE-ANC 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.

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-1050-EMDE-ANC Functional Description

Figure 1-1 shows a functional block diagram of the BBG-1050-EMDE-ANC. This function provides full VANC/HANC ancillary data de-embedding and embedding for 3G/HD/SD-SDI streams. Direct access to DID and SDID locations allows extraction or insertion of user data such as camera PTZ, SCTE 104, closed-captioning read/insert, or other specialized user payloads. Data can be extracted and inserted to and from the SDI stream via serial or IP interfaces connecting to external devices/systems. A rear I/O module with a dedicated IP port can be used with the ancillary data processor function for data insertion or extraction via IP. In addition to ANC embed/de-embed over external IP or serial media, the BBG-1050-EMDE-ANC also provides SMPTE 337 embed/de-embed, allowing serial user data to be embedded and de-embedded over unused embedded audio pairs.

BBG-1050-EMDE-ANC Input/Outputs

The BBG-1050-EMDE-ANC provides the following inputs and outputs:

- **3G/HD/SD SDI IN A** – 3G/HD/SD-SDI input
- **3G/HD/SD-SDI OUT (1-2)** – two 3G/HD/SD-SDI processed video outputs
- **COM A** thru **COM D**– four RS-485 Tx/Rx serial ports
- **ETHERNET** – 10/100Base-T Ethernet port
- **SMPTE 337 Data Over Audio** interfaces

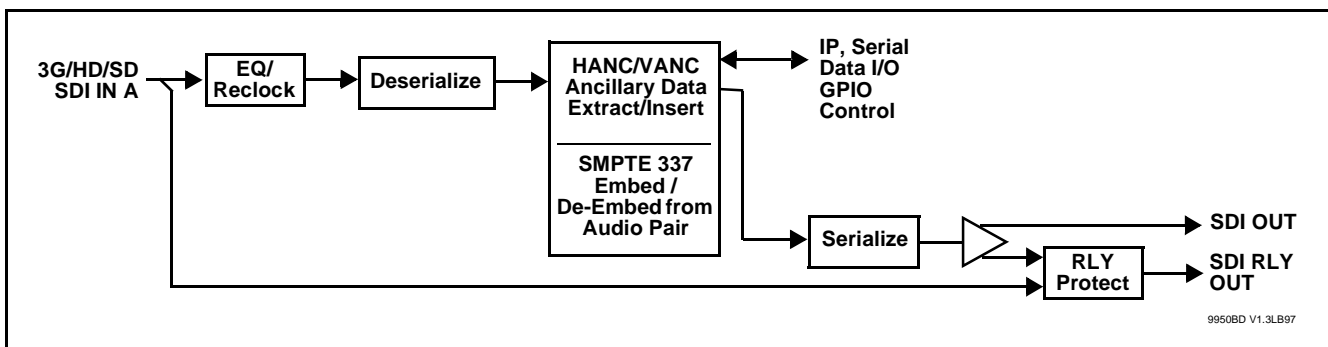


Figure 1-1 BBG-1050-EMDE-ANC Functional Block Diagram

Ancillary Data Input/Output Interfaces

Serial (COMM) Ports

The BBG-1050-EMDE-ANC is equipped with four, 3-wire serial ports (**COM 1 - COM 4**). The ports provide for embedding or de-embedding via the Ancillary Data Processor for data insertion or extraction. Modes allow for extraction/insertion of entire packets, or payload only. Sync and rate controls allow the BBG-1050-EMDE to coordinate insertion or extraction with external systems. Status indicators are provided which show Tx/Rx OK status and bit rate.

IP (Ethernet) Port

Separate Tx and Rx controls are provided to set the address and port for Tx and Rx, and set the protocol (UDP, TCP) for Tx and Rx. Modes allow for extraction/insertion of entire packets, or payload only.

Port can be configured to send ACK packets back to a sending source when receiving IP-based insertion data. The port can also be configured to send heartbeat packets to keep external connections open if required. Status indicators are provided which show Tx/Rx OK status, IP address of external connections, bit rate, and total running data amount sent or received.

SMPTE 337 Data Embed / De-Embed

SMPTE 337/338/339 non-PCM data can be embedded and de-embedded on embedded audio pairs, offering a very convenient self-contained transport within the program stream physical media. An unused embedded audio pair serves as the media between two EMDE-ANC devices wherein user data (from external serial interfaces) can use the embedded pair between sending and receiving serial nodes.

User Control Interface

BBG-1050-EMDE-ANC 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-1050-EMDE-ANC 3G/HD/SD-SDI Standalone Ancillary Data Embedder / De-Embedder unit.

Table 1-1 *Technical Specifications*

Item	Characteristic
Part number, nomenclature	• BBG-1050-EMDE-ANC 3G/HD/SD-SDI Standalone Ancillary Data Embedder / De-Embedder
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

Table 1-1 Technical Specifications — continued

Item	Characteristic
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.
Serial Digital Video Input	Number of Inputs: (1); Input uses relay bypass to output directly to RLY OUT in case of loss of power. Data Rates Supported: SMPTE 424M, 292M, SMPTE 259M-C Impedance: 75 Ω terminating Return Loss: > 15 dB up to 1.485 GHz > 10 dB up to 2.970 GHz
Post-Processor Serial Digital Video Outputs	Number of Outputs: Two 3G/HD/SD-SDI BNC (RLY OUT is passive relay bypass protected) Impedance: 75 Ω Return Loss: > 15 dB at 5 MHz – 270 MHz Signal Level: 800 mV \pm 10% DC Offset: 0 V \pm 50 mV Jitter (3G/HD/SD): < 0.3/0.2/0.2 UI Minimum Latency: SD: 127 pixels; 9.4 us 720p: 330 pixels; 4.45 us 1080i: 271 pixels; 3.65 us 1080p: 361 pixels; 2.43 us

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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Contact Cobalt Digital Inc.

Feel free to contact our thorough and professional support representatives for any of the following:

- Name and address of your local dealer
- Product information and pricing
- Technical support
- Upcoming trade show information

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Installation

Overview

This chapter contains the following information:

- Installing the BBG-1050-EMDE-ANC (p. 2-1)
- Rear Panel Connections (p. 2-2)

Installing the BBG-1050-EMDE-ANC

- Note:**
- Where BBG-1050-EMDE-ANC 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-1050-EMDE-ANC in locations marked with stamped “x”. If feet are not affixed, chassis bottom cooling vents will be obscured.
 - Where BBG-1050-EMDE-ANC 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-1050-EMDE-ANC to be mounted and securely attached to a 1 RU tray that fits into a standard EIA 19” rack mounting location. Install BBG-1050-EMDE-ANC unit into tray as described and shown here.

1. If installing BBG-1050-EMDE-ANC using optional frame Mounting Tray BBG-1000-TRAY, install BBG-1050-EMDE-ANC in tray as shown in Figure 2-1.
2. Connect the input and output cables as shown in Figure 2-3.

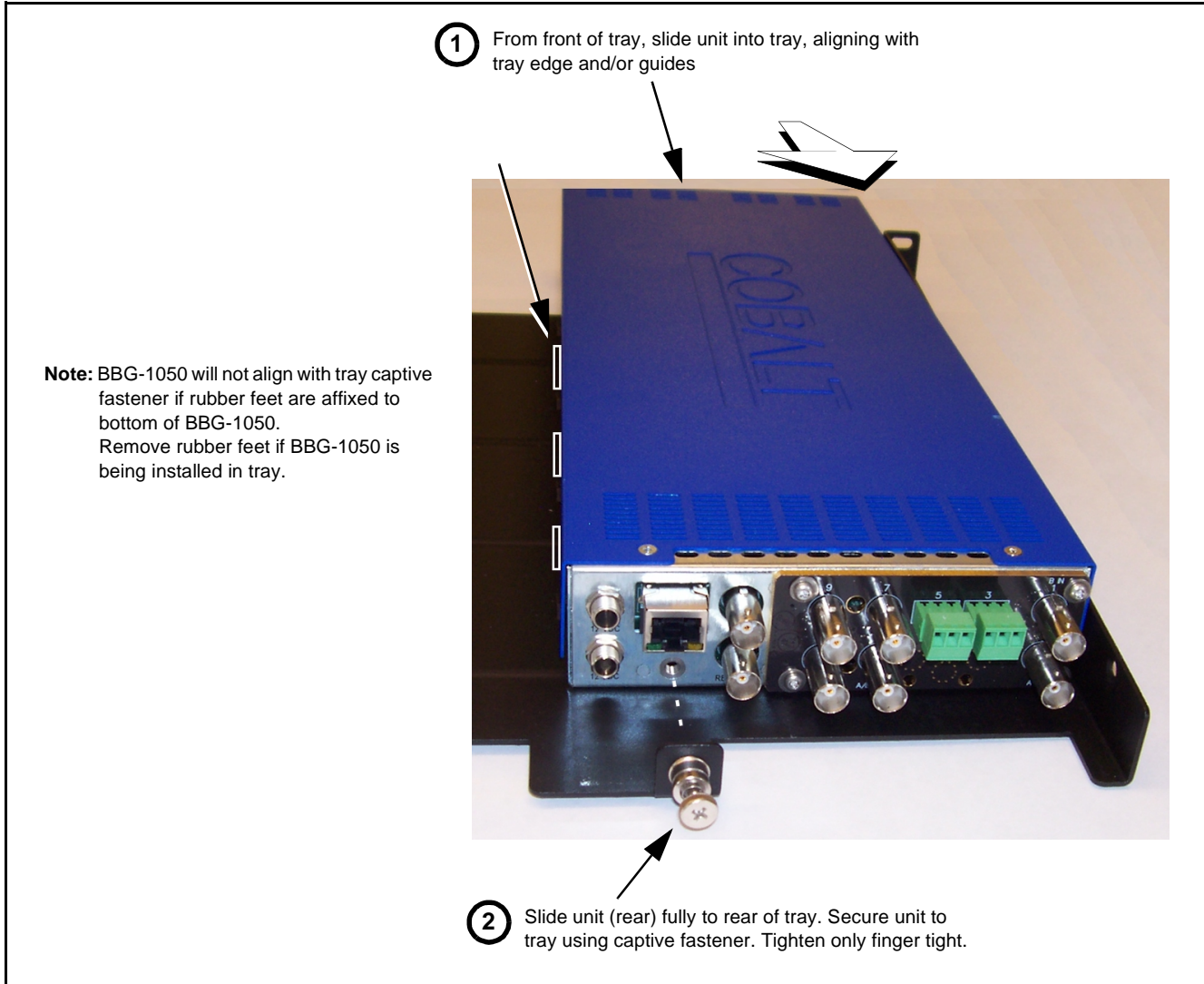


Figure 2-1 Mounting BBG-1050-EMDE-ANC Using Frame Mounting Tray

BBG-1050-EMDE-ANC Unit Dimensions

Figure 2-2 shows the BBG-1050-EMDE-ANC physical dimensions and mounting details for cases where BBG-1050-EMDE-ANC 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-1050-EMDE-ANC 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.

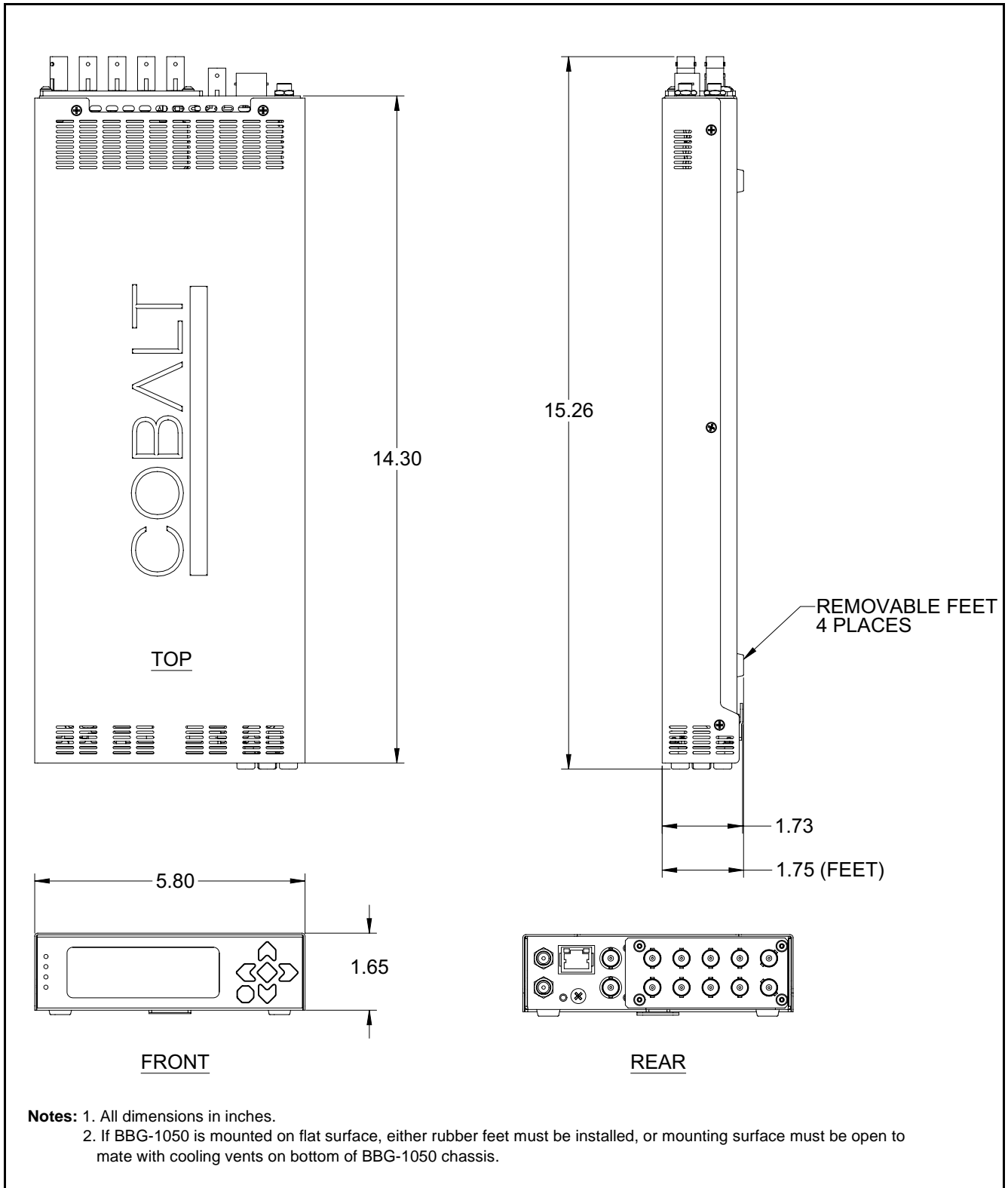


Figure 2-2 BBG-1050-EMDE-ANC Dimensional Details

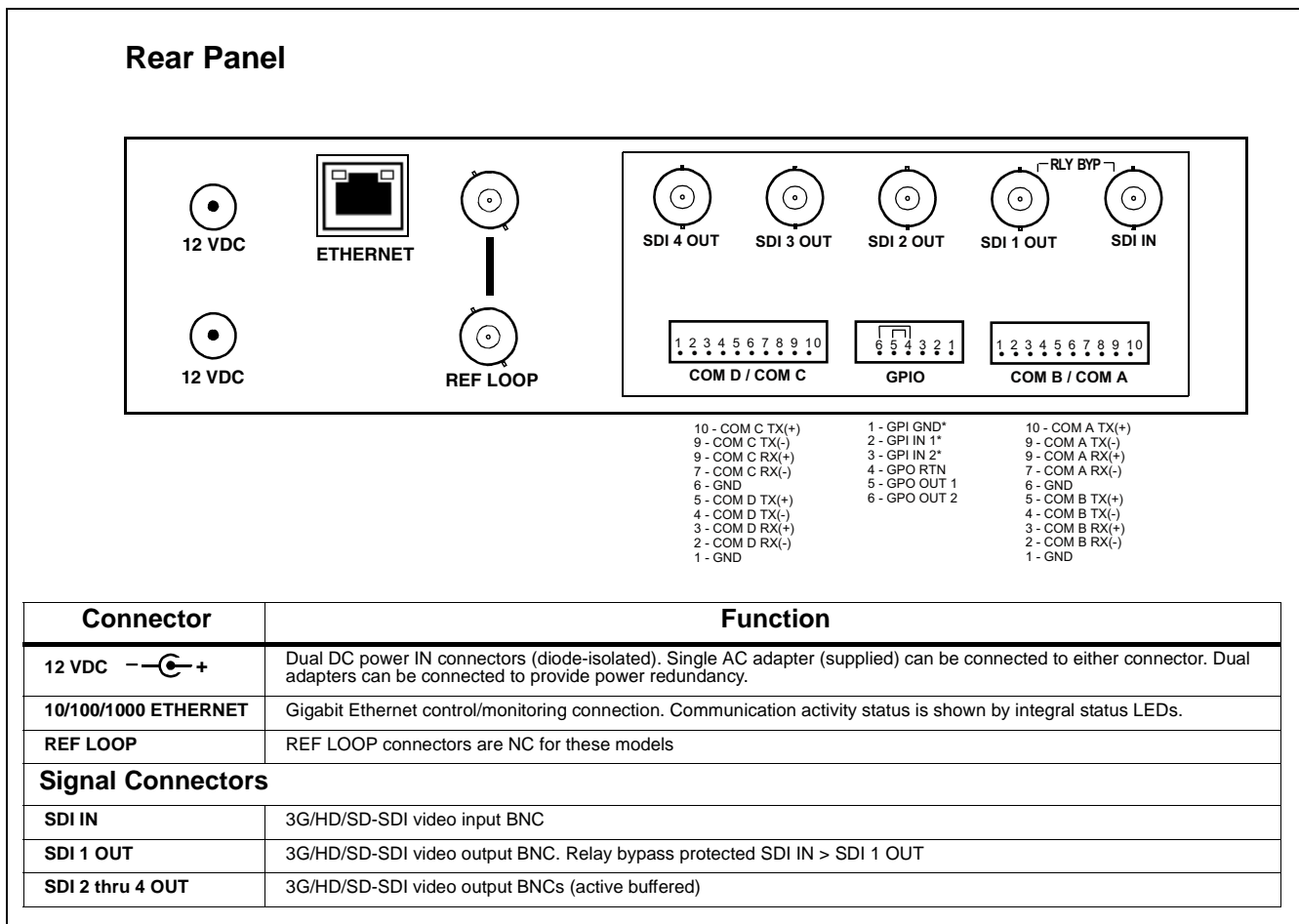


Figure 2-3 BBG-1050-EMDE-ANC Rear Panel Connectors

Setup/Operating Instructions

Overview

This chapter contains the following information:

- BBG-1050-EMDE-ANC Front Panel Display and Menu-Accessed Control (p. 3-1)
- Connecting BBG-1050-EMDE-ANC To Your Network (p. 3-3)
- Control and Display Descriptions (p. 3-5)
- Checking BBG-1050-EMDE-ANC Device Information (p. 3-8)
- BBG-1050-EMDE-ANC Function Menu List and Descriptions (p. 3-9)
- Uploading Firmware Using Web Interface and GUI (p. 3-28)
- Front Panel User Menus (p. 3-29)
- Troubleshooting (p. 3-30)

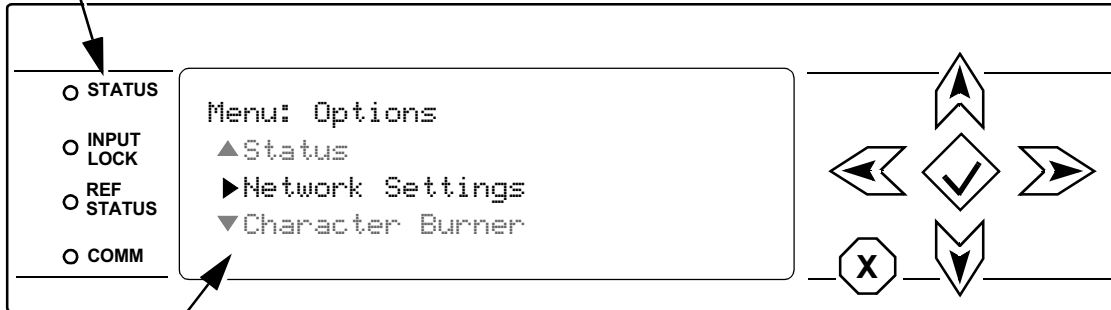
Perform the setup procedures here in the sequence specified. All procedures equally apply to all models unless otherwise noted.

Note: All instructions here assume BBG-1050-EMDE-ANC is physically connected to the control physical network as described in Chapter 2. Installation.

BBG-1050-EMDE-ANC Front Panel Display and Menu-Accessed Control

Figure 3-1 shows and describes the BBG-1050-EMDE-ANC 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

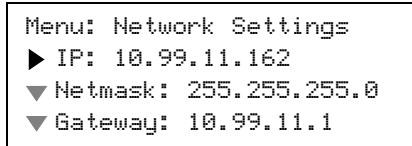
Alphanumeric display shows configuration items, and shows and allows changes of settings when a menu item is accessed.

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

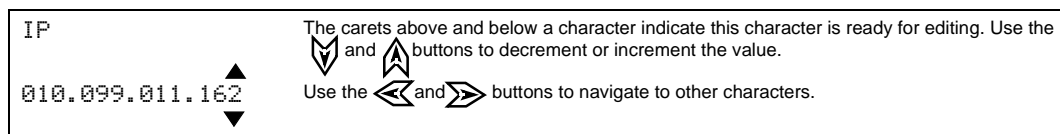
▶ arrows denotes a menu item is accessed to be selected (in the example above, **Network Settings**).

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:



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



To exit a sub-menu or a menu, press the 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-1050-EMDE-ANC Front Panel Display and Menu Controls

Connecting BBG-1050-EMDE-ANC To Your Network

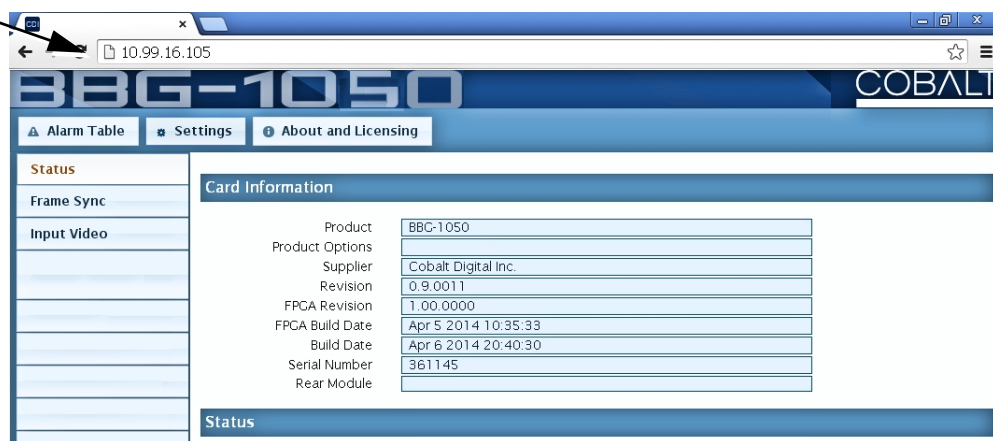
BBG-1050-EMDE-ANC ships with network protocol set to DHCP and populates its address with an address allocated by your DHCP server. If your network does not have a DHCP server, the BBG-1050-EMDE-ANC address field will be blank, and a static address must then be assigned. All initial network settings are 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-1050-EMDE-ANC To Network

1. Power-up BBG-1050-EMDE-ANC and connect Ethernet cable connection to media. Wait for BBG-1050-EMDE-ANC to complete booting.
When **Product: BBG-1050 ...** 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  to commit changes and exit the setup menu.  
**Note:** Current IP address of BBG-1050-EMDE-ANC can now be checked from the front panel by accessing this at any point.
  6. At this point, BBG-1050-EMDE-ANC can now be accessed with a web browser pointing to the configured address. Browse to the configured address and check connectivity.

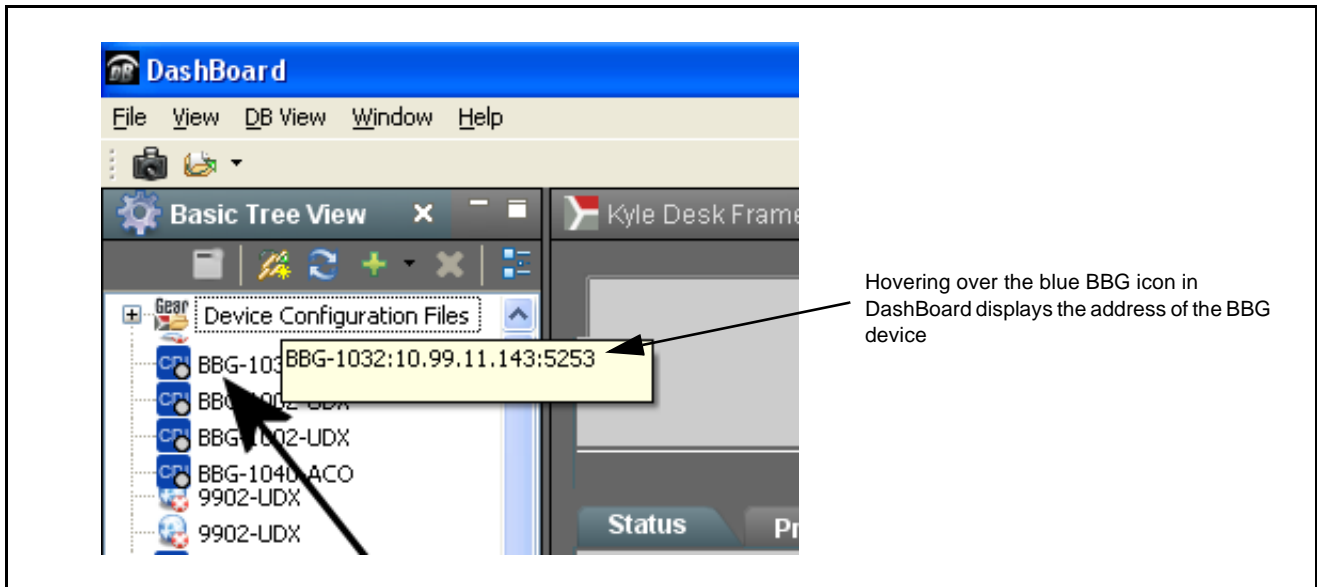
Web browser pointing to configured address displays BBG-1050-EMDE-ANC



## Finding a BBG-1050-EMDE-ANC Device in DashBoard

(See Figure 3-2) If BBG-1050-EMDE-ANC is configured with an address within a network also available via DashBoard, a BBG-1050-EMDE-ANC device appears as a frame entity in the DashBoard Basic Tree View.

**Note:** BBG-1050-EMDE-ANC DashBoard remote control is also available by opening the device in DashBoard similar to opening an openGear® card.



**Figure 3-2 Finding BBG-1050-EMDE-ANC Using DashBoard**

## Control and Display Descriptions

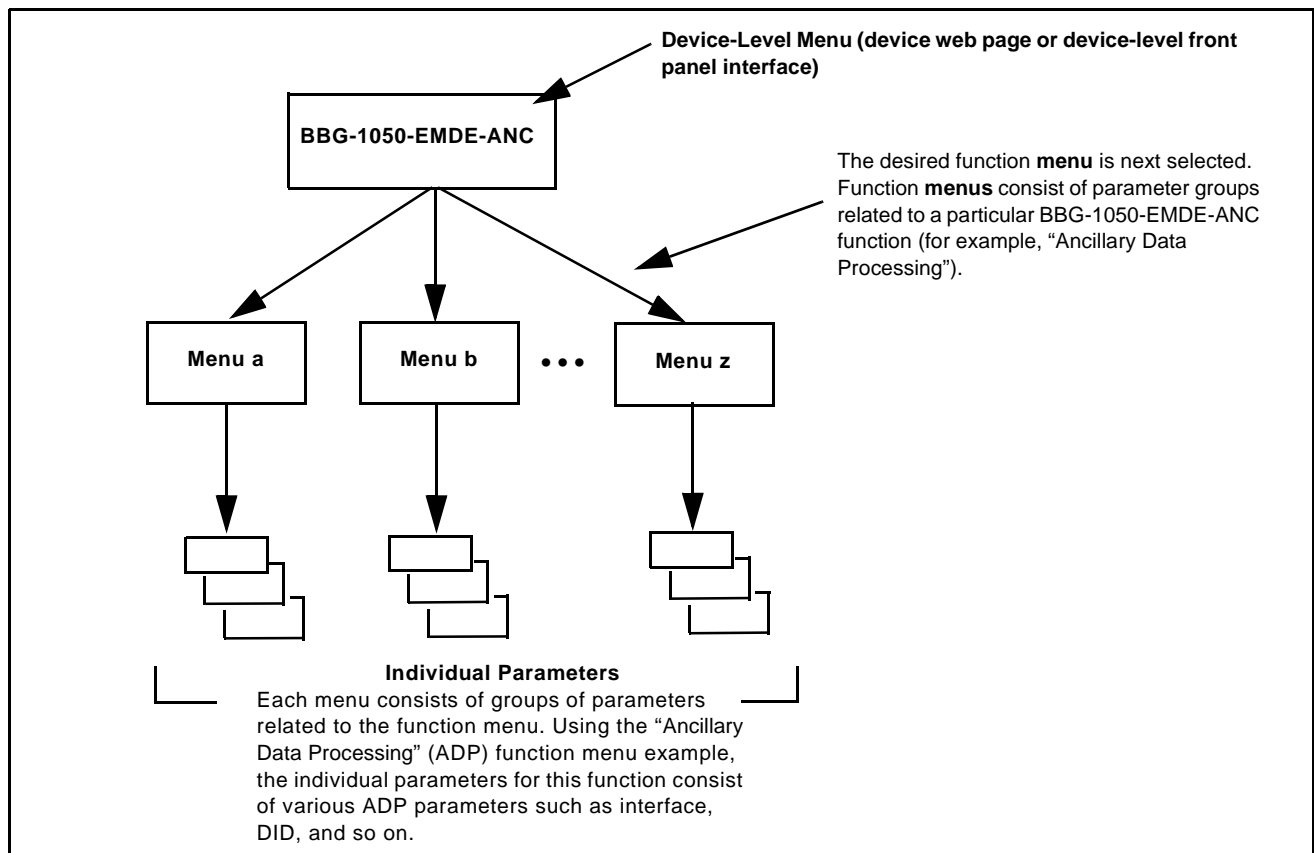
This section describes the web user interface controls for using the BBG-1050-EMDE-ANC.

The format in which the BBG-1050-EMDE-ANC 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-1050-EMDE-ANC device are organized into function **menus**, which consist of parameter groups as shown below.

Figure 3-3 shows how the BBG-1050-EMDE-ANC 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.

The screenshot shows a web browser window with the URL 10.99.16.105. The page title is BBG-1002 and the logo for COBALT is visible. On the left, there is a 'Main Menu Navigation Tabs' sidebar with options: Status, Frame Sync (selected), Input Video, Output Audio Routing, Timecode, Character Burner, Moving Box, GPIO, Scaler, AFD/WSS/VI, Closed Captioning, YC Alignment, Log Status, Input Audio Status, Presets, Video Quality Events, and Input Audio Routing/Controls. The main content area, titled 'Typical Drop-Down Selector', contains several settings: Lock Mode (Free Run), Output Rate (Auto), Initial Startup Format (525i59.94), Output Mode (Input Video), On Loss of Video (Freeze), and Test Pattern (Tartan). A 'Drop-Down Expansion' shows the 'Free Run' options: Reference 1 else Free Run, Lock to Input else Free Run, and Free Run. Below these are sliders for Vertical Lines (0), Horizontal (us) (0.000), and Frame Delay (1). A 'Typical Status Display' shows Report Delay (29.35 ms / 1 frames 854 lines) and Lock Status (Framesync Free Running). A 'Typical Parametric Control' is also indicated.

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-1050-EMDE-ANC user interface theme selection offers light and dark themes suited for various users and environments.

Clicking **Settings** opens a pane where the display **Theme** can be set



The screenshot shows the BBG-1002 web interface. At the top, there are tabs for 'Alarm Table', 'Settings', and 'About and Licensing'. The 'Settings' tab is active. On the left, there is a sidebar menu with options like 'Status', 'Frame Sync', 'Input Video', 'Output Audio Routing', 'Timecode', 'Character Burner', 'Moving Box', 'GPIO', and 'Scaler'. The main content area shows 'Lock Mode' set to 'Free Run'. Below this, the 'Settings' pane is open, showing a 'Theme' section with two options: 'Dark' and 'Light'. The 'Dark' theme description says: 'Use the dark theme for a dimly lit control room or studio. This theme will try to make use of darker shades of gray, so when monitoring, the user interface will not overwhelm the room with light.' The 'Light' theme description says: 'Use the light theme for a normally lit office or laboratory.'



**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 Web UI Display Themes

## Checking BBG-1050-EMDE-ANC Device Information

The operating status and software version the BBG-1050-EMDE-ANC device can be checked by clicking the **Status** main menu tab. Figure 3-6 shows and describes the BBG-1050-EMDE-ANC 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. 3-30) for corrective action.

**Device Info Display**  
This display shows the the device hardware and software version info.

**Status Display**  
This displays shows the status and format of the signals being received by the BBG-1050-EMDE-ANC, as well as device status.

| Card Information |                     |
|------------------|---------------------|
| Product          | BBG-1002-UDX        |
| Product Options  | +LTC                |
| Supplier         | Cobalt Digital Inc. |
| Revision         | 0.9.0011            |
| FPGA Revision    | 1.00.0000           |
| FPGA Build Date  | Apr 5 2014 10:35:33 |
| Build Date       | Apr 6 2014 20:40:30 |
| Serial Number    | 361145              |
| Rear Module      |                     |


| Status          |                                                                           |
|-----------------|---------------------------------------------------------------------------|
| SDI Input A     | <span style="color: green;">●</span> 720p_5994, OK Time 2:37:06, 0 Errors |
| SDI Input B     | <span style="color: yellow;">●</span> Unlocked                            |
| SDI Input C     | <span style="color: yellow;">●</span> Unlocked                            |
| SDI Input D     | <span style="color: yellow;">●</span> Unlocked                            |
| GPI1            | <span style="color: green;">●</span> Open                                 |
| GPI2            | <span style="color: green;">●</span> Open                                 |
| Reference 1     | <span style="color: yellow;">●</span> Unlocked                            |
| Card Voltage    | 11.53 V                                                                   |
| Card Power      | 20.63 W                                                                   |
| Card Temp Front | 29.4 C                                                                    |
| Card Temp Rear  | 61.3 C                                                                    |
| Card Temp FPGA  | 61.0 C amb 70.0 C core                                                    |
| Card Up Time    | 02:37:12                                                                  |

Figure 3-6 Typical Web GUI Device Info/Status Utility

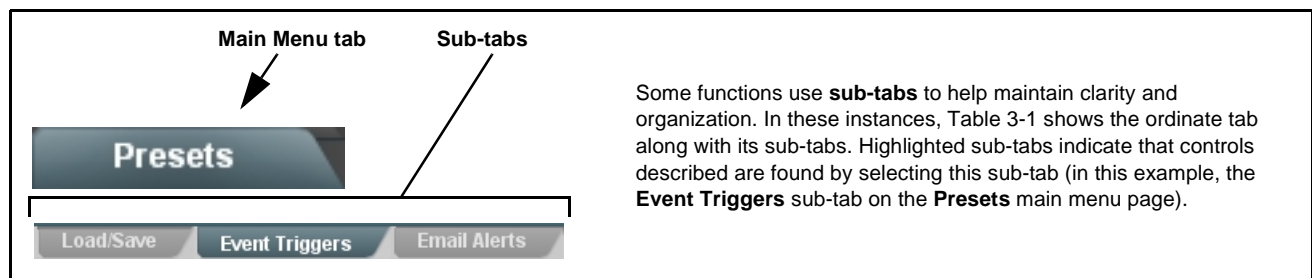


## BBG-1050-EMDE-ANC Function Menu List and Descriptions

Table 3-1 individually lists and describes each BBG-1050-EMDE-ANC function menu item and its related list selections, controls, and parameters. Where helpful, examples showing usage of a function are also provided.

- Note:**
- All numeric (scalar) parameters displayed can be changed using the slider controls,  arrows, or by numeric keypad entry in the corresponding numeric field. (When using numeric keypad entry, add a return after the entry to commit the entry.)
  - User interface depictions here may show Dashboard UI. Web UI are similar.



On the web GUI itself and in Table 3-1, the function menu items are organized using main menu tabs as shown below.



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

| Function Menu Item            | Page | Function Menu Item                                   | Page |
|-------------------------------|------|------------------------------------------------------|------|
| Output Video Mode Controls    | 3-10 | COMM Ports Setup Controls                            | 3-19 |
| Input Audio Status            | 3-10 | Presets                                              | 3-21 |
| Timecode                      | 3-11 | Admin (Log Status/Firmware Update - Card IP Address) | 3-27 |
| Output Audio Routing/Controls | 3-15 | User Log                                             | 3-27 |
| Ancillary Data Proc Controls  | 3-16 |                                                      |      |

Table 3-1 BBG-1050-EMDE-ANC Function Menu List



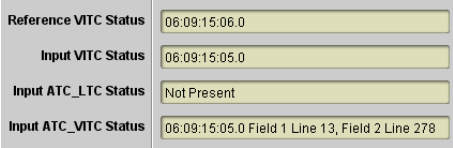
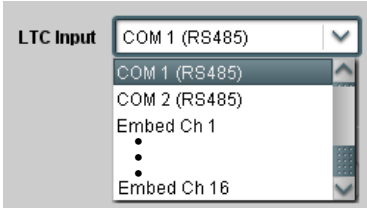


|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>(This tab allows selection of output video for device SDI outputs. It is currently locked to <b>Anc Data</b> processed output for all <b>SDI OUT (1 thru 4)</b> drop-downs.)</p> |                   |        |      |         |               |      |         |               |                   |         |               |                   |         |               |                   |          |               |                 |           |               |                   |           |               |                 |           |               |                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------|------|---------|---------------|------|---------|---------------|-------------------|---------|---------------|-------------------|---------|---------------|-------------------|----------|---------------|-----------------|-----------|---------------|-------------------|-----------|---------------|-----------------|-----------|---------------|----------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>Displays signal status and payload for embedded and discrete audio received by the device.</p>                                                                                   |                   |        |      |         |               |      |         |               |                   |         |               |                   |         |               |                   |          |               |                 |           |               |                   |           |               |                 |           |               |                |
| <p>Individual signal status and peak level displays for embedded audio input pairs as described below.</p> <ul style="list-style-type: none"> <li>• <b>Absent:</b> Indicates embedded channel does not contain recognized audio PCM data.</li> <li>• <b>Present - PCM:</b> Indicates embedded channel pair contains recognized audio PCM data.</li> <li>• <b>Dolby E:</b> Indicates embedded channel pair contains Dolby® E encoded data.</li> <li>• <b>Dolby Digital:</b> Indicates embedded channel pair contains Dolby® Digital encoded data.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• Dolby status displays occur only for valid Dolby® signals meeting SMPTE 337M standard.</li> <li>• Embedded pair carrying non-PCM data other than Dolby may indicate Absent.</li> </ul> |                                                                                                                                                                                     |                   |        |      |         |               |      |         |               |                   |         |               |                   |         |               |                   |          |               |                 |           |               |                   |           |               |                 |           |               |                |
| <table border="1"> <thead> <tr> <th></th> <th>Status</th> <th>Peak</th> </tr> </thead> <tbody> <tr> <td>Emb 1-2</td> <td>Dolby Digital</td> <td>Data</td> </tr> <tr> <td>Emb 3-4</td> <td>Present - PCM</td> <td>-80 dBFS/-80 dBFS</td> </tr> <tr> <td>Emb 5-6</td> <td>Present - PCM</td> <td>-80 dBFS/-80 dBFS</td> </tr> <tr> <td>Emb 7-8</td> <td>Present - PCM</td> <td>-20 dBFS/-20 dBFS</td> </tr> <tr> <td>Emb 9-10</td> <td>Present - PCM</td> <td>0 dBFS/-20 dBFS</td> </tr> <tr> <td>Emb 11-12</td> <td>Present - PCM</td> <td>-14 dBFS/-10 dBFS</td> </tr> <tr> <td>Emb 13-14</td> <td>Present - PCM</td> <td>-9 dBFS/-5 dBFS</td> </tr> <tr> <td>Emb 15-16</td> <td>Present - PCM</td> <td>-3 dBFS/0 dBFS</td> </tr> </tbody> </table>                                                             |                                                                                                                                                                                     |                   | Status | Peak | Emb 1-2 | Dolby Digital | Data | Emb 3-4 | Present - PCM | -80 dBFS/-80 dBFS | Emb 5-6 | Present - PCM | -80 dBFS/-80 dBFS | Emb 7-8 | Present - PCM | -20 dBFS/-20 dBFS | Emb 9-10 | Present - PCM | 0 dBFS/-20 dBFS | Emb 11-12 | Present - PCM | -14 dBFS/-10 dBFS | Emb 13-14 | Present - PCM | -9 dBFS/-5 dBFS | Emb 15-16 | Present - PCM | -3 dBFS/0 dBFS |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Status                                                                                                                                                                              | Peak              |        |      |         |               |      |         |               |                   |         |               |                   |         |               |                   |          |               |                 |           |               |                   |           |               |                 |           |               |                |
| Emb 1-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Dolby Digital                                                                                                                                                                       | Data              |        |      |         |               |      |         |               |                   |         |               |                   |         |               |                   |          |               |                 |           |               |                   |           |               |                 |           |               |                |
| Emb 3-4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Present - PCM                                                                                                                                                                       | -80 dBFS/-80 dBFS |        |      |         |               |      |         |               |                   |         |               |                   |         |               |                   |          |               |                 |           |               |                   |           |               |                 |           |               |                |
| Emb 5-6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Present - PCM                                                                                                                                                                       | -80 dBFS/-80 dBFS |        |      |         |               |      |         |               |                   |         |               |                   |         |               |                   |          |               |                 |           |               |                   |           |               |                 |           |               |                |
| Emb 7-8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Present - PCM                                                                                                                                                                       | -20 dBFS/-20 dBFS |        |      |         |               |      |         |               |                   |         |               |                   |         |               |                   |          |               |                 |           |               |                   |           |               |                 |           |               |                |
| Emb 9-10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Present - PCM                                                                                                                                                                       | 0 dBFS/-20 dBFS   |        |      |         |               |      |         |               |                   |         |               |                   |         |               |                   |          |               |                 |           |               |                   |           |               |                 |           |               |                |
| Emb 11-12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Present - PCM                                                                                                                                                                       | -14 dBFS/-10 dBFS |        |      |         |               |      |         |               |                   |         |               |                   |         |               |                   |          |               |                 |           |               |                   |           |               |                 |           |               |                |
| Emb 13-14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Present - PCM                                                                                                                                                                       | -9 dBFS/-5 dBFS   |        |      |         |               |      |         |               |                   |         |               |                   |         |               |                   |          |               |                 |           |               |                   |           |               |                 |           |               |                |
| Emb 15-16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Present - PCM                                                                                                                                                                       | -3 dBFS/0 dBFS    |        |      |         |               |      |         |               |                   |         |               |                   |         |               |                   |          |               |                 |           |               |                   |           |               |                 |           |               |                |

# Setup/Operating Instructions BBG-1050-EMDE-ANC Function Menu List and Descriptions

Table 3-1 BBG-1050-EMDE-ANC Function Menu List — continued

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                       |               |                       |                                   |                      |             |                       |             |                   |            |                   |                |                   |                |                   |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|-----------------------|-----------------------------------|----------------------|-------------|-----------------------|-------------|-------------------|------------|-------------------|----------------|-------------------|----------------|-------------------|----------|
| <div style="background-color: #333; color: white; padding: 5px; display: inline-block; border-radius: 5px;">Timecode</div>                                                                                                                                                                                                                                                                                                                                          | <p>Provides timecode data extraction from various sources, and provides formatting and re-insertion controls for inserting the timecode into the output video.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                       |               |                       |                                   |                      |             |                       |             |                   |            |                   |                |                   |                |                   |          |
| <p>Shown below is an example in which received 525i 5994 SDI video with VITC waveform timecode is being processed to output ATC_VITC timecode. 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.</p>                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                       |               |                       |                                   |                      |             |                       |             |                   |            |                   |                |                   |                |                   |          |
| <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>525i 5994 w/ VITC Waveform → <b>BBG-1050</b> → 525i 5994 w/ ATC_VITC</p> </div> <p><b>A</b> 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 (<b>SDI VITC</b>) as a choice. This extracts VITC Waveform timecode data from the incoming video.</p> | <table border="1" style="width: 100%; border-collapse: collapse; background-color: #f0f0f0;"> <tr><td>Reference VITC Status</td><td>05:49:08:20.1</td></tr> <tr><td>Input VITC Status</td><td>05:49:08:19.1</td></tr> <tr><td>Input ATC_LTC Status</td><td>Not Present</td></tr> <tr><td>Input ATC_VITC Status</td><td>Not Present</td></tr> </table><br><table border="1" style="width: 100%; border-collapse: collapse; background-color: #f0f0f0;"> <tr><td>Source Priority 1</td><td>Input VITC</td></tr> <tr><td>Source Priority 2</td><td>Input ATC_VITC</td></tr> <tr><td>Source Priority 3</td><td>Reference VITC</td></tr> <tr><td>Source Priority 4</td><td>Free Run</td></tr> </table> | Reference VITC Status | 05:49:08:20.1 | Input VITC Status     | 05:49:08:19.1                     | Input ATC_LTC Status | Not Present | Input ATC_VITC Status | Not Present | Source Priority 1 | Input VITC | Source Priority 2 | Input ATC_VITC | Source Priority 3 | Reference VITC | Source Priority 4 | Free Run |
| Reference VITC Status                                                                                                                                                                                                                                                                                                                                                                                                                                               | 05:49:08:20.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                       |               |                       |                                   |                      |             |                       |             |                   |            |                   |                |                   |                |                   |          |
| Input VITC Status                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 05:49:08:19.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                       |               |                       |                                   |                      |             |                       |             |                   |            |                   |                |                   |                |                   |          |
| Input ATC_LTC Status                                                                                                                                                                                                                                                                                                                                                                                                                                                | Not Present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                       |               |                       |                                   |                      |             |                       |             |                   |            |                   |                |                   |                |                   |          |
| Input ATC_VITC Status                                                                                                                                                                                                                                                                                                                                                                                                                                               | Not Present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                       |               |                       |                                   |                      |             |                       |             |                   |            |                   |                |                   |                |                   |          |
| Source Priority 1                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Input VITC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                       |               |                       |                                   |                      |             |                       |             |                   |            |                   |                |                   |                |                   |          |
| Source Priority 2                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Input ATC_VITC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                       |               |                       |                                   |                      |             |                       |             |                   |            |                   |                |                   |                |                   |          |
| Source Priority 3                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Reference VITC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                       |               |                       |                                   |                      |             |                       |             |                   |            |                   |                |                   |                |                   |          |
| Source Priority 4                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Free Run                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |               |                       |                                   |                      |             |                       |             |                   |            |                   |                |                   |                |                   |          |
| <p><b>B</b> In this example, it is desired to provide SDI ATC_VITC timecode data in the processed output video. As such, set <b>SD ATC VITC Insertion</b> to <b>Enabled</b>.</p> <p>In the example here, the line numbers are set to the default SMPTE 12M-2-2008 recommended values.</p>                                                                                                                                                                           | <table border="1" style="width: 100%; border-collapse: collapse; background-color: #f0f0f0;"> <tr><td>SD ATC_VITC Insertion</td><td>Enabled</td></tr> <tr><td>SD ATC Insertion Line</td><td>13 - SMPTE 12M-2-2008 Recommended</td></tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                  | SD ATC_VITC Insertion | Enabled       | SD ATC Insertion Line | 13 - SMPTE 12M-2-2008 Recommended |                      |             |                       |             |                   |            |                   |                |                   |                |                   |          |
| SD ATC_VITC Insertion                                                                                                                                                                                                                                                                                                                                                                                                                                               | Enabled                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                       |               |                       |                                   |                      |             |                       |             |                   |            |                   |                |                   |                |                   |          |
| SD ATC Insertion Line                                                                                                                                                                                                                                                                                                                                                                                                                                               | 13 - SMPTE 12M-2-2008 Recommended                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                       |               |                       |                                   |                      |             |                       |             |                   |            |                   |                |                   |                |                   |          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                       |               |                       |                                   |                      |             |                       |             |                   |            |                   |                |                   |                |                   |          |


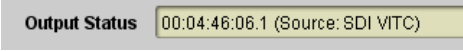
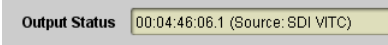


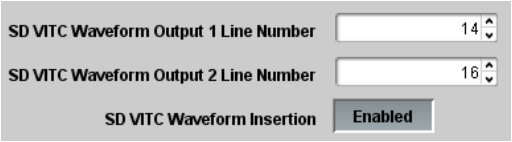

Table 3-1 BBG-1050-EMDE-ANC Function Menu List — continued

|                                                                                                                                                                                                                                                                                             | (continued)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Option</b>  <b>Audio LTC</b> controls described below only appear on devices with <b>+LTC</b> licensed optional feature. This feature 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.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <p>• <b>Timecode Source Status Displays</b></p>                                                                                                                                                                                                                                             | <p>Displays the current status and contents of the four supported external timecode formats shown to the left.</p> <ul style="list-style-type: none"> <li>• If a format is receiving timecode data, the current content (timecode running count and line number) is displayed.</li> <li>• If a format is not receiving timecode data, Not Present is displayed.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <p>• <b>LTC Input Control</b></p>                                                                                                                                                                                                                                                           | <p>Selects source to be used by device to <b>receive</b> LTC as listed below.</p> <ul style="list-style-type: none"> <li>• RS-485 over COM1 or COM 2</li> <li>• Audio LTC over Emb Ch 1 thru Ch 16</li> </ul> <p><b>Note:</b> • <b>Audio LTC Source</b> must be appropriately set to receive and process received LTC.</p> <ul style="list-style-type: none"> <li>• 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. 3-19) for more information.</li> <li>• Device 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.</li> </ul>                                                                                                                                                                                                                                                 |
| <p>• <b>Mute LTC Control</b></p>                                                                                                                                                                                                                                                          | <p>Allows LTC audio or RS-485 output to mute upon loss of selected timecode inputs.</p> <ul style="list-style-type: none"> <li>• When set to <b>Enabled</b> and input timecode is lost:             <ul style="list-style-type: none"> <li>• RS-485 LTC output goes to frozen state.</li> <li>• Audio LTC output mutes.</li> </ul> </li> <li>• When set to <b>Disabled</b> and input timecode is lost:             <ul style="list-style-type: none"> <li>• RS-485 LTC output keeps counting, with count value being free-run count.</li> <li>• Audio LTC output is not muted, with count value being free-run count.</li> </ul> </li> </ul> <p><b>Note:</b> If muting upon loss of a particular input format is desired, set all <b>Source Priority 1</b> thru <b>4</b> 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.</p> |
| <p>• <b>Incoming ATC Packet Removal Control</b></p>                                                                                                                                                                                                                                       | <p>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.)</p> <p><b>Note:</b> Set this control to <b>Enabled</b> if Free-Run timecode is to be used. If incoming packets are not removed, output embedded SMPTE timecode may alternate between free-run and embedded SMPTE timecode values.</p>                                                                                                                                          |

**Table 3-1 BBG-1050-EMDE-ANC Function Menu List — continued**

| <div style="background-color: #333; color: white; padding: 5px; text-align: center; font-weight: bold;">Timecode</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | (continued)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                          |              |              |                          |                  |                  |                          |                  |                 |                          |                 |                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------|--------------|--------------------------|------------------|------------------|--------------------------|------------------|-----------------|--------------------------|-----------------|------------------|
| <p><b>• Source Priority</b></p> <div style="border: 1px solid gray; padding: 5px; margin-bottom: 10px;"> <p>Source Priority 1 <span style="float: right;">Free Run ▼</span></p> <div style="border: 1px solid gray; padding: 2px; margin-top: 2px;"> <p>Free Run</p> <p>Reference VITC</p> <p>Input VITC</p> <p>Input ATC_LTC</p> <p>Input ATC_VITC</p> <p>Disable Output</p> </div> </div> <p style="text-align: center;">⋮</p> <div style="border: 1px solid gray; padding: 5px;"> <p>Source Priority 4 <span style="float: right;">Reference VITC ▼</span></p> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p>Selects the priority assigned to each of the four supported external formats, and internal Free Run in the event the preferred source is unavailable.</p> <p><b>Source Priority 1</b> thru <b>Source Priority 4</b> 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.)</p> <div style="text-align: center; margin: 10px 0;"> </div> <p>In this example, <b>Input VITC</b> 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 device.</p> <p>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 device then uses the reference VITC data received on the frame reference.</p> <p><b>Note:</b> Set Incoming ATC Packet Removal Control to <b>Enabled</b> if Free-Run timecode is to be used. If incoming packets are not removed, output embedded SMPTE timecode may alternate between free-run and embedded SMPTE timecode values.</p> |                          |              |              |                          |                  |                  |                          |                  |                 |                          |                 |                  |
| <p> 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 <b>all</b> timecode output should the ordinate preferred format(s) become unavailable.</p> <p>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.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                          |              |              |                          |                  |                  |                          |                  |                 |                          |                 |                  |
| <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>In this example, even though and ATC_LTC could be available to substitute for ATC_VITC not being present, the device will revert to no timecode output since the choice of Disable Output “out-prioritizes” ATC_LTC with these settings.</p> </div> <div style="width: 50%; border: 1px solid gray; padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"><b>Source Priority 1</b></td> <td style="width: 30%;">Input VITC ▼</td> <td style="width: 30%;">Input VITC ▼</td> </tr> <tr> <td><b>Source Priority 2</b></td> <td>Input ATC_VITC ▼</td> <td>Input ATC_VITC ▼</td> </tr> <tr> <td><b>Source Priority 3</b></td> <td>Disable Output ▼</td> <td>Input ATC_LTC ▼</td> </tr> <tr> <td><b>Source Priority 4</b></td> <td>Input ATC_LTC ▼</td> <td>Disable Output ▼</td> </tr> </table> </div> <div style="width: 45%;"> <p>The choices shown here will allow ATC_LTC to “out-prioritize” Disable Output if ATC_VITC is not available.</p> </div> </div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Source Priority 1</b> | Input VITC ▼ | Input VITC ▼ | <b>Source Priority 2</b> | Input ATC_VITC ▼ | Input ATC_VITC ▼ | <b>Source Priority 3</b> | Disable Output ▼ | Input ATC_LTC ▼ | <b>Source Priority 4</b> | Input ATC_LTC ▼ | Disable Output ▼ |
| <b>Source Priority 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Input VITC ▼                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Input VITC ▼             |              |              |                          |                  |                  |                          |                  |                 |                          |                 |                  |
| <b>Source Priority 2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Input ATC_VITC ▼                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Input ATC_VITC ▼         |              |              |                          |                  |                  |                          |                  |                 |                          |                 |                  |
| <b>Source Priority 3</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Disable Output ▼                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Input ATC_LTC ▼          |              |              |                          |                  |                  |                          |                  |                 |                          |                 |                  |
| <b>Source Priority 4</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Input ATC_LTC ▼                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Disable Output ▼         |              |              |                          |                  |                  |                          |                  |                 |                          |                 |                  |
| <p><b>• Offset Controls</b></p> <div style="border: 1px solid gray; padding: 5px; margin-bottom: 10px;"> <p>Offset <span style="float: right;">Advanced ▼</span></p> <div style="border: 1px solid gray; padding: 2px; margin-top: 2px;"> <p>Delayed</p> <p>Advanced</p> </div> </div> <hr/> <div style="border: 1px solid gray; padding: 5px;"> <p>Offset Field <span style="float: right;">0 ▼</span></p> <p>Offset Frame <span style="float: right;">0</span></p> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>Allows the current timecode count to be advanced or delayed on the output video.</p> <ul style="list-style-type: none"> <li>• <b>Offset Advance</b> or <b>Delay</b> selects offset advance or delay.</li> <li>• <b>Offset Field</b> delays or advances or delays timecode by one field.</li> <li>• <b>Offset Frame</b> delays or advances or delays timecode by up to 5 frames.</li> </ul> <p><b>Note:</b> Default settings are null, with both controls set at zero as shown.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |              |              |                          |                  |                  |                          |                  |                 |                          |                 |                  |

Table 3-1 BBG-1050-EMDE-ANC Function Menu List — continued

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                  | <p><b>(continued)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p>• <b>Output Status Display</b></p>                                                                                                                                                                                                                                                                                                                                                                            | <p>Displays the current content and source being used for the timecode data as follows:</p>  <ul style="list-style-type: none"> <li>• Output status OK (in this example, SDI VITC timecode received and outputted).</li> </ul>  <ul style="list-style-type: none"> <li>• <b>Timecode Insertion</b> button set to <b>Disabled</b>; output insertion disabled.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• If timecode is not available from Source Priority selections performed, timecode on output reverts to Free Run (internal count) mode.</li> <li>• 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:             <ul style="list-style-type: none"> <li>0.0 Frame 0</li> <li>0.1 Frame 1</li> <li>1.0 Frame 2</li> <li>1.1 Frame 3</li> <li>•</li> <li>•</li> <li>•</li> <li>29.1 Frame 59</li> </ul> </li> </ul> |
| <p>• <b>Audio LTC Output</b></p>                                                                                                                                                                                                                                                                                                                                                                               | <p>Audio LTC output is routed to desired embedded audio outputs using the Output Audio Routing/Controls (p. 3-15). Whatever timecode is displayed on the Output Status is converted to audio LTC and available as an LTC audio output.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• The device does not check for conflicts on a given line number. Make certain the selected line is available and carrying no other data.</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p>• <b>SD VITC Waveform Insertion Controls</b></p>                                                                                                                                                                                                                                                                                                                                                            | <p>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.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• If only one output line is to be used, set both controls for the same line number.</li> <li>• <b>SD VITC Waveform Insertion</b> 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.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p>• <b>SD ATC Insertion Control</b></p>                                                                                                                                                                                                                                                                                                                                                                       | <p>For SD output, enables or disables SD ATC_VITC timecode insertion into the output video, and selects the line number for ATC_VITC.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

**Table 3-1 BBG-1050-EMDE-ANC Function Menu List — continued**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div style="background-color: #333; color: white; padding: 5px; text-align: center; font-weight: bold; font-size: 1.2em;">Timecode</div>                                                                                                                                                                                                                                                                                                                                                                                    | <p><b>(continued)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p><b>• HD ATC_LTC Insertion Control</b></p> <div style="border: 1px solid #ccc; padding: 5px; background-color: #f9f9f9;"> <p>HD ATC_LTC Insertion <span style="float: right;">Enabled</span></p> <p>HD ATC_LTC Insertion Line <span style="float: right;">10 - SMPTE 12M-2-2008 Recommended</span></p> </div>                                                                                                                                                                                                             | <p>For HD output, enables or disables ATC_LTC timecode insertion into the output video, and selects the line number for ATC_LTC timecode data.</p>                                                                                                                                                                                                                                                                                                                                                        |
| <p><b>• HD ATC_VITC Insertion Control</b></p> <div style="border: 1px solid #ccc; padding: 5px; background-color: #f9f9f9;"> <p>HD ATC_VITC Insertion <span style="float: right;">Enabled</span></p> <p>HD ATC_VITC Insertion Line Field 1 <span style="float: right;">9 - SMPTE 12M-2-2008 Recommended</span></p> <p>HD ATC_VITC Insertion Line Field 2 <span style="float: right;">8 (571) - SMPTE 12M-2-2008 Recommended</span></p> </div>                                                                               | <p>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.</p>                                                                                                                                                                                                                                                                                                                                                     |
| <p><b>• ATC_VITC Legacy Support Control</b></p> <div style="border: 1px solid #ccc; padding: 5px; background-color: #f9f9f9;"> <p>ATC_VITC Legacy Support <span style="float: right;">Disabled</span></p> </div>                                                                                                                                                                                                                                                                                                            | <p>When enabled, accommodates equipment requiring ATC_VITC packet in both fields as a "field 1" packet (non-toggling).</p> <p><b>Note:</b> 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.</p>                                                                                                                                                                          |
| <p><b>• Free Run Timecode Controls</b></p> <div style="border: 1px solid #ccc; padding: 5px; background-color: #f9f9f9;"> <p>Free Run Hours <span style="float: right;">7</span></p> <p>Free Run Minutes <span style="float: right;">0</span></p> <p>Free Run Seconds <span style="float: right;">0</span></p> <p>Apply Free Run Values <span style="float: right;">Confirm</span></p> </div>                                                                                                                               | <p>Allows an initial (starting) count to be applied to output video timecode when Free Run insertion is enabled.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• Initialization can only be applied when device is outputting Free Run timecode (as shown by Output Status displaying "Free Run").</li> <li>• 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.</li> </ul> |
| <div style="background-color: #333; color: white; padding: 5px; text-align: center; font-weight: bold; font-size: 1.2em;">Output Audio Routing/Controls</div>                                                                                                                                                                                                                                                                                                                                                               | <p>Provides per-channel selectors to allow embedded audio pass-thru, or embed LTC or SMPTE 337 data onto selected channels.</p>                                                                                                                                                                                                                                                                                                                                                                           |
| <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• <b>Embedded Ch 2 thru Embedded Ch 16</b> have controls identical to those shown below. Therefore, only the <b>Embedded Ch 1</b> controls are shown here.</li> <li>• For each channel, its source and destination should be considered and appropriately set.</li> </ul>                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p><b>• Embedded Output Channel Source</b></p> <div style="border: 1px solid #ccc; padding: 5px; background-color: #f9f9f9;"> <div style="background-color: #333; color: white; padding: 2px; text-align: center; font-weight: bold; font-size: 0.8em;">Emb Out Ch 1</div> <div style="border: 1px solid #ccc; padding: 2px; background-color: #fff;"> <p>Audio Bus Ch 1</p> <p>Audio Bus Ch 1</p> <p>•</p> <p>•</p> <p>•</p> <p>Audio Bus Ch 16</p> <p>LTC</p> <p>Embedded Data L</p> <p>Embedded Data R</p> </div> </div> | <p>Using the drop-down list, selects the audio input source to be embedded in the corresponding embedded output channel from the following choices:</p> <ul style="list-style-type: none"> <li>• <b>Audio Bus Ch 1 thru Ch 16</b> (channel pass-thru)</li> <li>• <b>Option</b> <b>Audio LTC</b></li> <li>• <b>Embedded Data L and R</b> (SMPTE 337 non-PCM data embedding)</li> </ul>                                                                                                                     |

Table 3-1 BBG-1050-EMDE-ANC Function Menu List — continued

Ancillary Data Processing

ADP Routing
IP Port Setup

Provides controls for VANC/HANC ancillary data de-embedding and embedding to and from program video stream. Data can be extracted and inserted within the device (Bridge mode), or inserted and/or extracted to and from external interfaces via serial or IP interfaces.

Eight individual Ancillary Data Processors (ADPs) provide for insertion, extraction, or bridging ancillary data to and from the program video SDI stream.

**Mode** controls select the type of ANC processing:

- **Bridge** extracts ANC from the deserialized input video and re-inserts in the output video, thereby allowing specialized ANC packets to be retained and passed on the processed output (for example, preserving special payloads such as STCE 104 for a format-converted output)
- **Insert** and **Extract** modes respectively allow insertion to the output stream or extraction from the input stream between external interfaces

**Interface** controls select either device IP or serial data (COM 1) interface where Mode is set to insertion or extraction  
**Note:** COM1 is available for ADP Proc 1 only; all other ADPs use IP only for external import/export insertion/extraction.

**Insertion** controls allow special insertions in HANC or the C-channel, as well as removal of incoming packets

**DID and SDID** controls select the desired packet to be handled by the corresponding ANC Data Processor

**Line Number** controls select the VANC location of packet insertion/extraction. Setting the line numbers to 0 (zero) lets externally-sourced payload assert and set the line number.

In the example above, **ADP Proc 1** is set to extract ATC timecode at DID60<sub>h</sub> / SDID 60<sub>h</sub>. Depending on the interface used to carry the extraction (COM or IP), status is displayed as shown below.

Extracting 15.0 Kbit/s, dropped 0.0 Kbit

When set to extract to **COM** interface, displays rate and dropped data (if any)

---

Extracting 18.75 Kbit/s, total 125.78 Kbit

When set to extract to **IP** interface, displays rate and total amount transferred

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



**Table 3-1 BBG-1050-EMDE-ANC Function Menu List — continued**


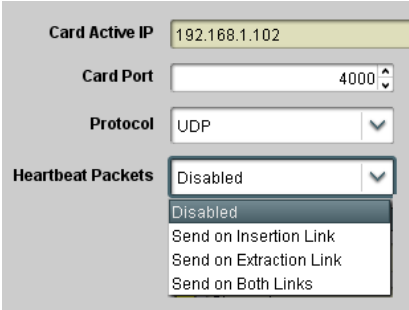
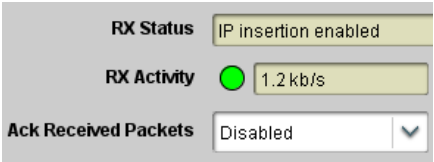
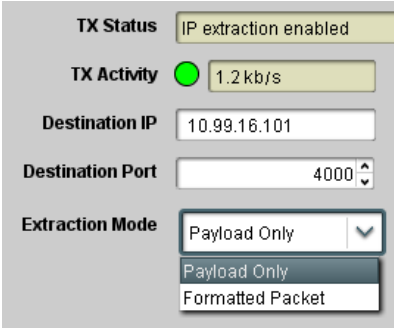
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p><b>IP Port Setup</b> sub-tab provides IP setup.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                  |                                                       |                   |                          |                   |  |       |       |       |       |       |       |     |                          |     |                          |     |                          |     |             |     |                      |      |          |   |     |   |              |   |      |   |               |     |                                                                              |     |                                                       |       |              |       |                       |       |                |       |                         |      |         |       |          |
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| <p>• <b>IP Setup</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>Provides setup controls for IP insert/extract communications as follows:</p> <ul style="list-style-type: none"> <li>• <b>Active IP:</b> Shows the device IP address. (IP address is set using <b>Admin</b> tab Networking settings).</li> <li>• <b>Card Port:</b> Sets device IP Rx/Tx port.</li> <li>• <b>Protocol:</b> Sets device to match protocol used (UDP or TCP).</li> <li>• <b>Heartbeat Packets:</b> Disables or provides heartbeat packets as shown.</li> </ul>                                                                                                                                            |                                                  |                                                       |                   |                          |                   |  |       |       |       |       |       |       |     |                          |     |                          |     |                          |     |             |     |                      |      |          |   |     |   |              |   |      |   |               |     |                                                                              |     |                                                       |       |              |       |                       |       |                |       |                         |      |         |       |          |
| <p>• <b>IP Insertion (Receive) Setup/Status</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <p>Shows receiving IP address/status follows:</p> <ul style="list-style-type: none"> <li>• <b>Rx Status:</b> Shows if device is set for (and receiving) IP data.</li> <li>• <b>Rx Activity:</b> Shows data rate when data is being received. <ul style="list-style-type: none"> <li>- Stopped (with yellow indicator) means no data is being received.</li> <li>- Green indicator means data is being received and inserted. Data rate is also shown.</li> </ul> </li> <li>• <b>Ack Received Packets:</b> Disables or enables ACK upon receiving packets. Allows Shows device IP receive/Rx insertion status.</li> </ul> |                                                  |                                                       |                   |                          |                   |  |       |       |       |       |       |       |     |                          |     |                          |     |                          |     |             |     |                      |      |          |   |     |   |              |   |      |   |               |     |                                                                              |     |                                                       |       |              |       |                       |       |                |       |                         |      |         |       |          |
| <p>• <b>IP Transmit Setup/Status</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p>Shows transmitting IP address/status follows:</p> <ul style="list-style-type: none"> <li>• <b>Extraction / Tx Status:</b> Shows device extraction from stream to Tx status. <ul style="list-style-type: none"> <li>- Stopped (with yellow indicator) means no data is being sent.</li> <li>- Green indicator means data is being extracted and sent. Data rate is also shown.</li> </ul> </li> <li>• <b>Destination IP/Port:</b> Allows setting destination IP address and port.</li> <li>• <b>Extraction Mode:</b> Sets the IP data sent to consist of only payload, or send as formatted packets.</li> </ul>        |                                                  |                                                       |                   |                          |                   |  |       |       |       |       |       |       |     |                          |     |                          |     |                          |     |             |     |                      |      |          |   |     |   |              |   |      |   |               |     |                                                                              |     |                                                       |       |              |       |                       |       |                |       |                         |      |         |       |          |
| <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Packets received must be sized to fit in a native ancillary data packet (i.e., payloads that span multiple ancillary packets need to be broken down by the sending controller before they are sent to the device).</li> <li>• Device can be configured to send back ACK packets each time data is inserted. The ACK packet is sent immediately after the data is actually inserted. Packets need to be broken down by the sending controller before they are sent to the device. Device can also be configured to send out "heartbeat" packets every two seconds as an additional safeguard.</li> <li>• Packet formatting for insertion/extraction, ACK, and heartbeat is as follows:</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                  |                                                       |                   |                          |                   |  |       |       |       |       |       |       |     |                          |     |                          |     |                          |     |             |     |                      |      |          |   |     |   |              |   |      |   |               |     |                                                                              |     |                                                       |       |              |       |                       |       |                |       |                         |      |         |       |          |
| <table border="1"> <thead> <tr> <th colspan="2">Packet formatting used for insertion/extraction:</th> <th colspan="2">ACK Packet Format</th> <th colspan="2">Heartbeat Packets</th> </tr> <tr> <th>Bytes</th> <th>Field</th> <th>Bytes</th> <th>Field</th> <th>Bytes</th> <th>Field</th> </tr> </thead> <tbody> <tr> <td>3:0</td> <td>Packet Type (0xF5AB02ED)</td> <td>3:0</td> <td>Packet Type (0xAC73B938)</td> <td>3:0</td> <td>Packet Type (0x20120831)</td> </tr> <tr> <td>5:4</td> <td>Packet size</td> <td>5:4</td> <td>Received packet size</td> <td rowspan="8">31:4</td> <td rowspan="8">Reserved</td> </tr> <tr> <td>6</td> <td>DID</td> <td>6</td> <td>Received DID</td> </tr> <tr> <td>7</td> <td>SDID</td> <td>7</td> <td>Received SDID</td> </tr> <tr> <td>9:8</td> <td>Line number for Insertion. If set to 0, use the line number set by software.</td> <td>9:8</td> <td>Line number on which the received packet was inserted</td> </tr> <tr> <td>11:10</td> <td>Payload size</td> <td>11:10</td> <td>Received payload size</td> </tr> <tr> <td>15:12</td> <td>User packet ID</td> <td>15:12</td> <td>Received user packet ID</td> </tr> <tr> <td>N:16</td> <td>Payload</td> <td>31:16</td> <td>Reserved</td> </tr> </tbody> </table> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Packet formatting used for insertion/extraction: |                                                       | ACK Packet Format |                          | Heartbeat Packets |  | Bytes | Field | Bytes | Field | Bytes | Field | 3:0 | Packet Type (0xF5AB02ED) | 3:0 | Packet Type (0xAC73B938) | 3:0 | Packet Type (0x20120831) | 5:4 | Packet size | 5:4 | Received packet size | 31:4 | Reserved | 6 | DID | 6 | Received DID | 7 | SDID | 7 | Received SDID | 9:8 | Line number for Insertion. If set to 0, use the line number set by software. | 9:8 | Line number on which the received packet was inserted | 11:10 | Payload size | 11:10 | Received payload size | 15:12 | User packet ID | 15:12 | Received user packet ID | N:16 | Payload | 31:16 | Reserved |
| Packet formatting used for insertion/extraction:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ACK Packet Format                                |                                                       | Heartbeat Packets |                          |                   |  |       |       |       |       |       |       |     |                          |     |                          |     |                          |     |             |     |                      |      |          |   |     |   |              |   |      |   |               |     |                                                                              |     |                                                       |       |              |       |                       |       |                |       |                         |      |         |       |          |
| Bytes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Field                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Bytes                                            | Field                                                 | Bytes             | Field                    |                   |  |       |       |       |       |       |       |     |                          |     |                          |     |                          |     |             |     |                      |      |          |   |     |   |              |   |      |   |               |     |                                                                              |     |                                                       |       |              |       |                       |       |                |       |                         |      |         |       |          |
| 3:0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Packet Type (0xF5AB02ED)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3:0                                              | Packet Type (0xAC73B938)                              | 3:0               | Packet Type (0x20120831) |                   |  |       |       |       |       |       |       |     |                          |     |                          |     |                          |     |             |     |                      |      |          |   |     |   |              |   |      |   |               |     |                                                                              |     |                                                       |       |              |       |                       |       |                |       |                         |      |         |       |          |
| 5:4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Packet size                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 5:4                                              | Received packet size                                  | 31:4              | Reserved                 |                   |  |       |       |       |       |       |       |     |                          |     |                          |     |                          |     |             |     |                      |      |          |   |     |   |              |   |      |   |               |     |                                                                              |     |                                                       |       |              |       |                       |       |                |       |                         |      |         |       |          |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | DID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 6                                                | Received DID                                          |                   |                          |                   |  |       |       |       |       |       |       |     |                          |     |                          |     |                          |     |             |     |                      |      |          |   |     |   |              |   |      |   |               |     |                                                                              |     |                                                       |       |              |       |                       |       |                |       |                         |      |         |       |          |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | SDID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 7                                                | Received SDID                                         |                   |                          |                   |  |       |       |       |       |       |       |     |                          |     |                          |     |                          |     |             |     |                      |      |          |   |     |   |              |   |      |   |               |     |                                                                              |     |                                                       |       |              |       |                       |       |                |       |                         |      |         |       |          |
| 9:8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Line number for Insertion. If set to 0, use the line number set by software.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 9:8                                              | Line number on which the received packet was inserted |                   |                          |                   |  |       |       |       |       |       |       |     |                          |     |                          |     |                          |     |             |     |                      |      |          |   |     |   |              |   |      |   |               |     |                                                                              |     |                                                       |       |              |       |                       |       |                |       |                         |      |         |       |          |
| 11:10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Payload size                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 11:10                                            | Received payload size                                 |                   |                          |                   |  |       |       |       |       |       |       |     |                          |     |                          |     |                          |     |             |     |                      |      |          |   |     |   |              |   |      |   |               |     |                                                                              |     |                                                       |       |              |       |                       |       |                |       |                         |      |         |       |          |
| 15:12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | User packet ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 15:12                                            | Received user packet ID                               |                   |                          |                   |  |       |       |       |       |       |       |     |                          |     |                          |     |                          |     |             |     |                      |      |          |   |     |   |              |   |      |   |               |     |                                                                              |     |                                                       |       |              |       |                       |       |                |       |                         |      |         |       |          |
| N:16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Payload                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 31:16                                            | Reserved                                              |                   |                          |                   |  |       |       |       |       |       |       |     |                          |     |                          |     |                          |     |             |     |                      |      |          |   |     |   |              |   |      |   |               |     |                                                                              |     |                                                       |       |              |       |                       |       |                |       |                         |      |         |       |          |

Table 3-1 BBG-1050-EMDE-ANC Function Menu List — continued

Ancillary Data Processing

**Data-Over-Audio** sub-tab provides controls that allow SMPTE 337/338/339 non-PCM data to be embedded and de-embedded on embedded audio pairs, offering a very convenient self-contained transport within the program stream physical media.

Port Setup

Data-Over-Audio Setup

Shown below is an example setup where serial data is embedded as SMPTE 337 non-PCM data on a sending embedded pair, and then extracted on a receiving pair and converted back to serial data using two cards/devices with the **+ANC** option.

**A** The **COM Routing** tab and appropriate sub-tab is set to receive serial data, noting bit rate and parity settings to conform to the received serial data. (See COMM Ports Setup Controls (p. 3-19))

**B** The received serial data is then directed to an embedded audio output channel pair by setting a pair to Embedded Data using the **Output Audio Routing/Controls** tab (in this example, Emb pair 7/8).

| Emb Out Ch 7    | Emb Out Ch 8    |
|-----------------|-----------------|
| Embedded Data L | Embedded Data R |
| Mute            | Mute            |

**C** The embedded data pair on the receiving end is then selected using the De-Embed Source select drop-down on the **Data-Over-Audio Setup** sub-tab (in this example, Emb Pair 4 (channels 7/8) as correspondingly set on the sending card).

|                 |                  |
|-----------------|------------------|
| De-Embed Source | Emb Audio Pair 4 |
|                 | Emb Audio Pair 1 |
|                 | Emb Audio Pair 2 |
|                 | Emb Audio Pair 3 |
|                 | Emb Audio Pair 4 |
|                 | Emb Audio Pair 5 |
|                 | Emb Audio Pair 6 |

**D** On the **COM Routing** tab, select Audio Data Extractor to extract and route the received SMPTE 337 data to the desired COM port, noting bit rate, protocol, and parity settings. (See COMM Ports Setup Controls (p. 3-19))

|            |                      |
|------------|----------------------|
| COM Mode   | RS485                |
| TX Routing | Audio Data Extractor |

|               |              |
|---------------|--------------|
| De-Embed Rate | 1.2 KBit/s   |
| Embed Rate    | 0.000 KBit/s |

When data is successfully being de-embedded, the status display shows green and indicates the bit rate (bit rate is bit rate configured on sending end; typically SMPTE 337 data transfer is much faster than serial)

**Notes:**

- Embedded channel pair selected must be a standard boundary pair (e.g., 1/2, 3/4 and so on).
- SMPTE 337/338/339 embedded pair carrying non-PCM data here is marked as "Non-PCM Data Unknown". Any intermediate devices between the Cobalt sending card/device and the Cobalt receiving card/device will transfer this data intact, as long as these devices can transfer in a bit-accurate manner. Most devices capable of carrying Dolby® streams are capable of this. However, any intermediate devices must have functions such as PCM level controls and SRC disabled.

**Table 3-1 BBG-1050-EMDE-ANC Function Menu List — continued**

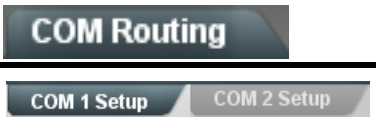
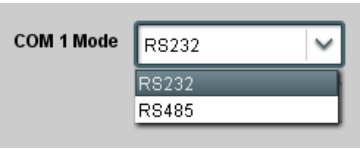
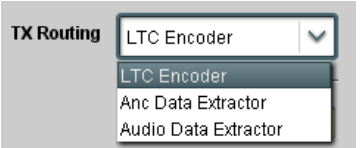

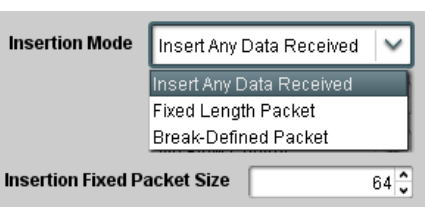
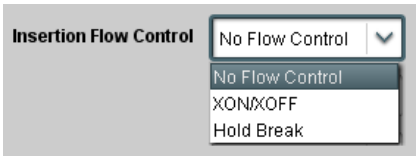

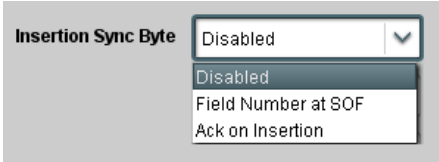
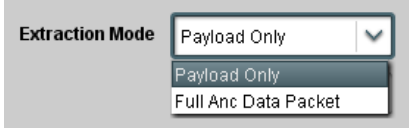
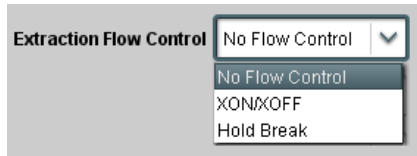

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <p>Provides controls for setting up the two COMM (serial) ports for LTC or ANC functions, and setting comm protocol for each port.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• <b>COM 1</b> and <b>COM 2</b> sub-tabs provide independent controls for COM1 and COM2. Therefore, only the <b>COM 1</b> controls are described here.</li> <li>• Controls provided here allow highly detailed setup of serial communications. Control settings must be carefully considered and set appropriately to correspond to both sending and receiving systems. Incorrectly set controls may result in loss of ANC serial comm.</li> <li>• <b>COM 1</b> and <b>COM 2</b> are multi-function interfaces and must be set for ANC Data Extractor for port(s) is to be used here. Set the port function as described here.</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p>• <b>COM Mode (Protocol)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>Selects serial comm protocol for the respective port as RS-232 or RS-485.</p> <p><b>Note:</b> Protocol choices should consider the payload to be carried. Typically, LTC is sent or received using only RS-485 serial protocol.</p>                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p>• <b>COM Port Tx Routing Function</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p>Selects port function for the respective port as LTC Encoder input or output, or ANC Data Extractor / Audio (SMPTE 337) non-PCM input or output.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <p>• <b>Rx/Tx Status Display</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p>Shows either no data received/sent, or where transfer is present shows data rate (in kbit/sec).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p>• <b>Insertion Mode Control</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <p>Where data is being inserted (received), sets the insertion as follows:</p> <ul style="list-style-type: none"> <li>• <b>Insert Any Data Received:</b> Insert all received data with no regard for packet size.</li> <li>• <b>Fixed Length Packet:</b> Sets receive to wait and accumulate <i>n</i>-number of packet bytes (as set using <b>Insertion Fixed Packet Size</b> control) before inserting data.</li> <li>• <b>Break-Defined Packet:</b> Device receiver looks for character-defined break from source being received to define breaks.</li> </ul>                                                                              |
| <p>• <b>Insertion Flow Control</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <p>Allows communication between device receive and sending source to regulate data receive as follows:</p> <ul style="list-style-type: none"> <li>• <b>No Flow Control:</b> Data is received without buffering or checking to see if data is being received faster than it can be inserted.</li> <li>• <b>XON / XOFF:</b> The device UART Tx will tell the sending source whether it can or cannot accept data at current bit rate.</li> <li>• <b>Hold Break:</b> Card, if close to not being able to accept new data, tells the sending source to hold, and releases this hold when the device is again able to accept new data.</li> </ul> |

Table 3-1 BBG-1050-EMDE-ANC Function Menu List — continued

|                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                 | <p>(continued)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <p>• <b>Insertion Sync Byte Control</b></p>     | <p>Allows use of a sync byte from device receiver back to sending source to synchronize communication between device receive and sending source as follows:</p> <ul style="list-style-type: none"> <li>• <b>Disabled:</b> No special synchronization.</li> <li>• <b>Field Number at SOF:</b> The device sends a single byte telling sending source when start of field 1 or field 2 is occurring.</li> <li>• <b>Ack on Insertion:</b> Device sends a single byte back to sending source when data has been inserted.</li> </ul>                                                                                                                                                                                                                                                                     |
| <p>• <b>Extraction Mode Control</b></p>         | <p>Where data is being extracted from input video, sets the data to be sent as follows:</p> <ul style="list-style-type: none"> <li>• <b>Payload Only:</b> Sends payload only (for example, for closed captioning this would be only the ASCII character string representing the CC content).</li> <li>• <b>Full Anc Data Packet:</b> Sends the entire packet, including payload, DID, SDID, and any handling or marking characters.</li> </ul>                                                                                                                                                                                                                                                                                                                                                      |
| <p>• <b>Extraction Flow Control</b></p>        | <p>Allows communication between device transmit and receiving destinations to regulate data receive as follows:</p> <ul style="list-style-type: none"> <li>• <b>No Flow Control:</b> Data is transmitted without buffering or checking to see if data is being transmitted faster than it can be received.</li> <li>• <b>XON / XOFF:</b> The device UART Rx will acknowledge from the receiving system whether it can or cannot accept data at current bit rate.</li> <li>• <b>Hold Break:</b> Device, if receiving notification from the receiving system that it is close to not being able to accept new data, tells the device to hold. Device releases this hold when the receiving system removes the break command, indicating destination is now ready again to accept new data.</li> </ul> |
| <p>• <b>Bit Rate/ Parity Gen Control</b></p>  | <p>For both Rx and Tx, sets UART for bit rate and parity as follows:</p> <ul style="list-style-type: none"> <li>• <b>Bit Rate:</b> Sets Tx/Rx bit rate from 1 of 5 speeds ranging from 9600 to 230400 Baud.</li> <li>• <b>Parity:</b> Sets device Rx to expect odd or even parity from incoming data, and sets device Tx to generate a parity bit to satisfy selected parity. Where parity is set, incoming data not conforming to parity selection is rejected.</li> </ul>                                                                                                                                                                                                                                                                                                                         |

**Table 3-1 BBG-1050-EMDE-ANC Function Menu List — continued**

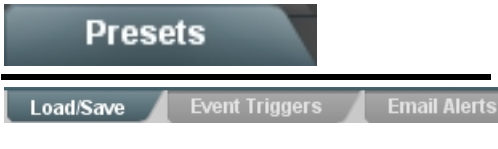
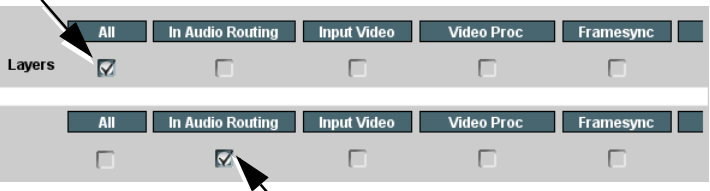

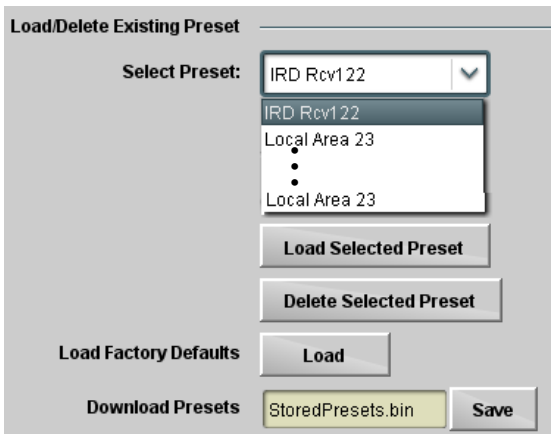
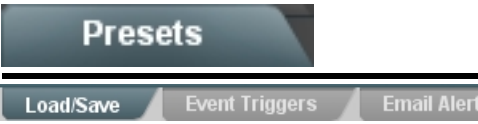

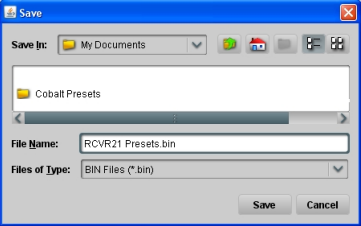

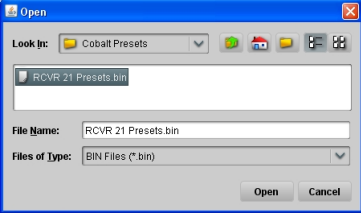
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>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.</p> <p>Also provides event-based loading allowing a defined preset to be automatically engaged upon various received signal status. Also provides automated Email alerts when an event has occurred.</p>                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p><b>• Preset Layer Select</b></p> <p>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.</p> <p>Default <b>All</b> setting will “look” at all card settings and save all settings to the defined preset with no masking.</p>  <p>Selecting a layer (in the example, “In Audio Routing”) will set the preset to <b>only</b> “look at” and “touch” audio routing settings and save these settings under the preset. When the preset is loaded (recalled), the card will only “touch” the audio routing layer.</p> <p><b>Example:</b> Since EAS audio routing can be considered independent of video proc settings, if normal audio routing was set up with a particular video proc setting in effect, and at a later time EAS audio routing is desired to be saved and invoked as a preset, selecting <b>In Audio Routing</b> here tells the preset save and load to not concern itself with video proc settings. In this manner, any video proc settings in effect when the EAS preset is invoked will not affect any video proc settings that might be currently in effect.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p><b>• Preset Enter/Save/Delete</b></p>  <p><b>Protected state</b> – changes locked out</p> <p><b>Ready (open) state</b> – changes can be applied</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p>Locks and unlocks editing of presets to prevent accidental overwrite as follows:</p> <ul style="list-style-type: none"> <li>• <b>Protect (ready):</b> This state awaits Protected and allows preset Save/Delete button to save or delete current settings to the selected preset. <b>Use this setting when writing or editing a preset.</b></li> <li>• <b>Protected:</b> Toggle to this setting to lock down all presets from being inadvertently re-saved or deleted. <b>Use this setting when all presets are as intended.</b></li> <li>• <b>Create New Preset:</b> Field for entering user-defined name for the preset being saved (in this example, “IRD Rcv122”).</li> <li>• <b>Save:</b> Saves the current settings under the preset name defined above.</li> </ul> |
| <p><b>• Preset Save/Load Controls</b></p>  <ul style="list-style-type: none"> <li>• <b>Select Preset:</b> drop-down allows a preset saved above to be selected to be loaded or deleted (in this example, custom preset “IRD Rcv122”).</li> <li>• <b>Load Selected Preset</b> button allows loading (recalling) the selected preset. When this button is pressed, the changes called out in the preset are immediately applied.</li> <li>• <b>Delete Selected Preset</b> button deletes the currently selected preset.</li> <li>• <b>Load Factory Defaults</b> button allows loading (recalling) the factory default preset. When this button is pressed, the changes called out in the preset are immediately applied.</li> </ul> <p><b>Note:</b> Load Factory Defaults functions with no masking. The Preset Layer Select controls have no effect on this control and will reset <b>all</b> layers to factory default.</p> <ul style="list-style-type: none"> <li>• <b>Download Presets</b> saving the preset files to a folder on the connected computer.</li> </ul>                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

Table 3-1 BBG-1050-EMDE-ANC Function Menu List — continued

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>(continued)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p><b>Download (save)</b> presets to a network computer by clicking <b>Download Presets – Save</b> at the bottom of the Presets page.</p>  <p>Browse to a desired save location (in this example, <i>My Documents\Cobalt Presets</i>).</p> <p>The file can then be renamed if desired (<i>RCVR21 Presets</i> in this example) before committing the save.</p>  | <p><b>Upload (open)</b> presets from a network computer by clicking <b>Upload</b> at the bottom of Dashboard.</p>  <p>Browse to the location where the file was saved on the computer or drive (in this example, <i>My Documents\Cobalt Presets</i>).</p> <p>Select the desired file and click <b>Open</b> to load the file to the device.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• Preset transfer between download and file upload is on a <b>group</b> basis (i.e., individual presets cannot be downloaded or uploaded separately).</li> <li>• 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.</li> </ul>  |

**Table 3-1 BBG-1050-EMDE-ANC Function Menu List — continued**

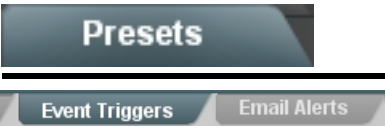

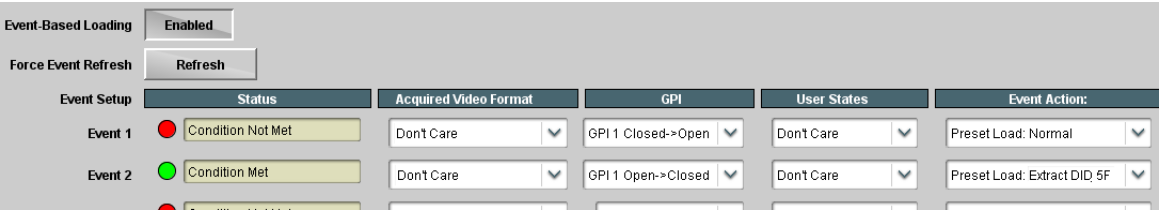
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p>Provides event-based loading allowing a defined preset to be automatically engaged upon various received signal status. Actions can be “canned” control commands or user-defined by going to a user preset.</p> <p>Event-based loading is particularly useful for automated setup when transitioning from normal processing to processing supporting an alternate format.</p> |
| <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;">  </div> <div> <ul style="list-style-type: none"> <li>• 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 <b>Event Based Loading</b> button is set to <b>Disabled</b>.</li> <li>• Because event based preset loading applies 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).</li> </ul> <p>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.</p> <p>The <b>Event based loading</b> button serves as a master enable/disable for the function.</p> <p>Go-to Event Actions 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. 3-25) for setting up e-mail alerts).</p> </div> </div> |                                                                                                                                                                                                                                                                                                                                                                                  |
| <p>In the example here for Event 1 and Event 2, the device is set to invoke a preset that applies DID extraction settings nested in preset “Extract DID 5F” whenever GPI 1 goes LO. When this GPI goes HI, corresponding action in preset “Normal” invokes another preset to revert the device to default settings.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                  |
| <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• Time required to engage an event-based trigger depends upon complexity of the called preset. (For example, a preset that invokes large-scale changes may take longer to engage than a preset involving only a small change.)</li> <li>• Make certain all definable event conditions that the device might be expected to “see” are defined in any of the Event 1 thru Event 32 rows. This makes certain that the device will always have a defined “go-to” action if a particular event occurs. For example, if the device 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.</li> </ul>                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                  |

Table 3-1 BBG-1050-EMDE-ANC Function Menu List — continued

Presets

(continued)

Event Triggers

Email Alerts

**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 successively 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 device. 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              | GPI 1 (key) cue falling-edge sets user state 1                                                                                                                                                     |
| Event 2     | Condition Met     | GPI 2 Open->Closed | User State 1 Set     | Set User State 2              | GPI 2 (audio) cue falling-edge sets user state 2                                                                                                                                                   |
| Event 3     | Condition Met     | Don't Care         | User State 2 Set     | Set User State 3              | 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                                                  |
| 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 | 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. |
| 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            |                                                                                                                                                                                                    |



**Table 3-1 BBG-1050-EMDE-ANC Function Menu List — continued**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| <div style="border: 1px solid black; padding: 5px;"> <div style="background-color: #444; color: white; padding: 5px; text-align: center; font-weight: bold; font-size: 1.2em;">Presets</div> <hr style="border: 1px solid black;"/> <div style="display: flex; justify-content: space-around; background-color: #eee; padding: 2px;"> <span>Event Triggers</span> <span style="border: 1px solid black; padding: 2px;">Email Alerts</span> </div> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p>Provides setup for automated Email alerts when an event has occurred.</p> |
| <p>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.</p> <p><b>Note:</b> Frame hosting the device must be accessible to email recipient's network. It is recommended to set up and generate a test event to test the email send.</p> <div style="display: flex; align-items: flex-start; margin-top: 20px;"> <div style="border: 1px solid #ccc; background-color: #f9f9f9; padding: 10px; width: 40%;"> <p><b>Last Event:</b> <input type="text" value="Frozen video detected"/></p> <p><b>To:</b> <input type="text" value="joe.doe@xyzmedia.com"/></p> <p><b>From:</b> <input type="text" value="9902slot8frame1A21@xyzmedia.com"/></p> <p><b>SMTP User:</b> <input type="text" value="frame1A21"/></p> <p><b>SMTP Password:</b> <input type="password" value="●●●●●●"/></p> <p><b>SMTP Server:</b> <input type="text" value="smtp.gmail.com"/></p> <p><b>SMTP Port:</b> <input type="text" value="25"/> ▼</p> </div> <div style="margin-left: 20px; width: 55%;"> <p>When fields are filled-in to specify recipient and sender, and email alert is selected for Event Action on Event Triggers sub-tab page, recipient receives an email alert upon event, with the triggering event shown (in this example, "frozen video detected").</p> </div> </div> |                                                                              |

Table 3-1 BBG-1050-EMDE-ANC Function Menu List — continued


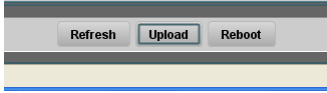
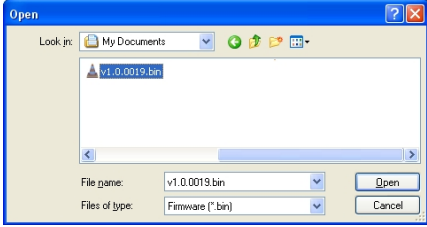
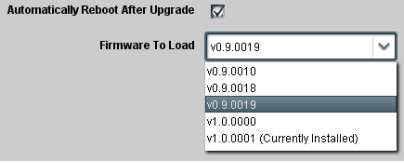
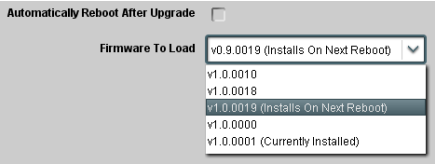
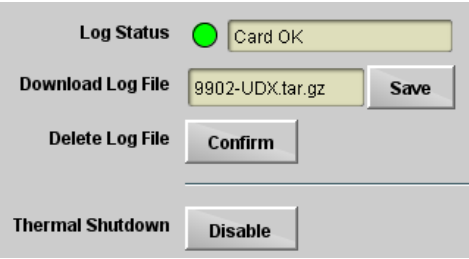
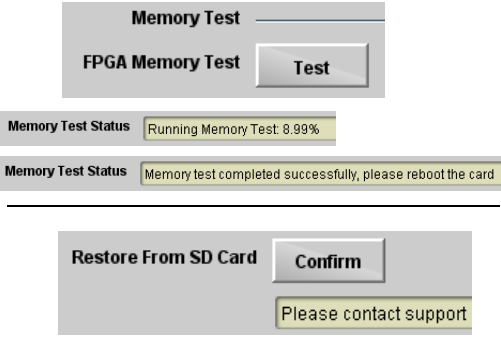


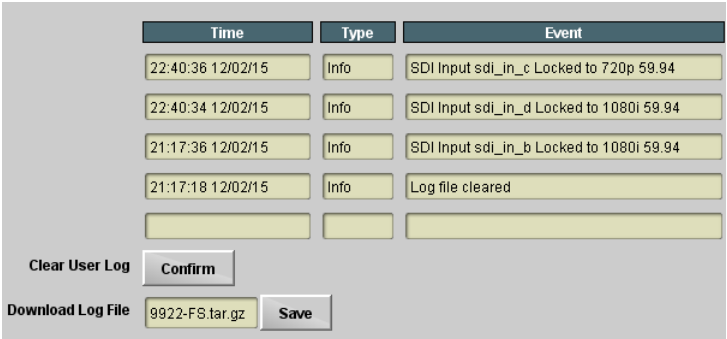
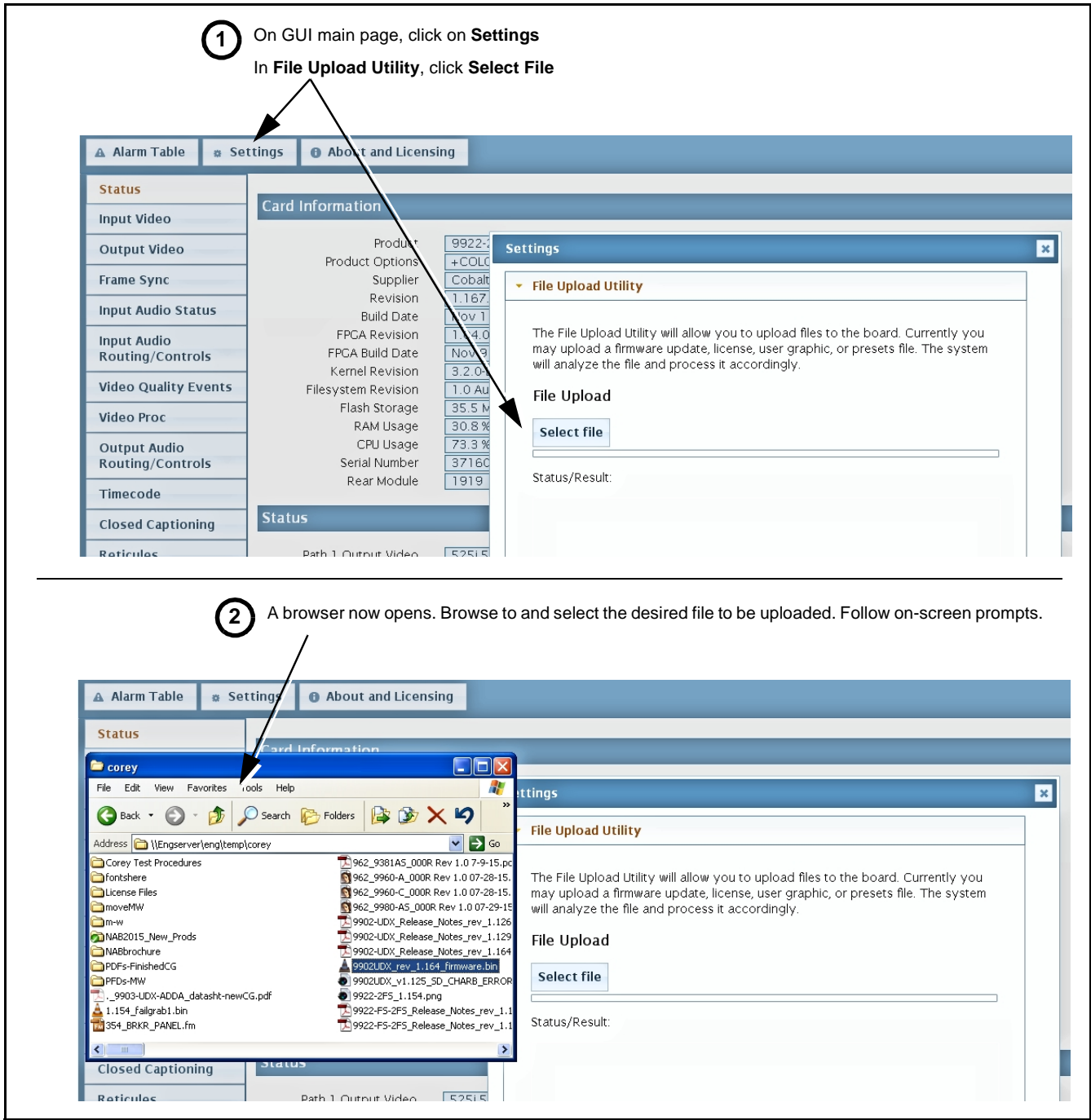
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>Provides a global operating status and allows a log download for factory engineering support. Also provides controls for selecting and loading firmware upgrade files, and for setting the comm IP address.</p>                                                                                                                              |
| <ul style="list-style-type: none"> <li>• <b>Firmware Upgrade Controls</b></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>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).</p> |
| <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• The web interface allows for much faster file uploads than using the DashBoard interface described below. See <i>Uploading Firmware Using Web Interface and GUI</i> (p. 3-28) for details and instructions.</li> <li>• 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 <b>Support&gt;Firmware Downloads</b> link at <a href="http://www.cobaltdigital.com">www.cobaltdigital.com</a>.</li> </ul>                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                 |
| <ol style="list-style-type: none"> <li>1. Access a firmware upgrade file from a network computer by clicking <b>Upload</b> at the bottom of DashBoard.</li> <li>2. Browse to the location of the firmware upgrade file (in this example, <i>My Documents\1.0.0019.bin</i>).</li> <li>3. Select the desired file and click <b>Open</b> to upload the file to the device.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>• <b>Immediate firmware upload.</b> The device default setting of <b>Automatically Reboot After Upgrade</b> checked allow a selected firmware version to be immediately uploaded as follows:             <ol style="list-style-type: none"> <li>1. Click <b>Firmware To Load</b> and select the desired upgrade file to be loaded (in this example, "v1.0.0019").</li> <li>2. Click <b>Load Selected Firmware</b>. The device now reboots and the selected firmware is loaded.</li> </ol> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>• <b>Deferred firmware upload.</b> With <b>Automatically Reboot After Upgrade</b> unchecked, firmware upgrade loading is held off until the device 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).             <ol style="list-style-type: none"> <li>1. Click <b>Firmware To Load</b> 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".</li> <li>2. Click <b>Load Selected Firmware</b>. The device holds directions to proceed with the upload, and performs the upload only when the device is manually rebooted (by pressing the <b>Reboot</b> button).</li> <li>3. To cancel a deferred upload, press <b>Cancel Pending Upgrade</b>. The device reverts to the default settings that allow an immediate upload/upgrade.</li> </ol> </li> </ul> |                                                                                                                                                                                                                                                             |

Table 3-1 BBG-1050-EMDE-ANC Function Menu List — continued

|                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div style="text-align: center; background-color: #333; color: white; padding: 5px; border-radius: 5px;">Admin</div>                                                                                                                                               | <p>(continued)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <p>• <b>Log Status and Download Controls</b></p>                                                                                                                                  | <ul style="list-style-type: none"> <li>• <b>Log Status</b> indicates overall internal operating status.</li> <li>• <b>Download Log File</b> allows a operational log file to be saved to a host computer. This log file can be useful in case of an error or in the case of an operational error or condition. The file can be submitted to Cobalt engineering for further analysis.</li> <li>• <b>Delete Log File</b> deletes the currently displayed log file. A second confirmation dialog is displayed to back out of the delete if desired.</li> <li>• <b>Thermal Shutdown</b> enable/disable allows the built-in thermal failover to be defeated. (Thermal shutdown is enabled by default).</li> </ul> <div style="background-color: #333; color: white; padding: 5px; text-align: center; font-weight: bold; margin-top: 10px;">CAUTION</div> <p>The BBG-1050-EMDE-ANC 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.</p> |
| <p>• <b>Card Check and Restore Utilities</b></p>                                                                                                                                 | <p><b>Memory Test</b> allows all cells of the device FPGA memory to be tested.</p>  <p>This control should <b>only</b> be activated under direction of product support. Exercising the memory test is <b>not</b> part of normal device maintenance.</p> <p><b>Restore from SD Card</b> allows device rendered inoperable to be restored using an SD memory card fitted to the device internal SD slot.</p>  <p>Product support must be contacted prior to performing this operation. Use of any SD card not supplied by support can corrupt the device.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <div style="text-align: center; background-color: #333; color: white; padding: 5px; border-radius: 5px;">User Log</div>                                                                                                                                            | <p>Automatically maintains a log of user actions and input lock status. Log file can be downloaded using download utility.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <p><b>User Log</b> shows input lock and other user conditions (with most recent event at top of list).</p> <p><b>Clear User Log</b> clears all entries.</p> <p><b>Download Log File</b> opens a browser allowing the log file to be saved on the host machine.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## Uploading Firmware Using Web Interface and GUI

Firmware (such as upgrades, option keys, and presets .bin files) can be uploaded to BBG-1002-UDX directly via the web html5 interface without going through DashBoard (see Figure 3-7). In addition to allowing uploads without needing a DashBoard connection, this method transfers files typically much faster than using DashBoard.



**Figure 3-7 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-1050-EMDE-ANC Function Menu List and Descriptions) are available using the front panel display and arrow navigating buttons. Table 3-2 lists the menu structure and identifiers for these functions, along with page references for detailed information about the functions and its controls.

The front panel menus offers a true standalone means to configure the BBG-1050-EMDE-ANC with no connection to a network required, and is useful where changes need to be done immediately (or in emergency situations) without the benefit of network access. However, the web GUI provides 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 be used for all applications other than the most basic cases.

- Note:**
- When a setting is changed using either the menu described here or the web GUI remote control, settings displayed are the settings as effected by the device itself and reported back to the remote control; the value displayed at any time is the actual value as set on the device.
  - Items other than status displays have an additional submenu where a selection for the item can be made. Some submenu items listed in Table 3-2 have additional nested submenus (denoted by \*). These multiple-level submenus are not listed here; refer to the referenced page number for more information.

**Table 3-2 Front Panel User Menus**

| Menu>Submenu Items                                                                                                                                                                                                                                     | Menu>Submenu Items                                                                                                                | Menu>Submenu Items                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Status (pg 3-8)<br>Output Video<br>SDI Input A<br>SDI Input B<br>SDI Input C<br>SDI Input D<br>GPI 1<br>GPI 2<br>Reference<br>Card Voltage<br>Card Power<br>Card Temp(front)<br>Card Temp (rear)<br>Card Temp (FPGA)<br>Card Up Time<br>Preset Engaged | Product Info (pg 3-8)<br>Product<br>Product Options<br>Supplier<br>Revision<br>Build Date<br>FPGA Rev<br>FPGA Build Date<br>S/N   | Network Settings (pg 3-3)<br>IP Addr<br>Netmask<br>Gateway<br>Mode (DHCP/Stat) |
| Timecode (pg 3-11)<br>Ref VITC Status<br>Input VITC Status<br>Input ATC LTC Status<br>Input ATC VITC Status<br>Output Status                                                                                                                           | Presets (pg 3-21)<br>Save/Delete Mode<br>Select Preset<br>Load Selected Preset<br>Delete Selected Preset<br>Load Factory Defaults |                                                                                |

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## Troubleshooting

This section provides general troubleshooting information and specific symptom/corrective action for the BBG-1050-EMDE-ANC and its remote control interface. The BBG-1050-EMDE-ANC 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-1050-EMDE-ANC itself and its remote control provide error and failure indications. Depending on how the BBG-1050-EMDE-ANC 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.

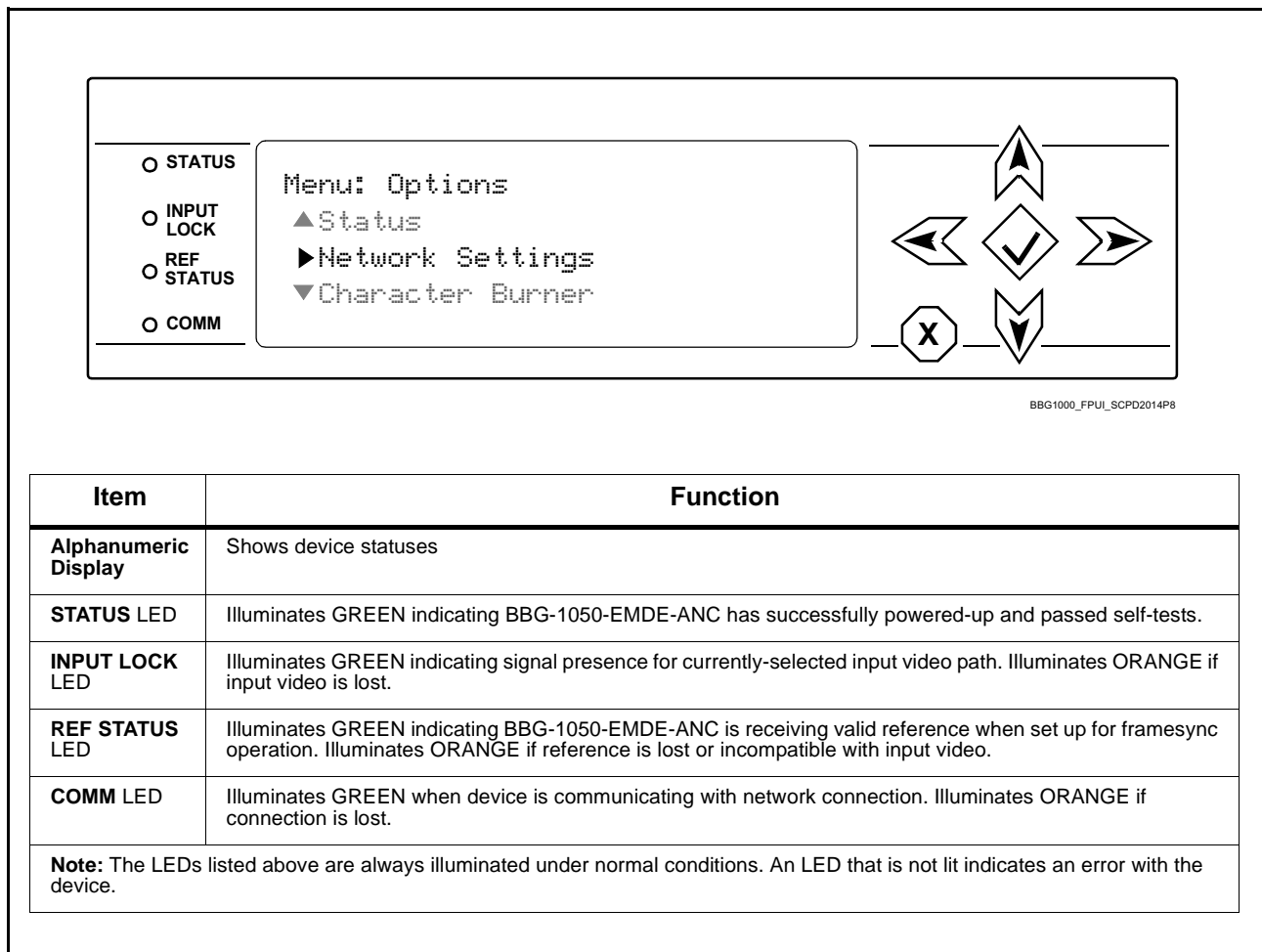
The various BBG-1050-EMDE-ANC device and remote control error and failure indicators are individually described below.

**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. 3-32)
- BBG-1050-EMDE-ANC Processing Error Troubleshooting (p. 3-32)

### BBG-1050-EMDE-ANC Front Panel Status/Error Indicators and Display

Figure 3-8 shows and describes the BBG-1050-EMDE-ANC 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.



**Figure 3-8 BBG-1050-EMDE-ANC 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Verify power presence and characteristics</b>               | <ul style="list-style-type: none"> <li>• On the BBG-1050-EMDE-ANC, 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.</li> <li>• Check the Power Consumed indication for the BBG-1050-EMDE-ANC. This can be observed using the Status front-panel or web UI pane.               <ul style="list-style-type: none"> <li>• If display shows <b>no</b> power being consumed, either the frame power supply, connections, or the BBG-1050-EMDE-ANC itself is defective.</li> <li>• If display shows <b>excessive</b> power being consumed (see Technical Specifications (p. 1-6) in Chapter 1, "Introduction"), the BBG-1050-EMDE-ANC may be defective.</li> </ul> </li> </ul> |
| <b>Check Cable connection secureness and connecting points</b> | 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.                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Check status indicators and displays</b>                    | On BBG-1050-EMDE-ANC 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Troubleshoot by substitution</b>                            | All devices can be hot-swapped, replacing a suspect device with a known-good item.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

## BBG-1050-EMDE-ANC Processing Error Troubleshooting

Table 3-4 provides BBG-1050-EMDE-ANC processing troubleshooting information. If the BBG-1050-EMDE-ANC 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-1050-EMDE-ANC is not appropriately set for the type of signal being received by the device.

**Note:** Where errors are displayed on both the BBG-1050-EMDE-ANC 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-1050-EMDE-ANC shows <b>Unlocked</b> message in BBG-1050-EMDE-ANC Info pane.                                 | No video input present                                                   | Make certain intended video source is connected to appropriate BBG-1050-EMDE-ANC video input. Make certain BNC cable connections are OK.                                                                                                                                                                                                      |
| Ancillary data (closed captioning, timecode) not transferred through BBG-1050-EMDE-ANC                          | • Control(s) not enabled                                                 | • Make certain respective control is set to <b>On</b> or <b>Enabled</b> (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.                                                                                                                                                                                                                                                        |
| Selected upgrade firmware will not upload                                                                       | Automatic reboot after upgrade turned off                                | Device <b>Presets &gt; Automatically Reboot After Upgrade</b> 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 ( <b>Presets</b> tab > <b>Event Triggers</b> sub-tab) should be set to <b>Disabled</b> 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 Presets (p. 3-21) for more information. |
| Device will not retain user settings, or setting changes or presets spontaneously invoke.                       | <b>Event Based Loading</b> sub-tab inadvertently set to trigger on event | If event based loading is not to be used, make certain <b>Event Based Presets</b> is disabled (either using master <b>Enable/Disable</b> control or through events settings. See Presets (p. 3-21) for more information.                                                                                                                      |

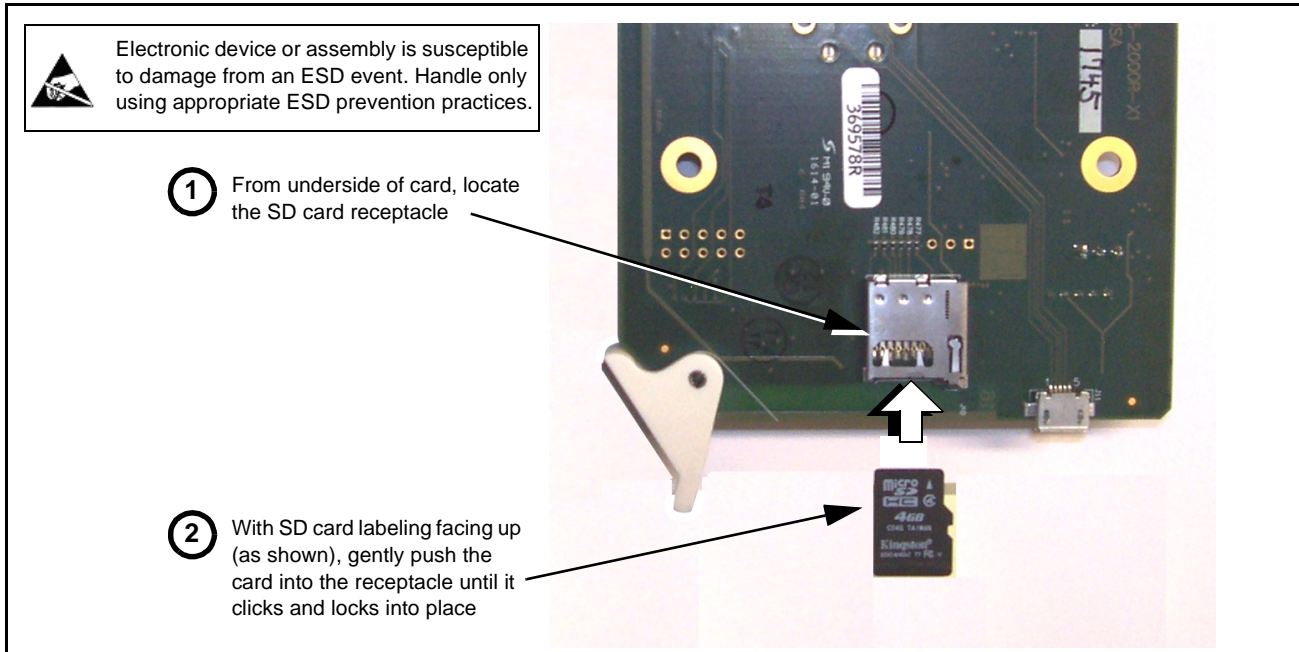
## In Case of Problems

### Recovering Device From SD Memory Card

New production devices 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 device should the device become unresponsive (can't communicate with Dashboard or other remote control). Recovering a device using the procedure here will restore the device to any installed option licenses and the most recent firmware installed.

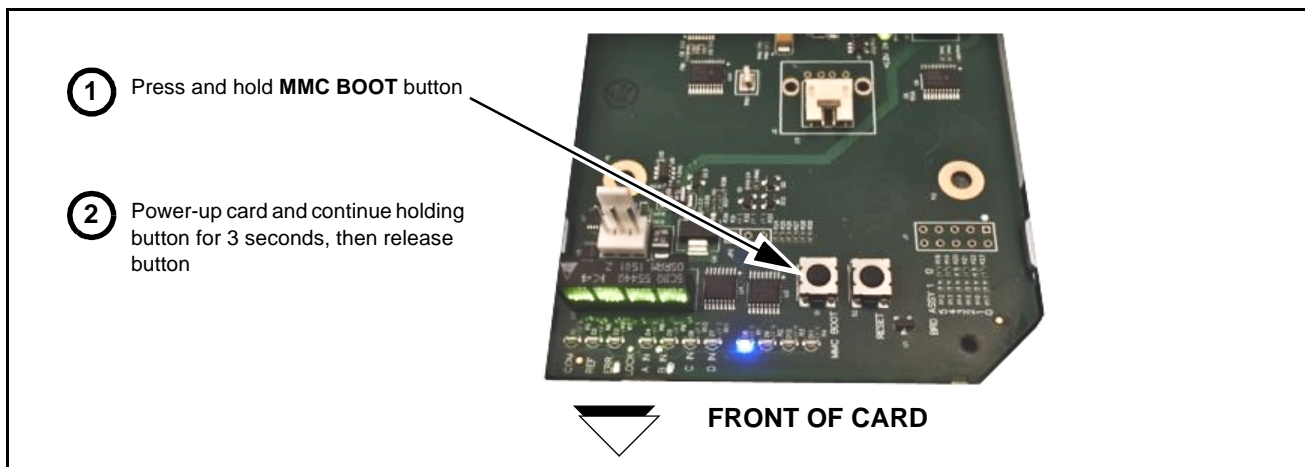
1. (See Figure 3-9.) Make certain the device has the proper SD card installed in the under-card slot. If SD card is **not** installed, contact Product Support to obtain an SD card.

- Note:**
- (Option +TTS only) Devices shipped with option +TTS use an SD card for the TTS library in addition to recovery files. If your +TTS-equipped device was received **earlier than December 2015**, your SD may not contain the recovery files. Contact Product Support to obtain the updated SD card containing both TTS library and SD recovery files.
  - If unit is a BBG-1000 Series device, remove the top cover before proceeding.



**Figure 3-9 SD Card Installation**

2. (See Figure 3-10.) With device powered-down, locate the **MMC BOOT** button on the card. Proceed as shown in picture.



**Figure 3-10 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 device 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. 1-9) in Chapter 1, “Introduction“ for contact information.

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