BBG-1023-DSK-LG

3G/HD/SD-SDI Standalone Downstream Keyer
with Dual Key/Fill Paths and Logo Insertion

Product Manual

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BBG-1023-DSKLG-OM (V1.3)

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Congratulations on choosing the Cobalt® BBG-1023-DSK-LG 3G/HD/SD-SDI Standalone Downstream Keyer with Dual Key/Fill Paths and Logo Insertion. The BBG-1023-DSK-LG 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-1023-DSK-LG, please contact us at the contact information on the front cover.

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Chapter 1

Introduction

Overview

This manual provides installation and operating instructions for the BBG-1023-DSK-LG 3G/HD/SD-SDI Standalone Downstream Keyer with Dual Key/Fill Paths and Logo Insertion unit (also referred to herein as the BBG-1023-DSK-LG).

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-1023-DSK-LG.
- **Chapter 2, "Installation"** – Provides instructions for installing the BBG-1023-DSK-LG and setting up its network access.
- **Chapter 3, "Setup/Operating Instructions"** – Provides overviews of operating controls and instructions for using the BBG-1023-DSK-LG.

This chapter contains the following information:

- **Cobalt Reference Guides (p. 1-2)**
- **Manual Conventions (p. 1-2)**
- **Safety and Regulatory Summary (p. 1-4)**
- **BBG-1023-DSK-LG Functional Description (p. 1-5)**
- **Technical Specifications (p. 1-8)**
- **Warranty and Service Information (p. 1-11)**
- **Contact Cobalt Digital Inc. (p. 1-12)**

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-1023-DSK-LG itself. Examples are provided below.

- Device display messages are shown like this:

  BBG-1023-DSK-LG

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

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

- **BBG-1023-DSK-LG** refers to the BBG-1023-DSK-LG 3G/HD/SD-SDI Standalone Downstream Keyer with Dual Key/Fill Paths and Logo Insertion unit.
- **Frame** refers to the HPF-9000, oGx, 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-1023-DSK-LG and other cards and devices operate.
- Functions and/or features that are available only as an option are denoted in this manual like this:

  Option

Warnings, Cautions, and Notes

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

Warnings

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

Cautions

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

Notes

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

Labeling Symbol Definitions

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

Safety and Regulatory Summary

Warnings

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

Cautions

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

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

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

CAUTION **The BBG-1023-DSK-LG 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-1023-DSK-LG Functional Description

Figure 1-1 shows a functional block diagram of the BBG-1023-DSK-LG. The BBG-1023-DSK-LG includes input routing to accommodate up to five 3G/HD/SD-SDI inputs (a single program input and two pairs of key/fill SDI inputs). The single program video input can be directed to either or both of two key/fill/logo insertion paths (**Path 1** and **Path 2**), allowing changing from one key/fill/insertion scheme to the other as desired. The BBG-1023-DSK-LG can also store up to four logo graphic files which can be flexibly inserted into either key/fill path. Two key/fill paths can be outputted simultaneously, with each path using uniquely different key/fill and logo insertions as desired.

KEY/FILL SDI IN 1 receives a key/fill pair that is used by Key/Fill Engine 1, and **KEY/FILL SDI IN 2** receives a key/fill pair that is used by Key/Fill Engine 2. Both of these engines are duplicated on both program paths, allowing Key/Fill Engine 1 or Key/Fill Engine 2 to be used on either program path as desired. Two independent character burn strings and timecode burn can be inserted on output video Path 1 and/or Path 2.

BBG-1023-DSK-LG Input/Output Formats

The BBG-1023-DSK-LG provides the following inputs and outputs:

- **Inputs:**
  - **PGM SDI IN** – 3G/HD/SD-SDI program video input
  - **KEY/FILL SDI IN 1** – 3G/HD/SD-SDI key/fill video input pair for key/fill engine 1
  - **KEY/FILL SDI IN 2** – 3G/HD/SD-SDI key/fill video input pair for key/fill engine 2
- **Outputs:**
  - **SDI OUT 1** and **SDI OUT 2** – Two SDI outputs which can carry **Path 1** and **Path 2** simultaneously, or serve as a 2x DA for either path output
  - **HDMI/DVI OUT** – HDMI/DVI preview out (video only)

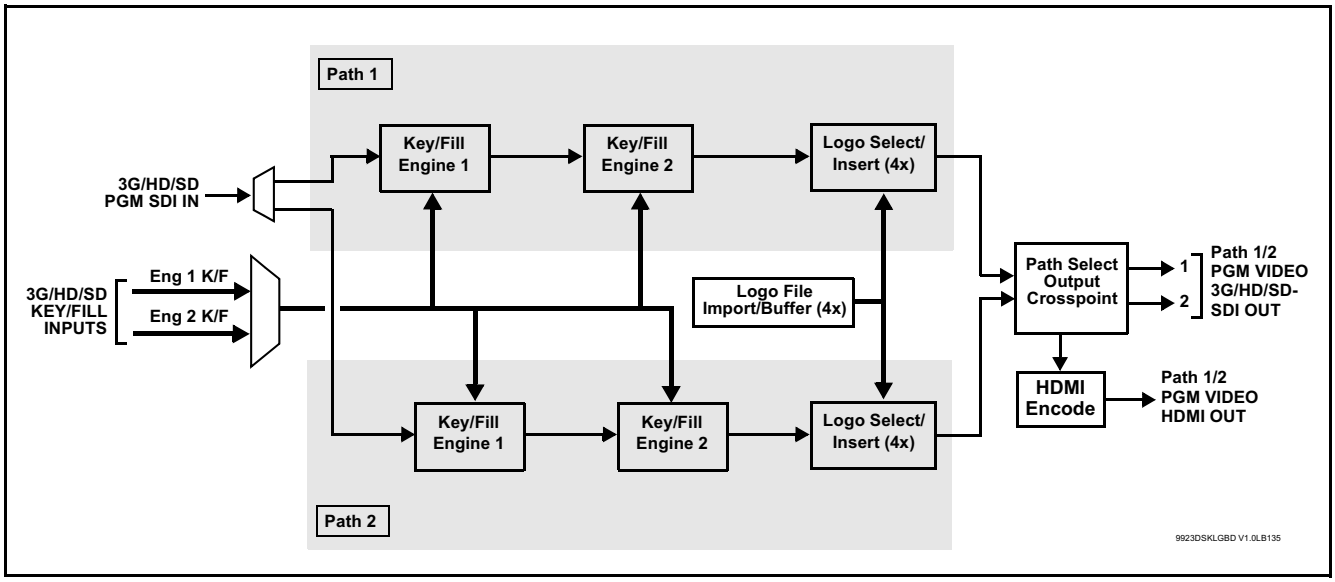

Figure 1-1 BBG-1023-DSK-LG Functional Block Diagram

Video Processor Description

Key/Fill Insertion

Two independent key/fill engines (**KEYER 1** and **KEYER 2**) are available which can be independently applied to either of the output processing paths (**PATH 1** or **PATH 2**). The keyer engines each are equipped with a corresponding pair of SDI key/fill inputs. This function provides chroma keying using the **KEY VID IN** signal. The **FILL VID IN** signal provides the fill video that is inserted in the area “cleared out” by the key. The keying user interface displays key and fill timing relative to the device output video, allowing timing offset to be adjusted such that key and fill can be properly framed. (The device key/fill engines do not provide timing offset control of the key/fill video nor the program video; offset must be provided by external frame sync cards or devices controlling the key/fill and program video feeds.)

Alpha threshold keyer modes allow full-color key/fill from cost-effective generic sources such as a standard PC (with appropriate HDMI-to-SDI output conversion) hosting simple .png graphic files. In these modes, a common key/fill SDI input provides both the key and fill input.

Character Burn-in Functions

User text, video format, and timecode can be burned into the output video. Burn-in attributes such as size, position, background, color, and opacity are user-configurable. Two independent character burn strings can be inserted on output video path 1 and/or path 2.

Logo Insertion

(See Figure 1-2.) This function provides for graphic insertion onto the SDI processed output raster. Up to four independent images can be stored on the device, of which any of the four images (“slates”) can be applied to program video on processing paths **PATH 1** or **PATH 2**.The function allows for uploading your .png image graphic file to the device memory. (png files are converted to a special format using a web tool before uploading to the host device; this is described in the setup/operating instructions later in this manual.)

When the image file(s) is uploaded to the device, its insertion can be enabled via DashBoard Event Setup controls that enable the graphic insertion only under certain conditions as desired. (For example, a logo graphic can be set to insert upon receiving an hourly station ID GPI, and then disable using the same GPI.)

This function allows for positioning the image within the active video using DashBoard controls (which are described in the setup/operating instructions later in this supplement).

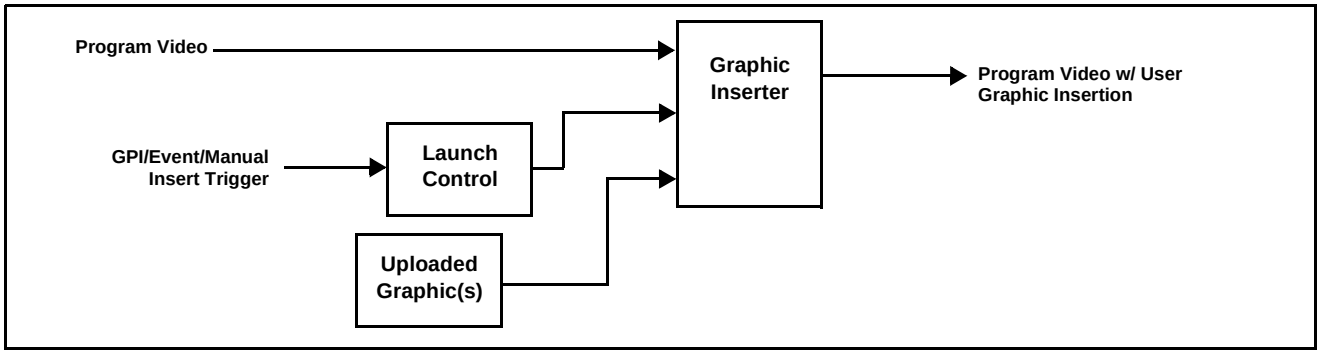

Figure 1-2 Graphic Insertion Simplified Functional Diagram

Output Routing Function

This function provides a crosspoint for the **PATH 1** and **PATH 2** processing paths for routing to the device **SDI OUT 1**, **SDI OUT 2**, and **HDMI OUT** output ports. When different processing paths are set up for different key/fill or logo insertion aspects, selecting from **PATH 1** or **PATH 2** instantly engages the desired processing. (The output routing selections can be stored and correlated to a preset, or correlated to a GPI condition that invokes the desired processing and path-to-output connections.)

All embedded audio and ancillary data on the program paths are maintained intact by the device processing and passed unaffected.

User Control Interface

GPI Interface

Five independent GPI inputs (**GPI 1** thru **GPI 5**) are available. Using a **GPI Setup** user interface, GPI states (accommodating both level and edge-trigger conditions) can be defined on the user interface to define up to 16 GPI conditions using the five available GPI inputs. These GPI conditions can in turn be used to invoke any of the device control, processing, and/or routing aspects by directly correlating the GPI to the processing aspect, or indirectly by invoking a custom user preset correlated to the GPI condition. Using GPI correlated to user presets, the GPI event invokes a user-defined preset which is highly flexible and totally user-defined. Invoking a user preset to effect a change involves device setup communication limited **only** to the items being changed; the device remains on-line during the setup, and the called preset is rapidly applied.

Device Remote Control

BBG-1023-DSK-LG 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-1023-DSK-LG 3G/HD/SD-SDI Standalone Downstream Keyer with Dual Key/Fill Paths and Logo Insertion unit.

Table 1-1 Technical Specifications

Item	Characteristic
Part number, nomenclature	**BBG-1023-DSK-LG** 3G/HD/SD-SDI Standalone Downstream Keyer with Dual Key/Fill Paths and Logo Insertion available in the following rear-panel I/O configurations: - **BBG-1023-DSK-LG-C-DIN** (1) 3G/HD/SD-SDI Program Video Input, (4) 3G/HD/SD-SDI Key/Fill Video Inputs (2 key/fill pairs), (2) 3G/HD/SD-SDI Program Video Outputs (user selectable as path 1 or path 2 key/fill program outputs), (1) HDMI/DVI Preview Output, (1) GPI Port (HD-15), (all coaxial connectors DIN1.0/2.3) - **BBG-1023-DSK-LG-C-HDBNC** (1) 3G/HD/SD-SDI Program Video Input, (4) 3G/HD/SD-SDI Key/Fill Video Inputs (2 key/fill pairs), (2) 3G/HD/SD-SDI Program Video Outputs (user selectable as path 1 or path 2 key/fill program outputs), (1) HDMI/DVI Preview Output, (1) GPIO Port (HD-15), (all coaxial connectors HD-BNC)

Table 1-1 Technical Specifications — continued

Item	Characteristic
Power consumption	< 18 Watts maximum. Power provided by included AC adapter; 100-240 VAC, 50/60 Hz. Second DC power connection allows power redundancy using second (optional) AC adapter.
Installation Density	Up to 3 units per 1RU space
Environmental: Operating temperature: Relative humidity (operating or storage): Dimensions (WxHxD): Weight:	 32° – 104° F (0° – 40° C) < 95%, non-condensing 5.7 x 1.4 x 14.7 in (14.5 x 3.5 x 37.3 cm) Dimensions include connector projections. 6 lb (2.8 kg)
Ethernet communication	10/100/1000 Mbps Ethernet with Auto-MDIX via HTML5 web interface
Front-Panel Controls and Indicators	Backlit LCD display and menu navigation keys. Display and controls provide unit status display and full control as an alternate to web GUI control.
SDI Video Inputs	One program video 3G/HD/SD-SDI video input; four (2 pairs) key/fill 3G/HD/SD-SDI video inputs Data Rates Supported: SMPTE 424M, 292M Impedance: 75 Ω terminating Receive Cable Length: 3G/HD-SDI: 120/180 m (Belden 1694A) Return Loss (SDI): > 15 dB up to 1.485 GHz > 10 dB up to 2.970 GHz

Table 1-1 Technical Specifications — continued

Item	Characteristic
SDI Video Outputs	Number of Outputs: Two 3G/HD-SDI Impedance: 75 Ω Return Loss: > 15 dB at 5 MHz – 270 MHz Signal Level: 800 mV ± 10% DC Offset: 0 V ± 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
HDMI Processed Video Output	HDMI CEA-861D (video only)
GPI	(5) GPI; opto-isolated GPI Specifications: GPI LO @ Vin < 1.5 V GPI HI @ Vin > 2.3 V Max Vin: 9 V
Redundant (or spare) AC power supply	BBG-1000-PS

Warranty and Service Information

Cobalt Digital Inc. Limited Warranty

This product is warranted to be free from defects in material and workmanship for a period of five (5) years from the date of shipment to the original purchaser, except that 4000, 5000, 6000, 8000 series power supplies, and Dolby® modules (where applicable) are warranted to be free from defects in material and workmanship for a period of one (1) year.

Cobalt Digital Inc.'s (“Cobalt”) sole obligation under this warranty shall be limited to, at its option, (i) the repair or (ii) replacement of the product, and the determination of whether a defect is covered under this limited warranty shall be made at the sole discretion of Cobalt.

This limited warranty applies only to the original end-purchaser of the product, and is not assignable or transferrable therefrom. This warranty is limited to defects in material and workmanship, and shall not apply to acts of God, accidents, or negligence on behalf of the purchaser, and shall be voided upon the misuse, abuse, alteration, or modification of the product. Only Cobalt authorized factory representatives are authorized to make repairs to the product, and any unauthorized attempt to repair this product shall immediately void the warranty. Please contact Cobalt Technical Support for more information.

To facilitate the resolution of warranty related issues, Cobalt recommends registering the product by completing and returning a product registration form. In the event of a warrantable defect, the purchaser shall notify Cobalt with a description of the problem, and Cobalt shall provide the purchaser with a Return Material Authorization (“RMA”). For return, defective products should be double boxed, and sufficiently protected, in the original packaging, or equivalent, and shipped to the Cobalt Factory Service Center, postage prepaid and insured for the purchase price. The purchaser should include the RMA number, description of the problem encountered, date purchased, name of dealer purchased from, and serial number with the shipment.

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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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Chapter 2

Installation

Overview

This chapter contains the following information:

- Installing the BBG-1023-DSK-LG (p. 2-1)
- Rear Panel Connections (p. 2-2)
- GPI Connections (p. 2-4)

Installing the BBG-1023-DSK-LG

Note:
- Where BBG-1023-DSK-LG 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-1023-DSK-LG in locations marked with stamped “x”. If feet are not affixed, chassis bottom cooling vents will be obscured.
- Where BBG-1023-DSK-LG 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-1023-DSK-LG to be mounted and securely attached to a 1 RU tray that fits into a standard EIA 19” rack mounting location. Install BBG-1023-DSK-LG unit into tray as described and shown here.

1. If installing BBG-1023-DSK-LG using optional frame Mounting Tray BBG-1000-TRAY, install BBG-1023-DSK-LG in tray as shown in Figure 2-1.

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

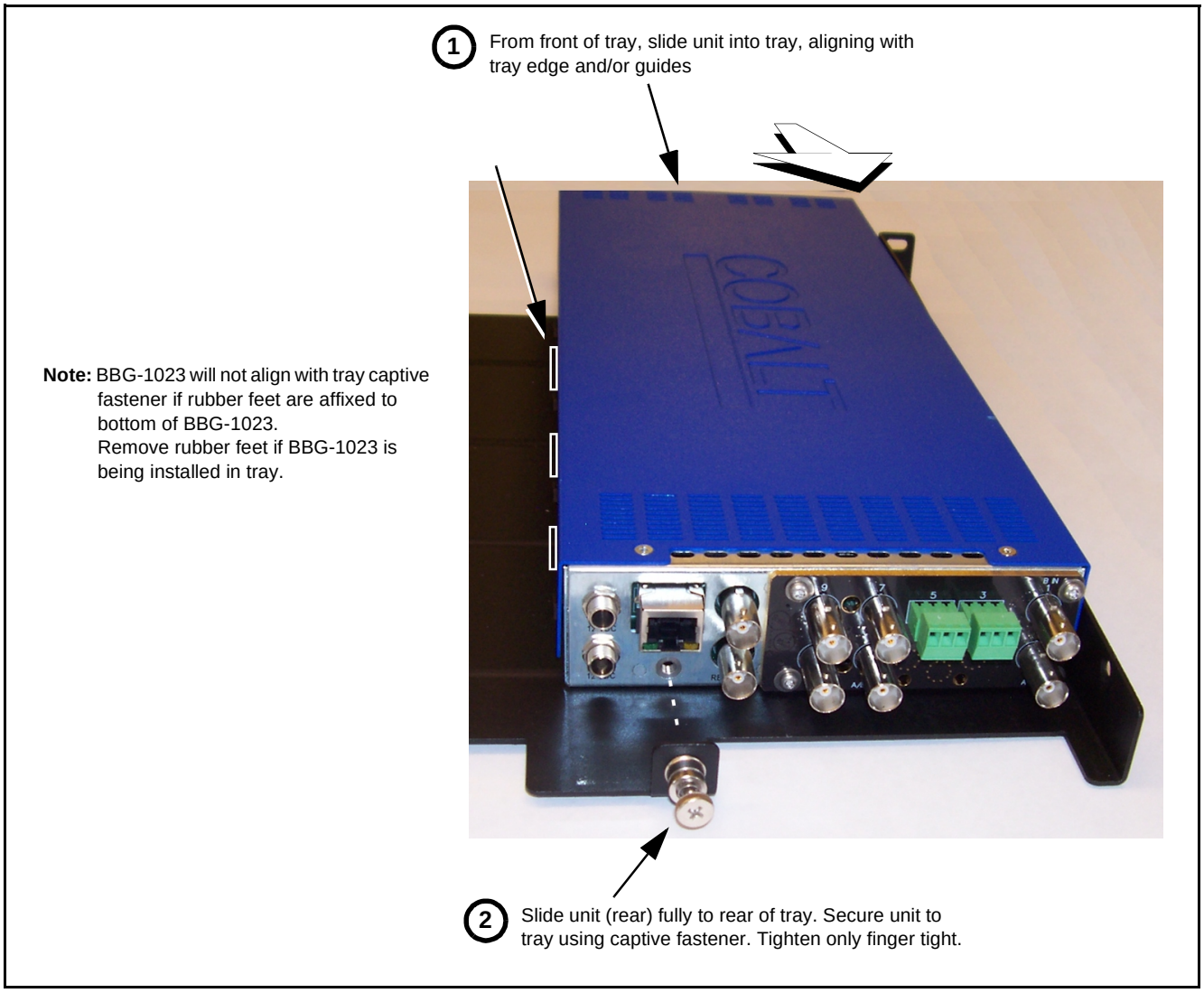


Figure 2-1 Mounting BBG-1023-DSK-LG Using Frame Mounting Tray

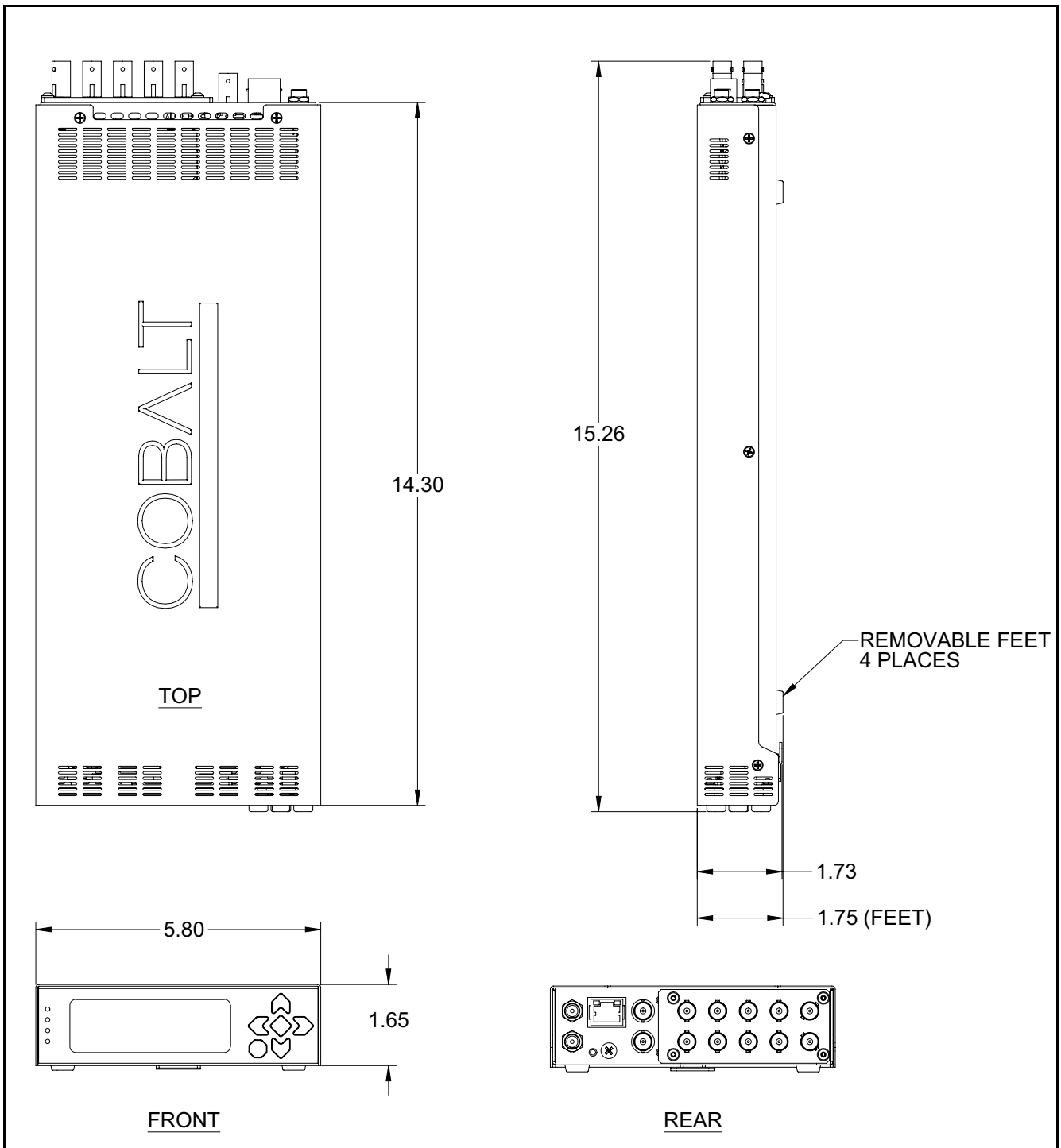
BBG-1023-DSK-LG Unit Dimensions

Figure 2-2 shows the BBG-1023-DSK-LG physical dimensions and mounting details for cases where BBG-1023-DSK-LG will be installed in a location not using the optional **BBG-1000-TRAY** mounting tray.

Rear Panel Connections

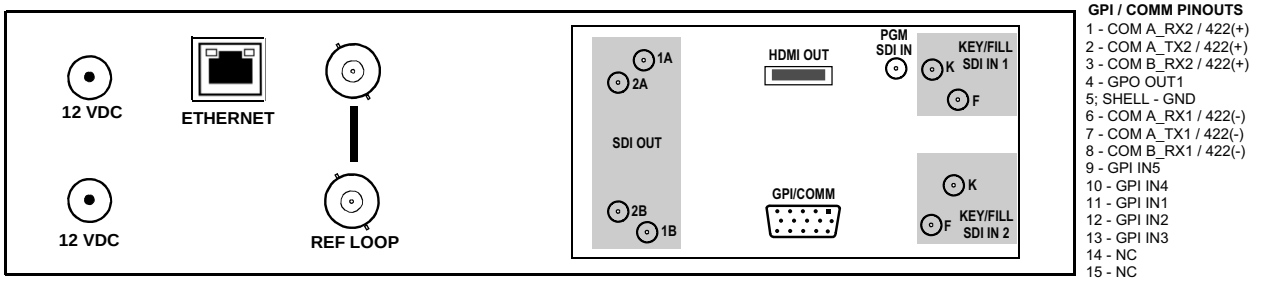
Perform rear panel cable connections as shown in Figure 2-3.

Note: The BBG-1023-DSK-LG BNC inputs are internally 75-ohm terminated. It is not necessary to terminate unused BNC video inputs or outputs.



Notes: 1. All dimensions in inches.
2. If BBG-1023 is mounted on flat surface, either rubber feet must be installed, or mounting surface must be open to mate with cooling vents on bottom of BBG-1023 chassis.

Figure 2-2 BBG-1023-DSK-LG Dimensional Details



Connector	Function
12 VDC − ⊂ +	Dual DC power IN connectors (diode-isolated). Single AC adapter (supplied) can be connected to either connector. Dual adapters can be connected to provide power redundancy.
10/100/1000 ETHERNET	Gigabit Ethernet control/monitoring connection. Communication activity status is shown by integral status LEDs.
REF LOOP	Looping 75Ω reference connection (BBG-1023-DSK-LG is not equipped with frame sync or ref lock)
Signal Connectors	
PGM SDI IN	Program Video SDI Input
KEY/FILL SDI IN 1 and **KEY/FILL SDI IN 2**	Four (2-pair) Key/Fill Video SDI Inputs (**KEY/FILL SDI IN 1** and **KEY/FILL SDI IN 2**)
SDI OUT 1 and **SDI OUT 2**	Two 3G/HD/SD-SDI Processed Video Out (Path 1 and/or Path 2)
HDMI OUT	HDMI Video Out (Path 1 or Path 2; video only)
GPI	HD-15 GPI connector (**GPI 1** thru **GPI 5**) Note: See Figure 2-4 for connector pinouts.

Figure 2-3 BBG-1023-DSK-LG Rear Panel Connectors

GPI Connections

Figure 2-4 shows connections to the **GPI** HD-15 connector.

Pin	Function
1-4	NC
5	GND
6-8	NC
9	GPI 5
10	GPI 4
11	GPI 1
12	GPI 2
13	GPI 3
14-15	NC

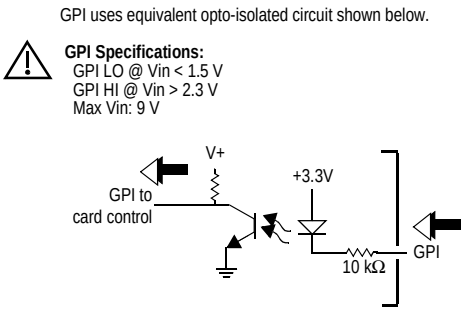


Figure 2-4 GPI Connector Pinouts

Chapter 3

Setup/Operating Instructions

Overview

This chapter contains the following information:

- BBG-1023 Front Panel Display and Menu-Accessed Control (p. 3-1)
- Connecting BBG-1023 To Your Network (p. 3-3)
- Control and Display Descriptions (p. 3-5)
- Checking BBG-1023-DSK-LG Device Information (p. 3-8)
- BBG-1023-DSK-LG Function Menu List and Descriptions (p. 3-9)
- Uploading Firmware Using Web Interface and GUI (p. 3-30)
- Front Panel User Menus (p. 3-31)
- Troubleshooting (p. 3-32)

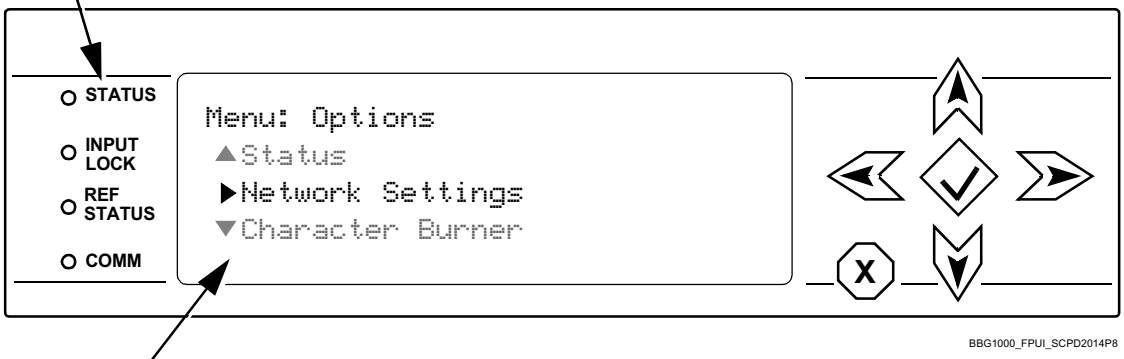
Perform the setup procedures here in the sequence specified. All procedures equally apply to all models unless otherwise noted.

Note: All instructions here assume BBG-1023 is physically connected to the control physical network as described in Chapter 2. Installation.

BBG-1023 Front Panel Display and Menu-Accessed Control

Figure 3-1 shows and describes the BBG-1023 front panel displays and menu-accessed user interface controls. Initial network setup is performed using these controls.

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



BBG1000_FPUI_SCPD2014P8

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

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

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

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

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

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

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

```
IP
010.099.011.162
```

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

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

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

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

Figure 3-1 BBG-1023 Front Panel Display and Menu Controls

Connecting BBG-1023 To Your Network

BBG-1023 ships with network protocol set to DHCP and populates its address with an addressed allocated by your DHCP server. If your network does not have a DHCP server, the BBG-1023 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-1023 To Network

1. Power-up BBG-1023 and connect Ethernet cable connection to media. Wait for BBG-1023 to complete booting. When **`Product: BBG-1023`** ... is displayed, device is ready for configuration.

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

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

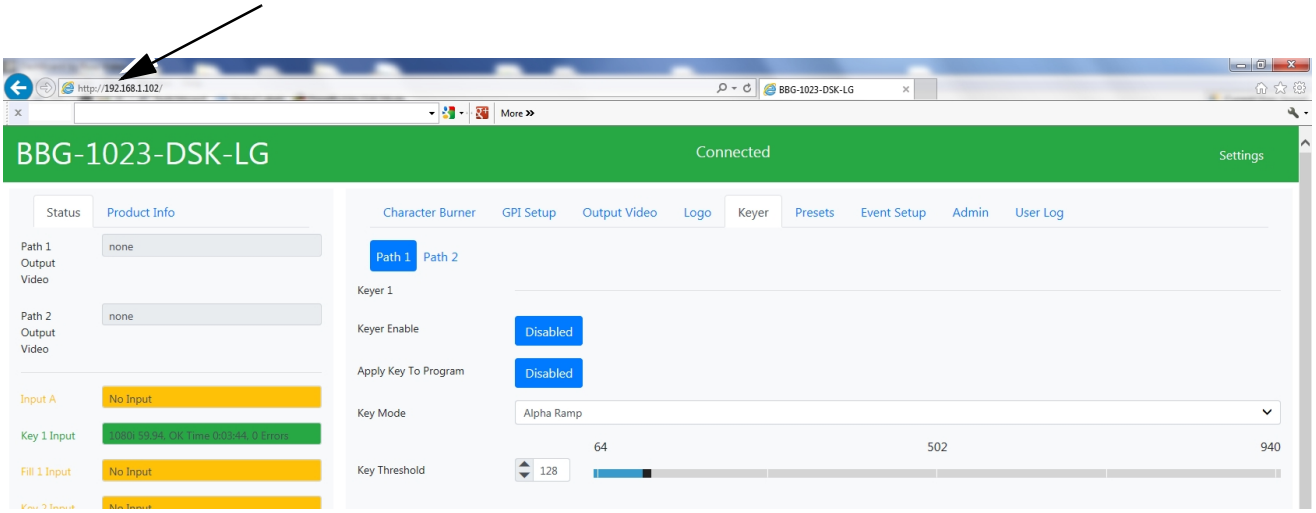
4. Configure the following fields as desired and appropriate for your network connection (examples shown below).

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

5. Press X to commit changes and exit the setup menu.
Note: Current IP address of BBG-1023 can now be checked from the front panel by accessing this at any point.

6. At this point, BBG-1023 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-1023



Finding a BBG-1023 Device in DashBoard

(See Figure 3-2) If BBG-1023 is configured with an address within a network also available via DashBoard, a BBG-1023 device appears as a frame entity in the DashBoard Basic Tree View.

Note: BBG-1023 DashBoard remote control is also available by opening the device in DashBoard similar to opening an openGear® card.

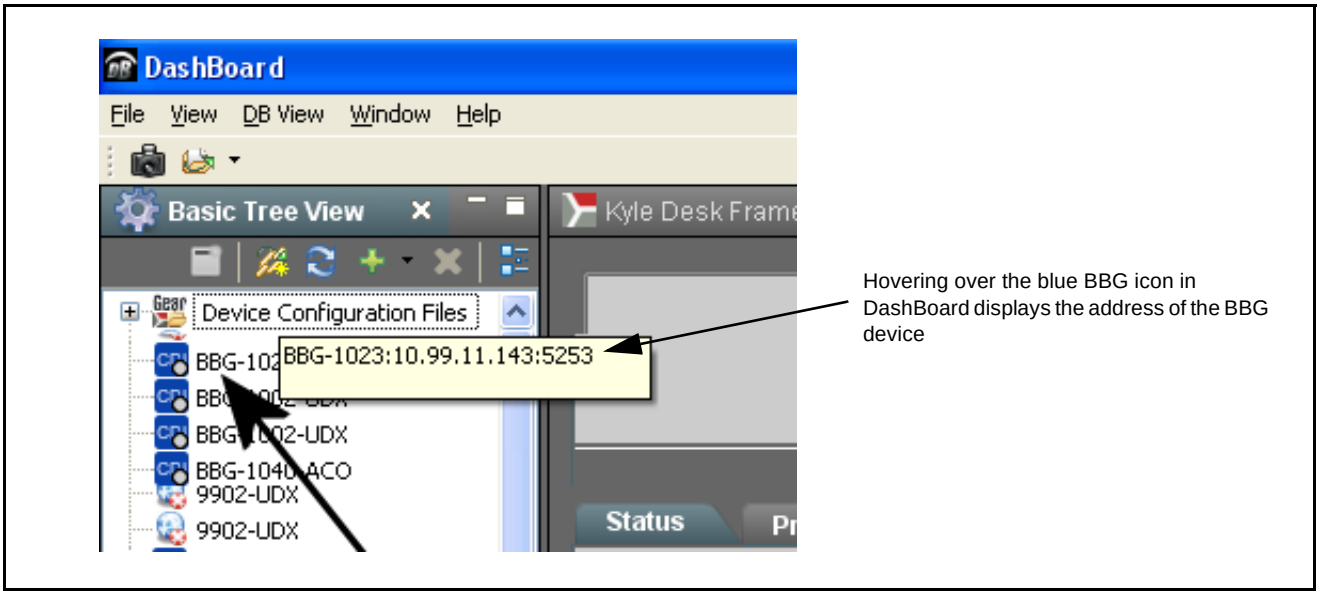


Figure 3-2 Finding BBG-1023 Using DashBoard

Control and Display Descriptions

This section describes the web user interface controls for using the BBG-1023-DSK-LG.

The format in which the BBG-1023-DSK-LG 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-1023-DSK-LG device are organized into function **menus**, which consist of parameter groups as shown below.

Figure 3-3 shows how the BBG-1023-DSK-LG device and its menus are organized, and also provides an overview of how navigation is performed between devices, function menus, and parameters.

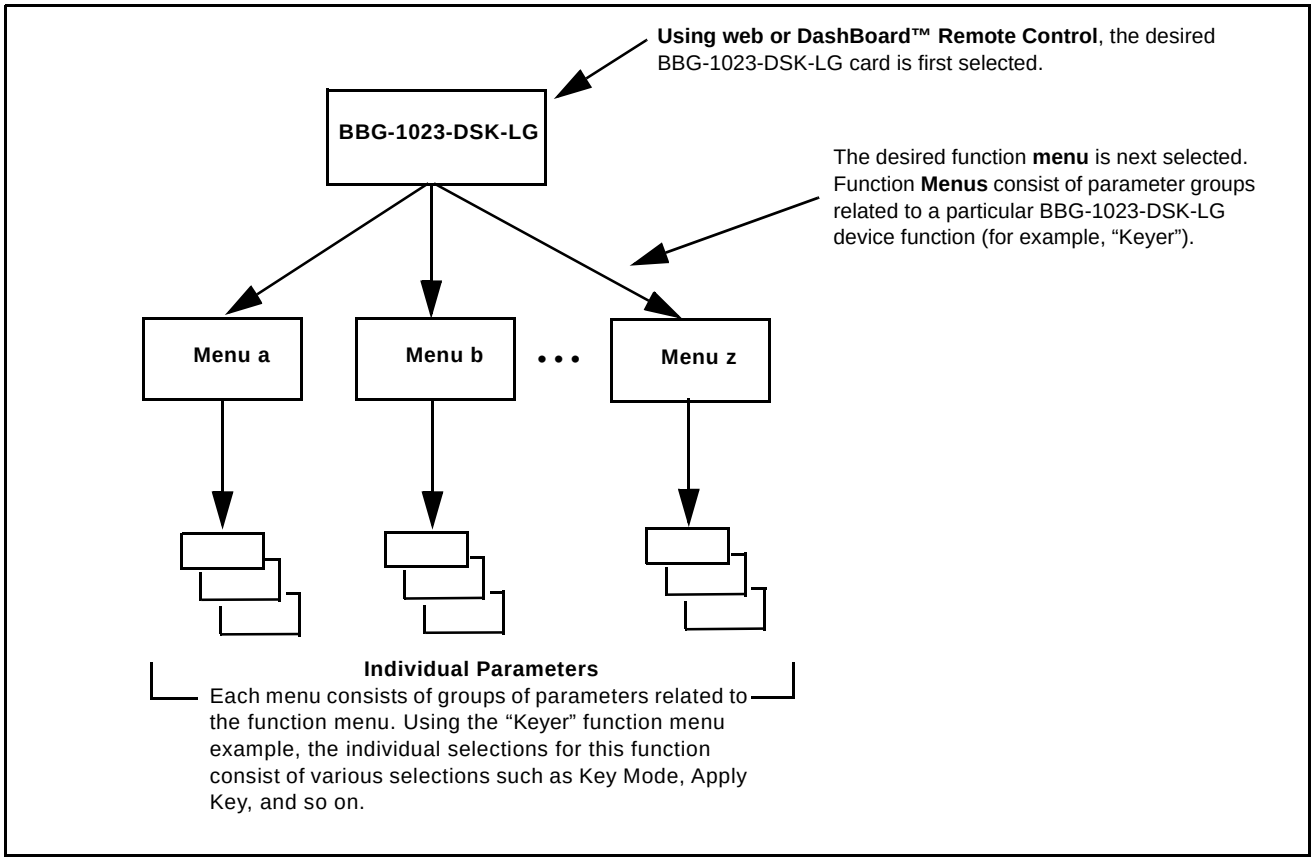
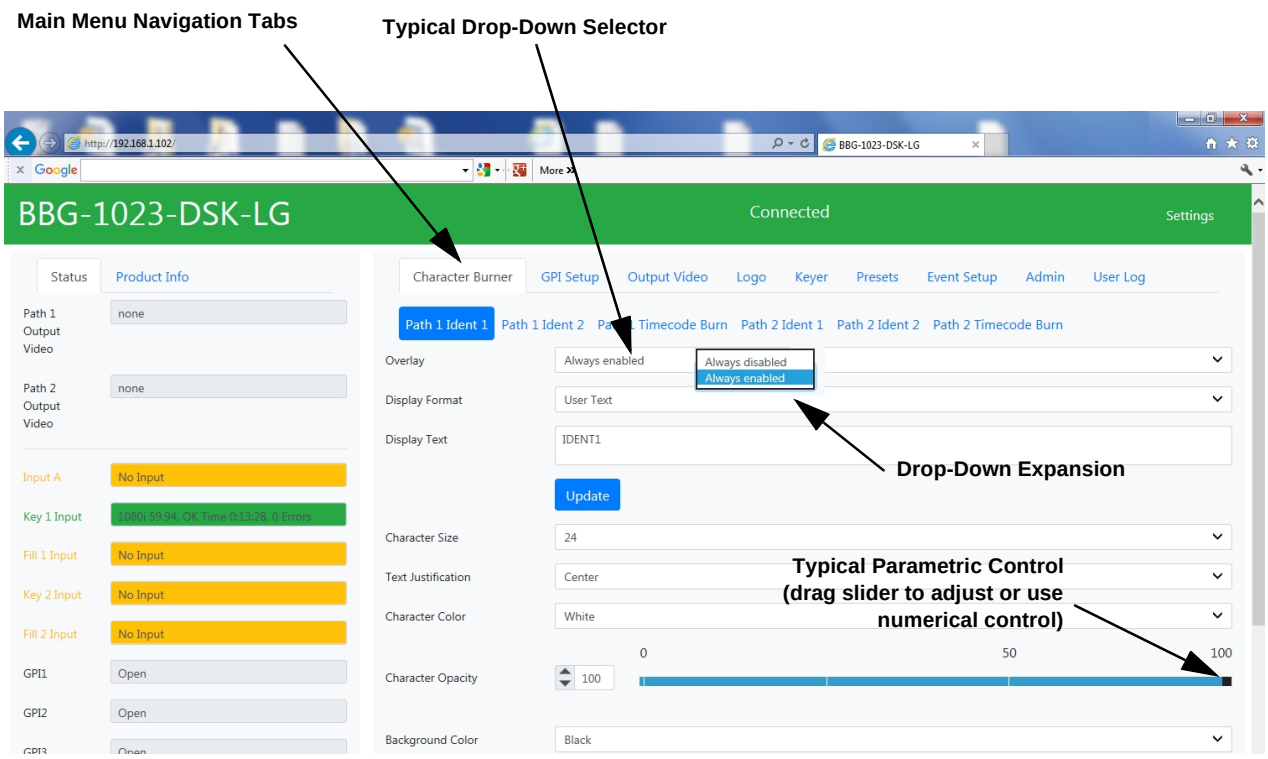


Figure 3-3 Function Submenu/Parameter Submenu Overview

Web User Interface

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



In this example, the **Character Burner** main menu tab is selected, with the overall pane now showing all sub-menu items related to the character burner 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-1023 user interface theme selection offers light and dark themes suited for various users and environments.

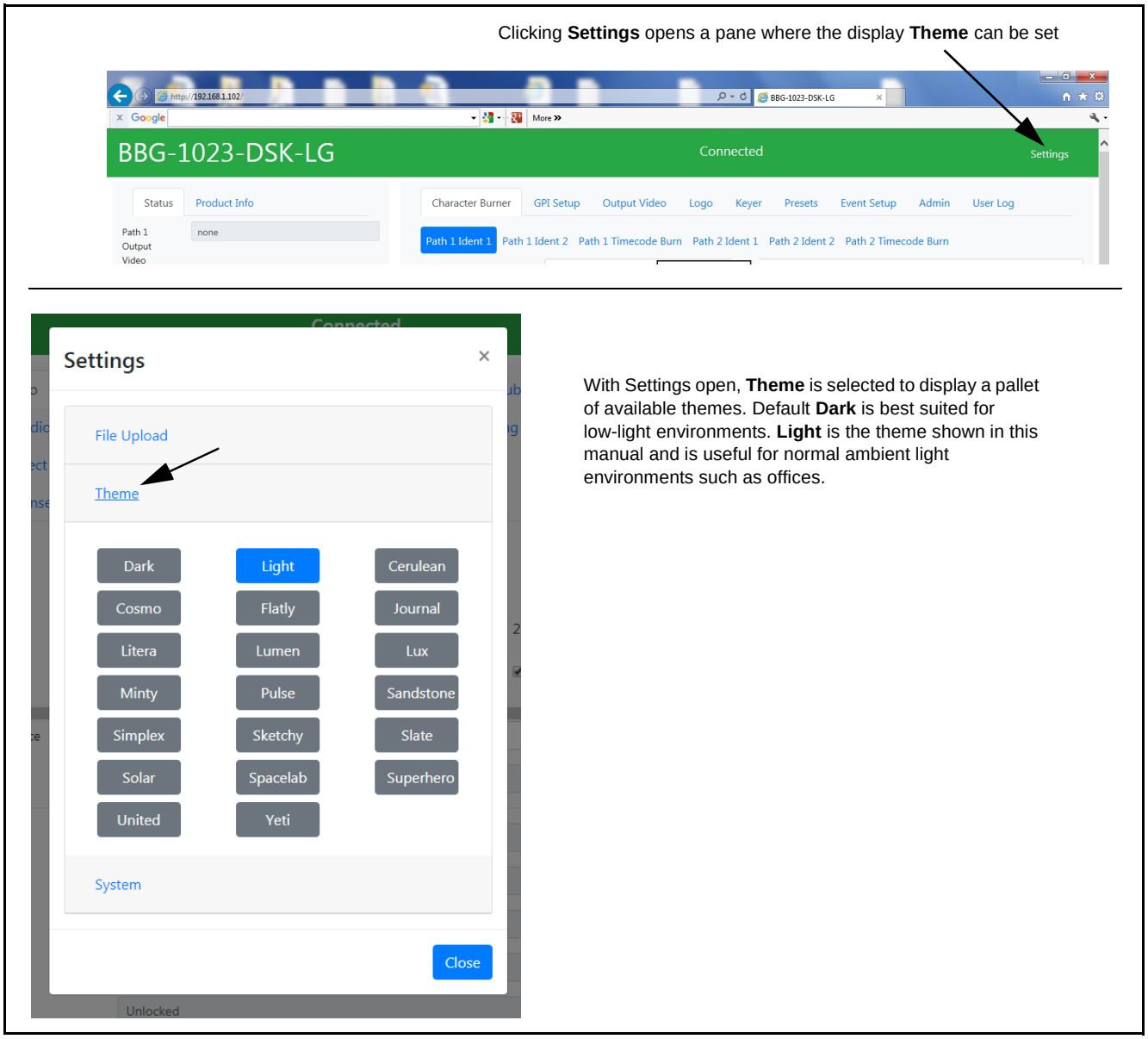


Figure 3-5 Web UI Display Themes

Checking BBG-1023-DSK-LG Device Information

The operating status and software version the BBG-1023-DSK-LG device can be checked by clicking the **Status** main menu tab. Figure 3-6 shows and describes the BBG-1023-DSK-LG 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. 3-32) for corrective action.

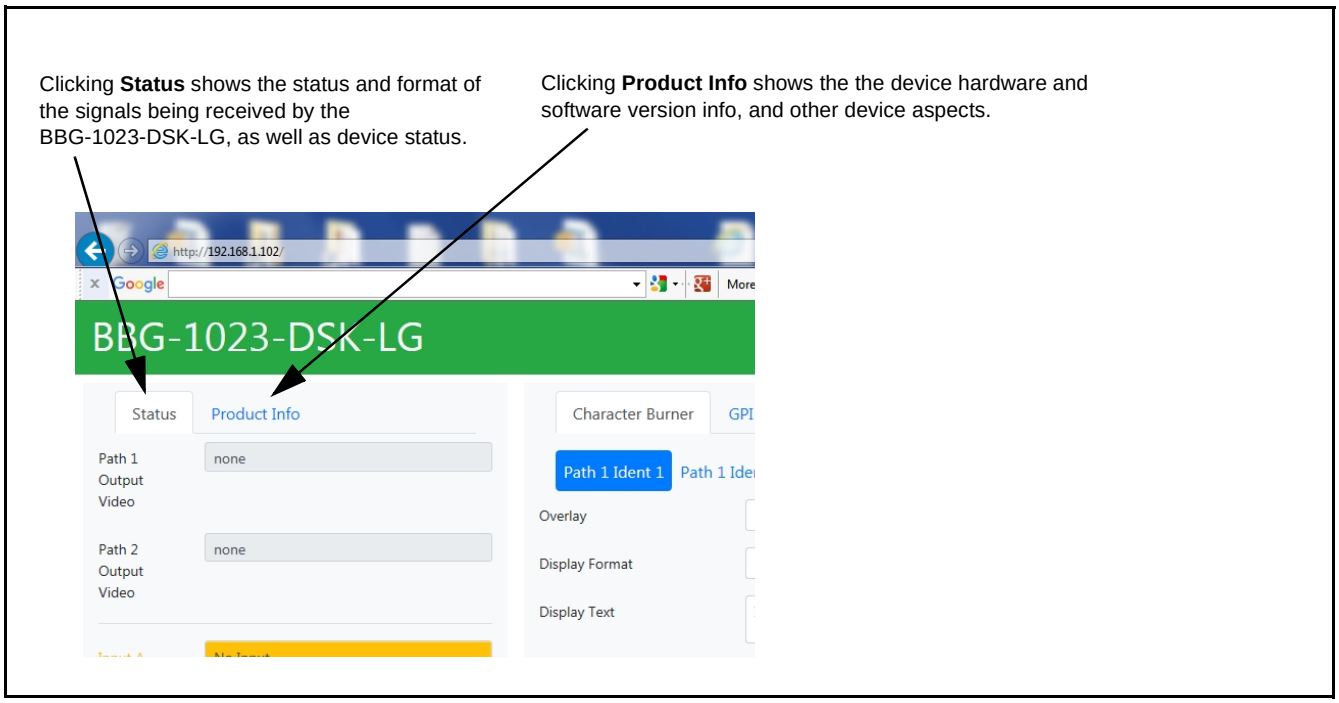


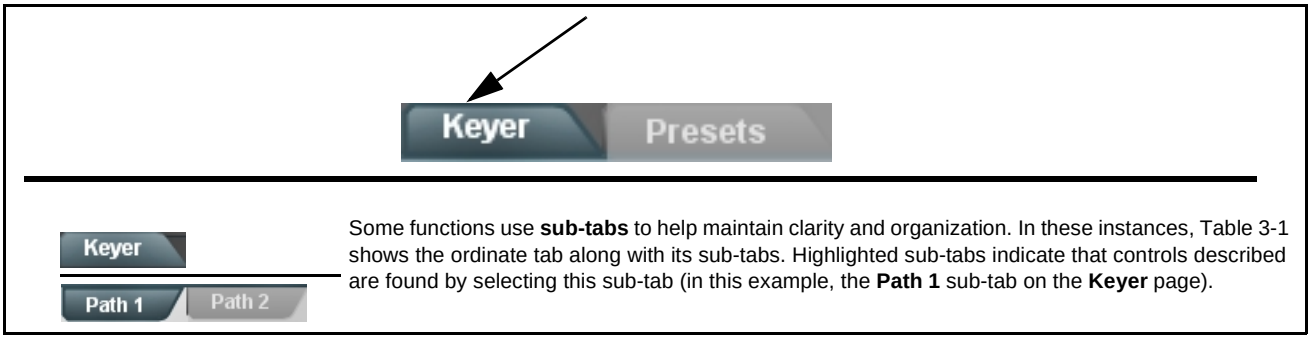
Figure 3-6 Typical Device Info/Status Utility

BBG-1023-DSK-LG Function Menu List and Descriptions

Table 3-1 individually lists and describes each BBG-1023-DSK-LG 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 is 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 Main Menu Item	Page	Function Main Menu Item	Page
Character Burner	3-10	Presets	3-21
GPI Setup Controls	3-15	Event Setup Controls	3-23
Output Video Routing Controls	3-16	Admin	3-27
Logo Upload/Insertion Controls	3-17	User Log	3-29
Keyer	3-19		

Table 3-1 BBG-1023-DSK-LG Function Menu List

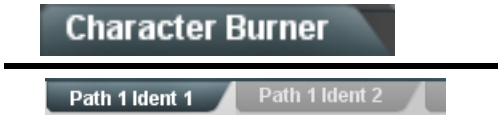
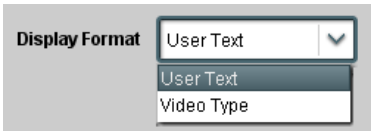
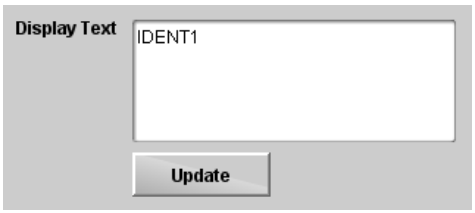
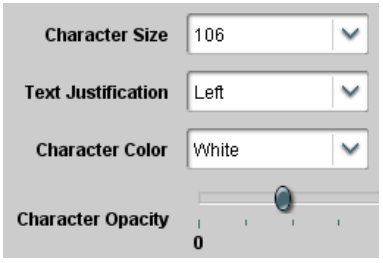
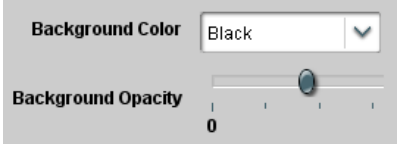
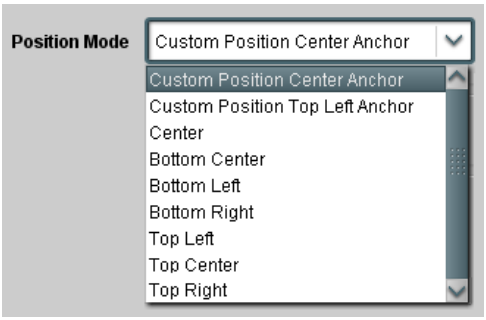
	Provides user-configurable burn-in of up to two text strings and timecode on output video.
Note: • **Character Burner** tab has identical independent controls for both Path 1 and Path 2 using the respective **Path 1 / Path 2** sub-tabs. Therefore, only the **Path 1** controls are shown here. Set controls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

Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

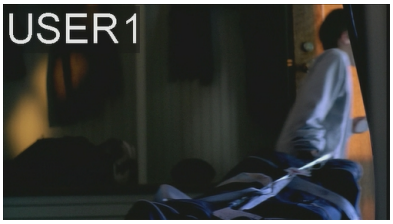
(continued)

- **Ident Position Select**

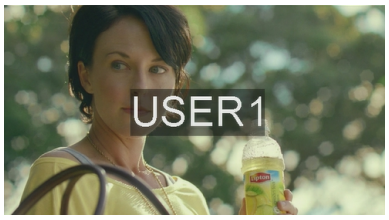


Sets the location of the ident text insertion from choices shown or custom. (When Custom is selected, position is configured using the **Ident Text Positioning Controls** described below.)

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

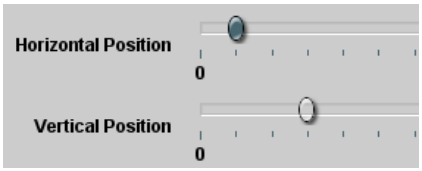


Example: Ident 1 text using **Center** position



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

- **Ident Text Positioning Controls**



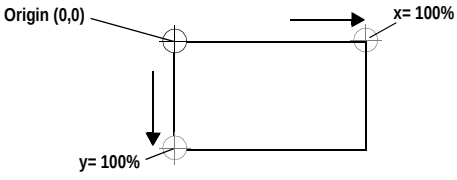
With Custom selected, sets burn-in position attributes as follows:

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

Note:
- Horizontal and Vertical Position controls are functional only when **Custom Position** is selected.
- Character sizing and positioning for a given raster format may not be appropriate for another format (especially if transitioning from HD to SD). Set size and position for a balanced appearance (e.g., do not place text too close to margins or set larger than necessary) that accommodates both HD and SD raster formats if multiple format use is required.

Positioning with H and V controls at zero (origin)
(Size = 3)

Positioning with H and V controls both at 50
(Size = 3)



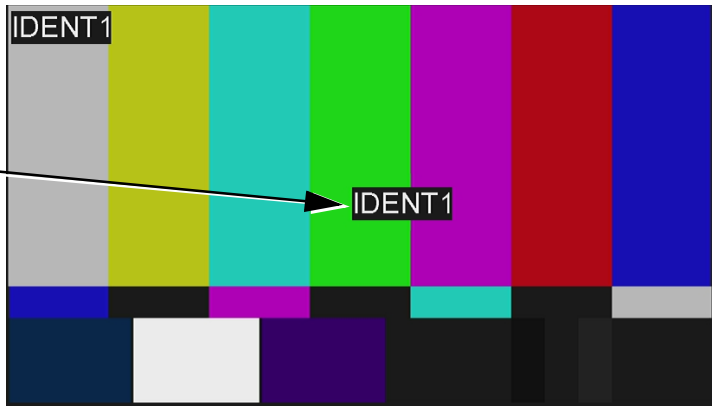


Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

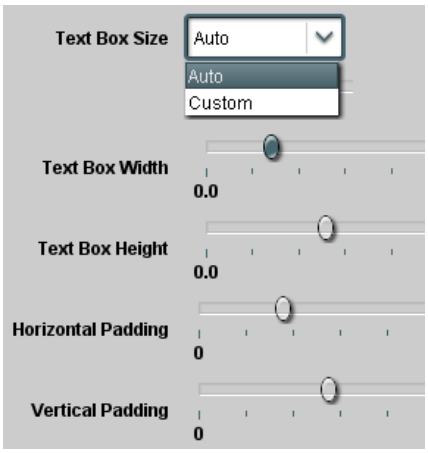
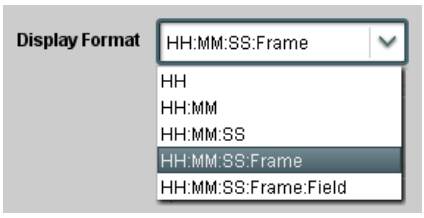
	(continued)
• **Text Box Sizing Controls** 	Provides controls for setting the size of the burn-in text background box. • **Auto** allows text box to proportionally size with selected text size. • **Custom** allows override of proportional sizing and allows text V and H dimensions to be set as desired. • **Text Box Width** and **Height** allow manual sizing when set to **Custom**. • **Custom** allows override of proportional sizing and allows text V and H dimensions to be set as desired. • **Horizontal** and **Vertical Padding** allow fine adjustment of V and H dimensions to be set when **Auto** is selected.
• **Text Box Border Enable** 	When set to Enabled, applies a white hairline border to the text box edges.
	Provides controls for burn-in of timecode on output video.
• **Timecode Insertion Control** 	Enables or disables timecode burn-in overlay insertion into output video.
• **Timecode Format Display Selector** 	Selects the format of timecode string burn-in overlay insertion into output video from choices shown.

Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

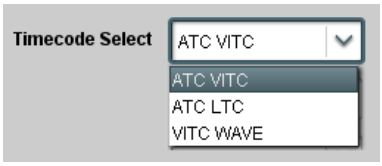
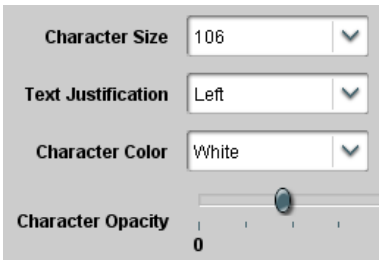
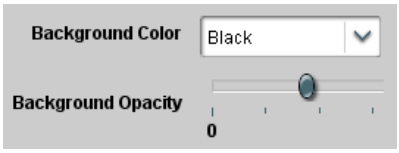
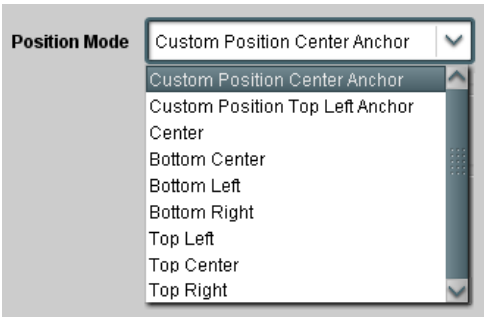
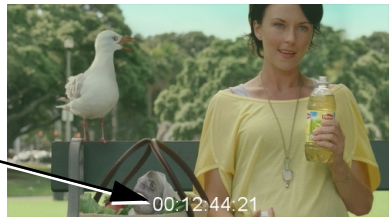
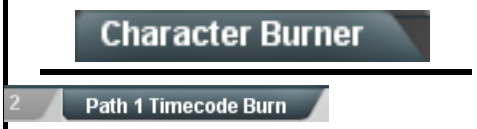
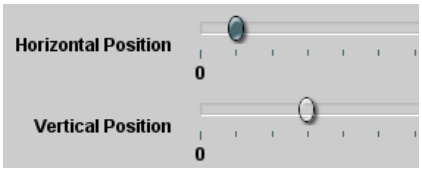
	(continued)
• Timecode Source Selector 	Selects the timecode type to be checked and extracted from program video for burn-in from choices shown. **Note:** Select control must be set for timecode type that is available on program video being processed in order for burn-in to be present.
• Timecode Attributes Controls 	Sets burn-in size/position attributes as follows: • **Character Size** sets character size (in pixels). • **Text Justification** selects from left, right, or center-aligned justification within the text box overlay. • **Character Color** selects text color. • **Character Opacity** sets text opacity from 0% (least opacity) to 100% (full opacity).
• Timecode Background Attributes Controls 	Provides independent controls for setting the color and opacity of the burn-in text and its background. • **Color** drop-down sets background color from multiple choices. • **Opacity** control sets background opacity from 0% (least opacity) to 100% (full opacity).
• Timecode Position Select 	Sets the location of the timecode insertion from choices shown or custom. (When Custom is selected, position is configured using the **Timecode Positioning Controls** described below.) **Example:** Timecode burn-in using **Bottom Center** position  **Example:** Timecode burn-in using **Top Left** position

Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

<table>
<tr><td> 
</td><td>(continued)</td></tr>
<tr><td>• Timecode Positioning Controls
 
</td><td>With Custom selected, sets burn-in position attributes as follows:
• Horizontal Position sets horizontal position (in percentage of offset from left of image area). (Range is 0 thru 100%)
• Vertical Position sets vertical position (in percentage of offset from top of image area, top justified). (Range is 0 thru 100%)
Note: • Horizontal and Vertical Position controls are functional only when Custom Position is selected.
• Character sizing and positioning for a given raster format may not be appropriate for another format (especially if transitioning from HD to SD). Set size and position for a balanced appearance (e.g., do not place text too close to margins or set larger than necessary) that accommodates both HD and SD raster formats if multiple format use is required.</td></tr>
<tr><td>Positioning with H and V controls at zero (origin)
(Size = 3)

Positioning with H and V controls both at 50
(Size = 3)

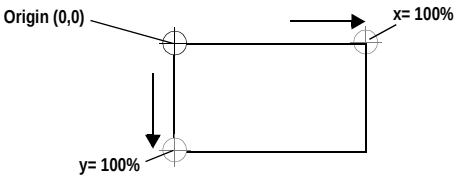
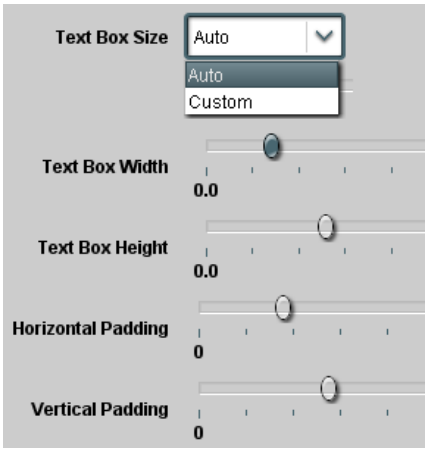
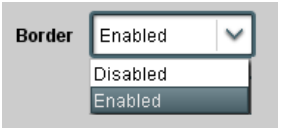
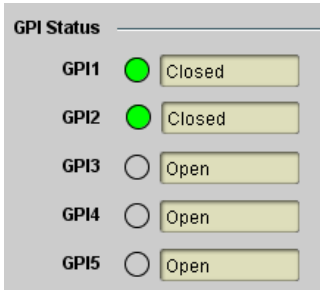
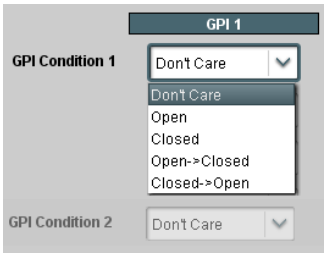
 
</td><td>
</td></tr>
<tr><td>• Text Box Sizing Controls
 
</td><td>Provides controls for setting the size of the burn-in background box.
• Auto allows text box to proportionally size with selected text size.
• Custom allows override of proportional sizing and allows text V and H dimensions to be set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

Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

GPI Setup	Provides controls for defining up to 16 GPI conditions using the five independent GPI inputs (GPI 1 thru GPI 5). These GPI conditions can in turn be used to invoke any of the device control, processing, and/or routing functions.
• GPI Status Display 	Shows the steady-state condition of each of the device's five GPI inputs. (In this example, **GPI 1** and **GPI 2** are showing closed (pulled to ground), while **GPI 3** thru **GPI 5** are open (resting default open state). **Note:** Refer to GPI Connections and Electrical Parameters in Chapter 2, Installation for important parameters and limitations for interfacing with and using the device GPI's.

• GPI Condition Definers

Up to 16 discrete and independent GPI Conditions can be defined using the five available GPI's (**GPI 1** thru **GPI 5**). In the example below, user-defined GPI Condition 1 becomes active when **both** GPI 1 and GPI 2 have closed states.



For each of the five GPI's available for each of the 16 Condition Definer rows, the desired GPI condition(s) that are intended to enable the condition are defined using the drop-down which selects from level and edge-trigger states as shown here.

When a GPI Condition is defined (and the state conditions become true), the GPI Condition(s) can be used by the Event Settings page to invoke automated functions (such as user preset invoke, logo insertion, program video routing and numerous other device functions) as a function of the received GPI states. ("Event Setup Controls" on page 3-23 shows examples of using GPI tied to user-defined events to provide GPI control of typical device functions.)

Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

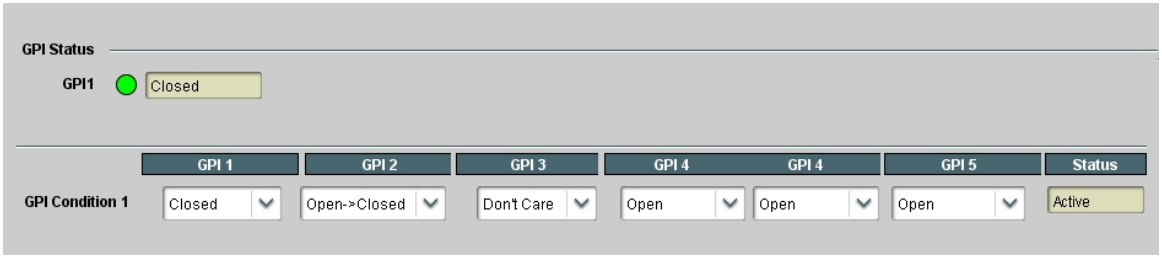
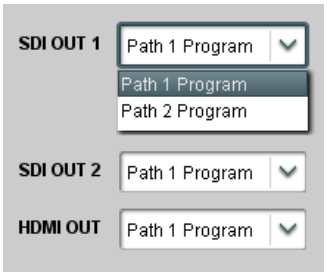
GPI Setup	**(continued)**
In the example below, **GPI Condition 1** only becomes active when **all** conditions specified in the five GPI input selectors are true. Here, GPI 1 being set to detect closed could serve as a pre-launch acknowledge, with edge-triggered GPI 2 serving as the launch. GPI 3 thru GPI 5 settings here explicitly reject any action should any of these inputs be detected as closed. 	
Output Video	Provides crosspoint controls to route Path 1 and Path 2 processed video to SDI outputs and an HDMI output.
• **Path 1/2 Route to Output Select** 	For the two device SDI outputs and the HDMI output, independently routes **Path 1 Program** or **Path 2 Program** video to each output. **Note:** HDMI output is video only; all HDMI audio channels are muted.

Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

Logo	Provides controls for uploading logo/"bug" user graphics and correlating the graphics to user functions that will be called to insert the graphic(s) for various conditions. All uploaded graphic insertions can be correlated to triggers such as GPI or events in conjunction with the Event Setup controls.

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

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

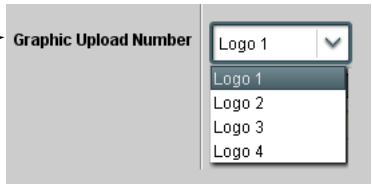
Note: • Your file **must** be a **.png** file with a .png extension. The filename should not contain spaces.
- No scaling is applied or available using the generator tool. (For example, if a 100 x 100 pixel image is uploaded to the tool, the image overlay will also be 100 x 100 pixel regardless of program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

Use the conversion tool as described below.

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

2. Using **Graphic Upload Number** drop-down on **Logo Insertion** tab, select the DashBoard graphic ID where you want the image to be available (i.e., **Logo** or **Trouble Slate** *n* choice).

This drop-down selects under which DashBoard holder number (**Logo 1** thru **Logo 4**) the uploaded graphic will be held and associated with.



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

4. In DashBoard on the card/device page, click **Upload** to upload the image file to the card/device. Follow the prompts to browse to and upload the file. The image is now ready to be used by the card/device.

5. Repeat steps 1 thru 4 for any other logo images to be uploaded to the card/device.

Checking Upload and Test-Positioning Logo Insertion

- **Status** shows if a graphic file associated with the DashBoard graphic name is loaded and ready for use.
  - **Red** indicates graphic for that holder location is not uploaded to device.
  - **Yellow** indicates graphic is loaded, but not enabled for insertion.
  - **Green** indicates graphic is being inserted onto program raster.
- **Logo Enable (Disable/Enable)** master enables or disables insertion for the related logo graphic holder number.allows the selected graphic to be manually test-inserted to assess aesthetics and positioning.
- **Event** selects under which conditions the logo graphic will be inserted.
  - **Always On** allows the selected graphic to be manually test-inserted to assess aesthetics and positioning. With the desired logo uploaded to the device, select Always On and position/check the logo using the H and V position controls.
  - **Use Event Settings** is the normal mode, and ties graphic insertion to automated events (such as GPI) to enable and disable insertion.

Note: Make certain control is set to Disabled after assessing manual insertion. The graphic can then be inserted using automation as described further in this section.

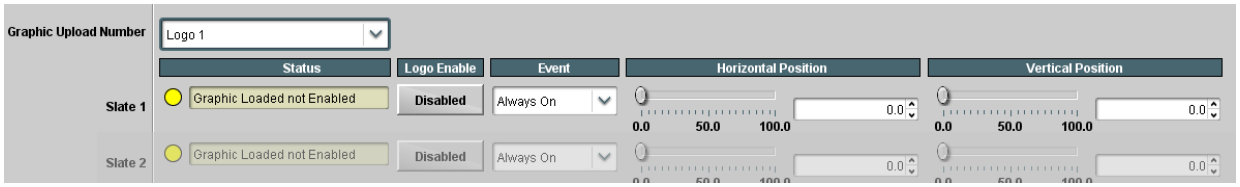


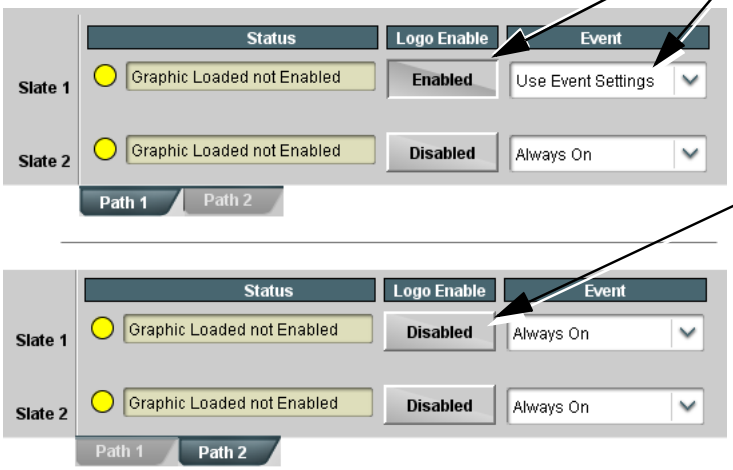
Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

Logo	**(continued)**

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

Path-Specific Settings for Logo Insertion

The Path 1 and Path 2 sub-tabs on the Logo page allow for independent insertion rules for both Path 1 and Path 2 (as shown in the example below).

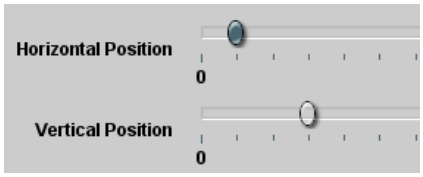


On the **Path 1** sub-tab, Logo 1 (“Slate 1”) here is set to Enable Slate 1, but only enable it per event settings (GPI, etc.)

On the **Path 2** sub-tab, Logo 1 (“Slate 1”) here is set to disabled, thereby never inserting the graphic

Note: Although both sub-tabs show up to four graphic holders, the total is four device-stored graphics which can be used and shared between the two paths.

• Logo Positioning Controls

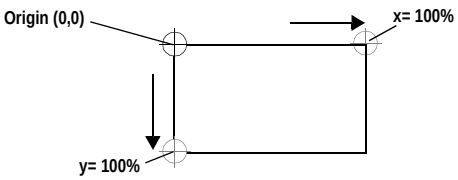


Sets logo burn-in position as follows:

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

Positioning with H and V controls at zero (origin)

Positioning with H and V controls both at 50



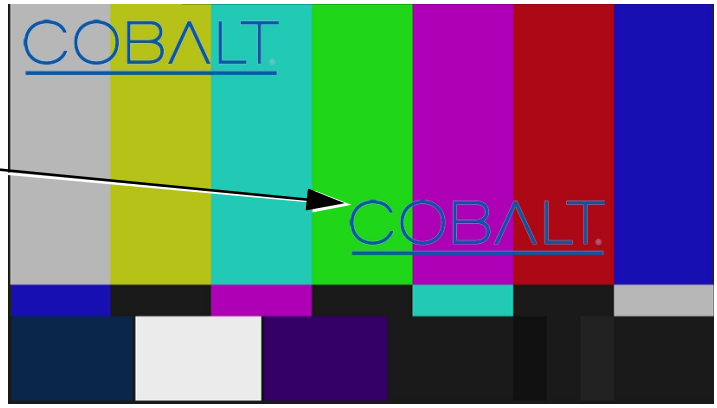


Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

Keyer	Provides key/fill insertion controls and displays insertion status.

Note: • **Keyer** tab has identical independent controls for both Path 1 and Path 2 using the **Path 1 / Path 2** sub-tabs. The two key engines (Keyer 1 and Keyer 2) are available for either path and are independent of any path concerns. Total of two key engines are available for path 1 and path 2.

• Keyer 1 and Keyer 2 have dedicated SDI input pairs (Keyer 1 and Keyer 2 respectively use **KEY/FILL SDI IN 1** and **KEY/FILL SDI IN 2** input pairs on rear panel connections).

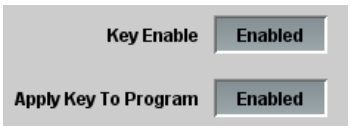
• Key Mode Control

Selects key mode as follows:

• **Alpha Ramp** setting is used when typical key/fill is provided by key/fill generator with separate key and fill outputs.

• **Alpha Threshold** or **Reverse Alpha Threshold** settings are used to provide keying using a combined key/fill signal derived from a simple graphic source.

• Key/Fill Insertion Enable Control



Key Enable control sets up key/fill for insertion. When enabled, key preview is available on Key Preview output.

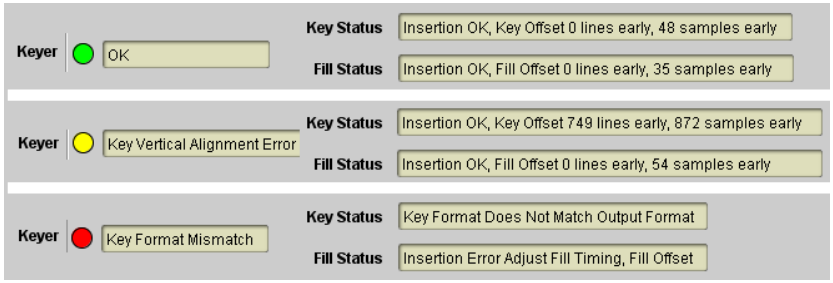
When key preview shows desired results, **Apply Key To Program** can be enabled to apply the key/fill to the program video output.

• Key/Fill Status Displays

Displays keyer timing status as described below.

Note: • Key/fill timing is a function of the respective key and fill signal frame sync card/device(s). Ideal timing is within 0 to 200 samples early of output video timing. Key/fill source timing cannot be controlled on BBG-1023-DSK-LG device.

• Error in key/fill timing will result in loss of keying (however, program video image will not be corrupted).

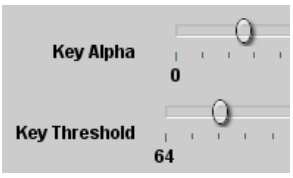


Key/fill insertion OK, within target 0-200 samples early

Key or fill insertion late error (in this example, late key video as shown by "wrap-around" line 749 lines early offset)

Key or fill video missing/mismatched format

• Key Alpha/Threshold Controls



When keying is set to Alpha Threshold or Reverse Alpha Threshold mode sets luma thresholds, when crossed, allow key/fill onto program video image.

Key Alpha setting, when increased, increases the opacity of the key/fill.

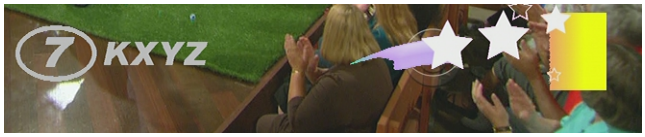
Key Threshold setting, when reduced, more readily allows the key/fill input to assert itself over more variations of program video luma levels.

Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

Keyer	(continued)

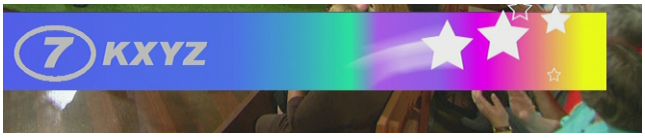
Alpha Threshold keying allows cost-effective luminance keying from low-cost generic file-based graphic sources. With the graphic source applied to both the card **Key** and **Fill** inputs, the card **Key Alpha** and **Key Threshold** controls can be set to easily optimize the key/fill as shown below.

Key Threshold setting, when reduced, more readily allows the key/fill input to assert itself over more variations of program video luma levels. In the example to the right, progressively reducing the threshold setting allows more of the key/fill to assert iteslf over the program video.



Key Alpha setting, when increased, increases the opacity of the key/fill. In the example to the right, progressively increasing the alpha setting increases the key/fill opacity.

When both settings are optimized, the key/fill appears consistent in opacity and free from edge distortions or graphic bleed lines appearing in the image.



Alpha Threshold mode setting is suited for graphic sources using black backgrounds. **Reverse Alpha Threshold** mode setting is suited for graphic sources using white backgrounds.

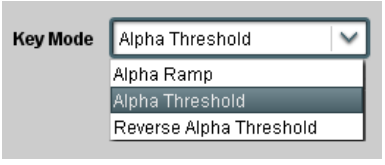


Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

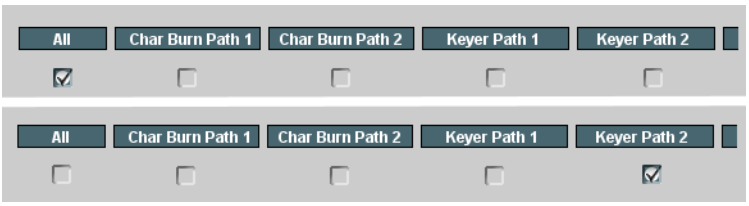
Presets

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

• Preset Layer Select

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

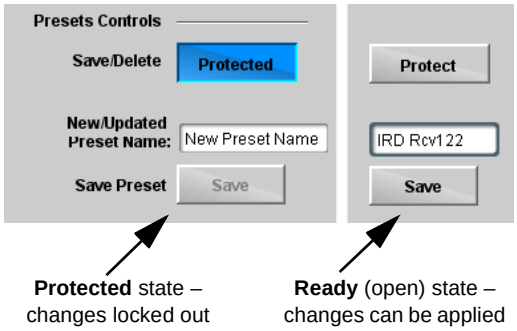
Default **All** setting will "look" at all device settings, and save and invoke **all** settings when the preset is invoked (loaded).



Selecting a layer (in this example, "Keyer Path 2") will set the preset to **only** "look at" and "touch" keyer settings for path 2 and save these settings under the preset. When the preset is invoked (loaded), **only** the Keyer Path 2 layer is "touched".

Example: Since path 2 keyer settings can be considered independent of other settings, if path 2 keyer settings needed to be saved without touching settings for logo insertion, selecting **Keyer Path 2** here limits preset-invoked changes to **only** the Keyer Path 2 layer, "telling" the preset save/load to not concern itself with other aspects such as logo insertion settings. In this manner, when the layered preset is invoked any unrelated "custom" settings in effect will remain untouched.

• Preset Enter/Save/Delete



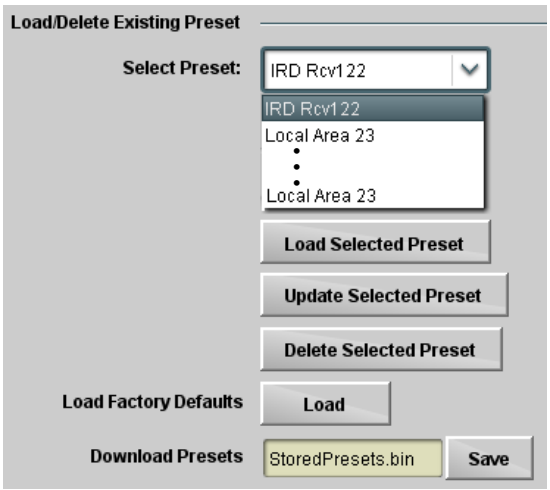
Protected state – changes locked out

Ready (open) state – changes can be applied

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

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

• Preset Save/Load Controls



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

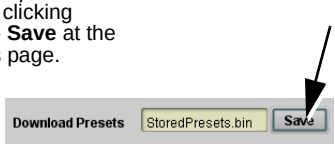
Note: Load Factory Defaults functions with no masking. The Preset Layer Select controls have no effect on this control and will reset **all** layers to factory default.

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

Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

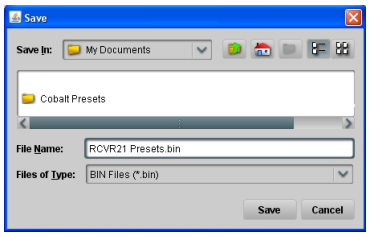
Presets	(continued)

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



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

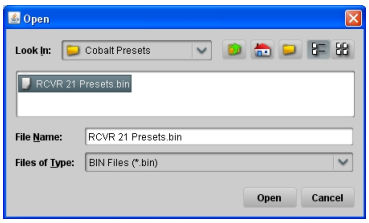
The file can then be renamed if desired (*RCVR21 Presets* in this example) before committing the save.



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

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

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



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

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

Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

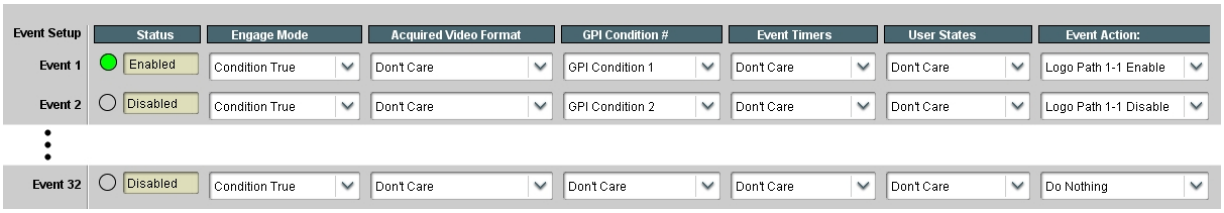
Provides event-based loading allowing a defined action to be automatically engaged upon various received signal status. Actions can be “canned” control commands or user-defined by going to a user preset.

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

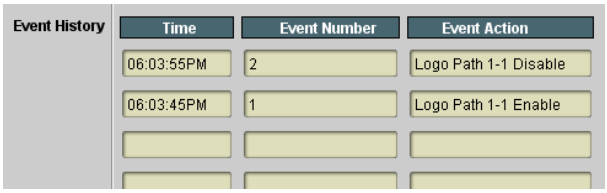
Event triggers allow a variety of event screening criteria, and in turn provide an Event Action “go to” in response to the detected event(s). For each screened criteria, categories can be set as “Don’t Care” or set to specific criteria to broaden or concentrate on various areas of concern.

- The **Event-Based Loading** button serves as a master enable/disable for the function.
- Go-to **Event Actions** can be user-defined presets, “canned” (hard-coded) selections (such as insertions), and automated E-mail alert to a respondent (see Email Alerts (p. 3-26) for setting up e-mail alerts).
- Each Event (**Event 1** thru **Event 32**) can be set to screen for any or several Definer criteria as shown in the example below. Up to 32 separate events can be defined.
- Event 1 thru Event 32 are arranged with Event 1 having the highest priority, descending down to Event 32. Where multiple event screening is enabled, lower-priority events are serviced first, with the highest-priority event being the final event serviced and last action taken as well as last item logged in the Event History (see below). This helps ensure that a lower-priority event does not mask detection of higher-priority event(s).
- The **Status** indicator and message shows the activation status of each Event. Green indicator means event is currently engaged.

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



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



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

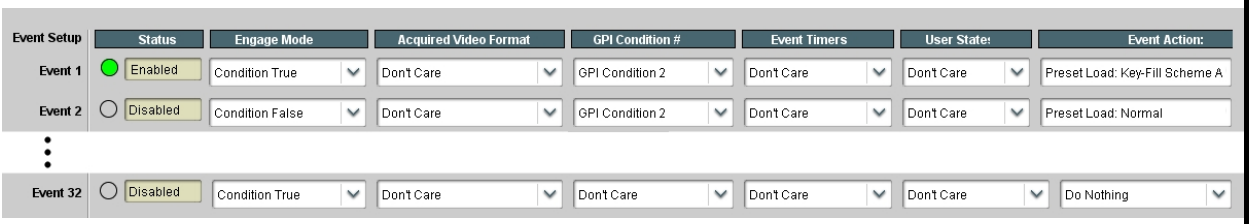
In the example here, log shows Event 2 as the most recent event (which consisted of an action/event disabling logo insertion on path 1).

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

Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

(continued)

In the example here for Event 1 and Event 2, user-defined GPI Condition #2 is used in turn to invoke user preset “Key-Fill Scheme A” (set using the Keyer page and then as a preset on the Presets page). The **Engage Mode** true or false settings can be used, in conjunction with the selected GPI condition, to go to invoke preset Key-Fill Scheme A” on true, and disable the called preset and revert to normal (preset: “Normal”) upon a false.



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

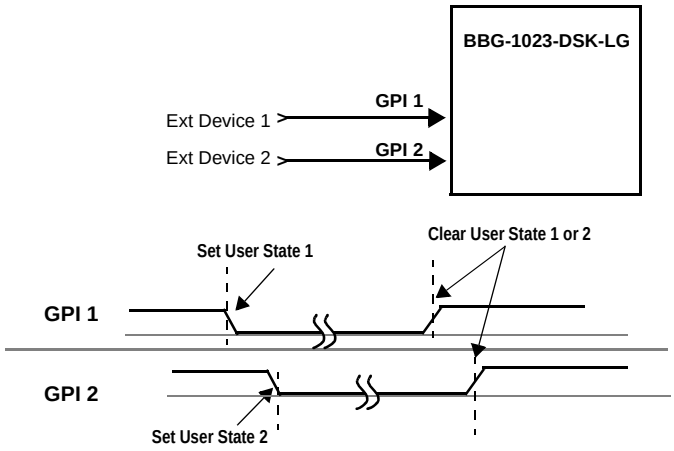
- If a desired user preset does not appear in the Event Action drop-down, press the DashBoard **Refresh** button at the bottom of the page to update the list in the drop-down.
- Loss of true conditions does not disengage an event-based triggering. A new set of conditions (or a defined false of a condition) must be defined and then occur to transition from one event-based trigger to another.
- Time required to engage an event-based trigger depends upon complexity of the called preset. (For example, a preset that invokes a key/fill setup may take longer to engage than a simple logo insertion.)
- 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 an action is expected to “see” a GPI condition to invoke the action, make certain a GPI condition is defined that can cancel or disable the preceding action when desired.
- Event Actions defined using user presets must be used with care to prevent conditions that could cause looping or the removal or “override” of desired expected settings. When using presets, the Preset Layer selection should be used such that only required aspects are touched.
- Where multiple event screening is set up, the event you consider to be the highest priority should be set as higher priority than lesser events.

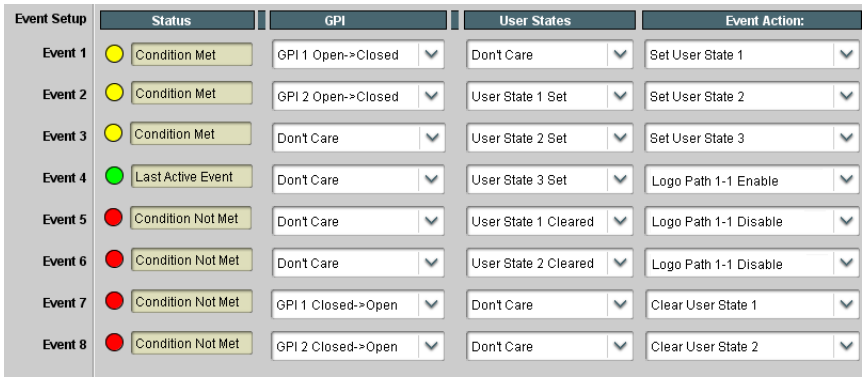
Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

(continued)

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

In the example here, two independent external devices are used to request a logo insertion. 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 devices are independent and cannot be relied upon to provide coinciding triggers, a chain of user state definers are used here to engage a logo insertion when both states from both external devices are true in the order of GPI 1 first and then GPI 2 second for this example.





GPI 1 falling-edge sets user state 1

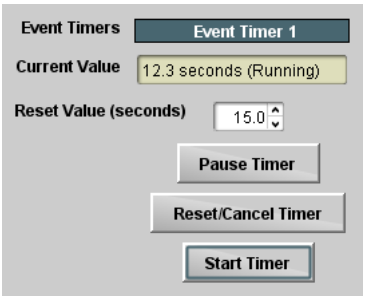
GPI 2 falling-edge sets user state 2

User state 2 (which requires user state 1 being true first) sets state 3, which then invokes event action Logo Path 1-1 Enable. Logo is now inserted into video.

When either GPI 1 or GPI 2 has a rising-edge trigger, user states 1 or 2 are cleared, thereby clearing user state 3. Either state change calls an action Logo Path 1-1 Disable, disabling the logo insertion and reverting to normal operation.

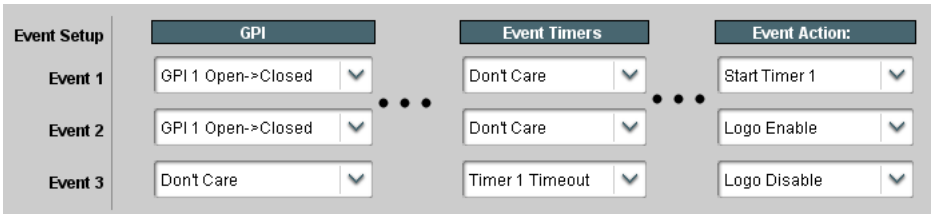
Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

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



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

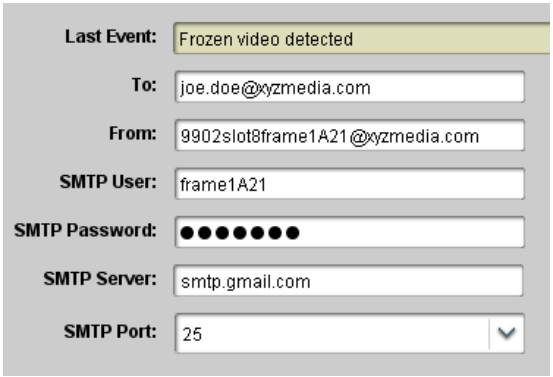
in the example here, **Event Timer 1** is used to set a logo insertion disable after a specific amount of elapsed time. A GPI inserts the logo, along with a time started at that time. Upon the timer timeout, a separate action sets logo insertion to Disabled.



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

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

Note: Network 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.



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

Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

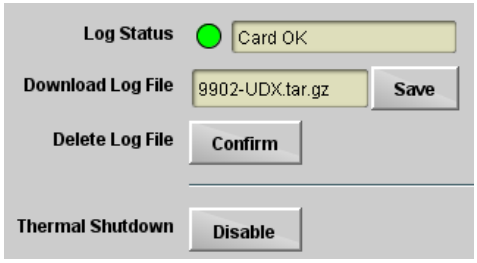
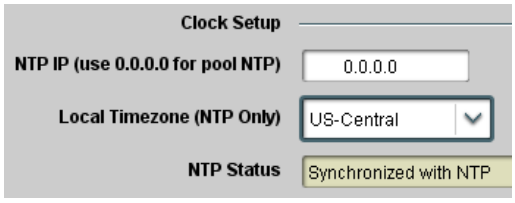
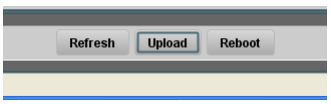
Admin	Provides a global operating status and allows a log download for factory engineering support. Also provides controls for selecting and loading device firmware upgrade files.
• **Log Status and Download Controls** 	• **Log Status** indicates overall device internal operating status. • **Download Log File** allows a device operational log file to be saved to a host computer. This log file can be useful in case of a device error or in the case of an operational error or condition. The file can be submitted to Cobalt engineering for further analysis. • **Delete Log File** deletes the currently displayed log file. A second confirmation dialog is displayed to back out of the delete if desired. • **Thermal Shutdown** enable/disable allows the built-in thermal failover to be defeated. (Thermal shutdown is enabled by default). **CAUTION** **The BBG-1023-DSK-LG 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.**
• **NTP Clock Setup** 	Allows device NTP clock IP source and localization. This is the clock/time device will use for logs and other recorded actions. • **NTP IP** sets the IP address where NTP is to be obtained. • **Local Timezone** sets the recorded time to the localized time. • **NTP Status** shows if time is synced with NTP or if an error exists.

Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

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

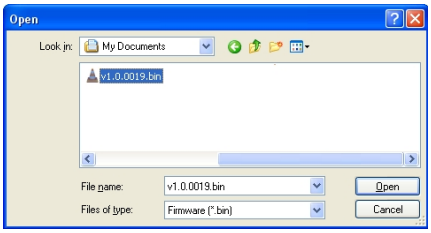
Note: The page/tab here allows managing multiple firmware versions saved on the device. New upgrade firmware from our web site can always be directly uploaded without using this page. Instructions for firmware downloading to your computer and uploading can be found at the **Support>Firmware Downloads**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

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



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

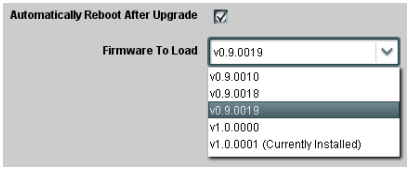
3. Select the desired file and click **Open** to upload the file to the device.



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

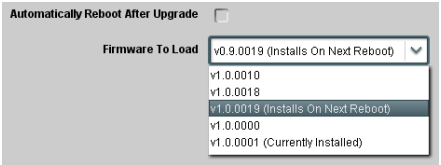
1. Click **Firmware To Load** and select the desired upgrade file to be loaded (in this example, "v1.0.0019").

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



• **Deferred firmware upload.** With **Automatically Reboot After Upgrade** unchecked, firmware upgrade loading is held off until the 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).

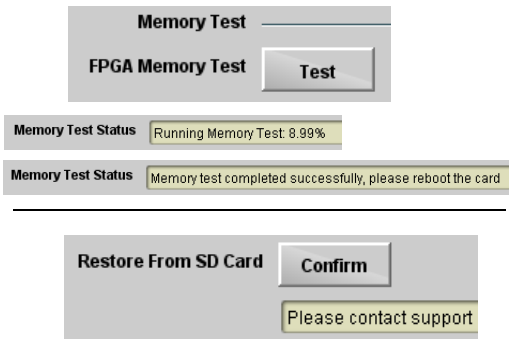
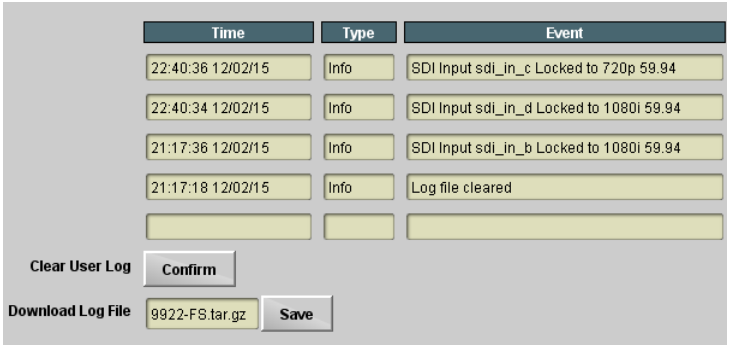
1. Click **Firmware To Load** and select the desired upgrade file to be loaded (in this example, "v1.0.0019"). Note now how the display shows "Installs on Next Reboot".



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

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

Table 3-1 BBG-1023-DSK-LG Function Menu List — continued

Admin	**(continued)**
• **Card Check and Restore Utilities** 	**Memory Test** allows all cells of the device FPGA memory to be tested. This control should **only** be activated under direction of product support. Exercising the memory test is **not** part of normal device maintenance. **Restore from SD Card** allows device rendered inoperable to be restored using an SD memory card fitted to the device internal SD slot. Product support must be contacted prior to performing this operation. Use of any SD card not supplied by support can corrupt the device.
User Log	Automatically maintains a log of user actions and input lock status. Log file can be downloaded using download utility.
User Log shows input lock and other user conditions (with most recent event at top of list). **Clear User Log** clears all entries. **Download Log File** opens a browser allowing the log file to be saved on the host machine.	

Uploading Firmware Using Web Interface and GUI

Firmware (such as upgrades, option keys, and presets .bin files) can be uploaded to BBG-1023-DSK-LG 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.

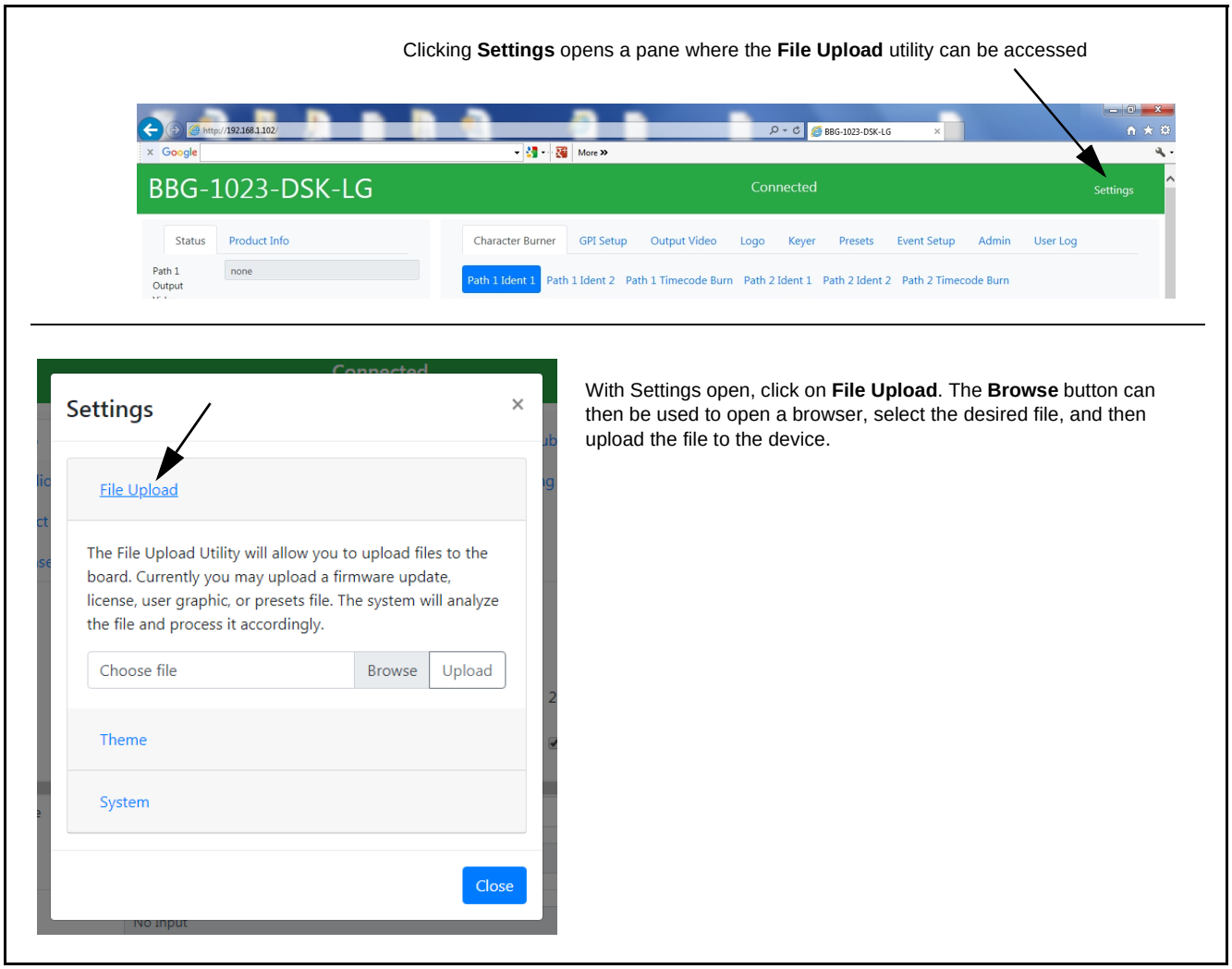


Figure 3-7 Uploads Using Web Interface/GUI

Front Panel User Menus

All of the mode and parametric controls available using the web UI (as described in BBG-1023-DSK-LG Function Menu List and Descriptions) are available using the front panel display and arrow navigating buttons.

The front panel menus offers a true standalone means to configure the BBG-1023 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 or DashBoard 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 have additional nested submenus (denoted by ⁎). These multiple-level submenus are not listed here; refer to the referenced page number for more information.

Troubleshooting

This section provides general troubleshooting information and specific symptom/corrective action for the BBG-1023-DSK-LG and its remote control interface. The BBG-1023-DSK-LG 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-1023-DSK-LG itself and its remote control provide error and failure indications. Depending on how the BBG-1023-DSK-LG 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.

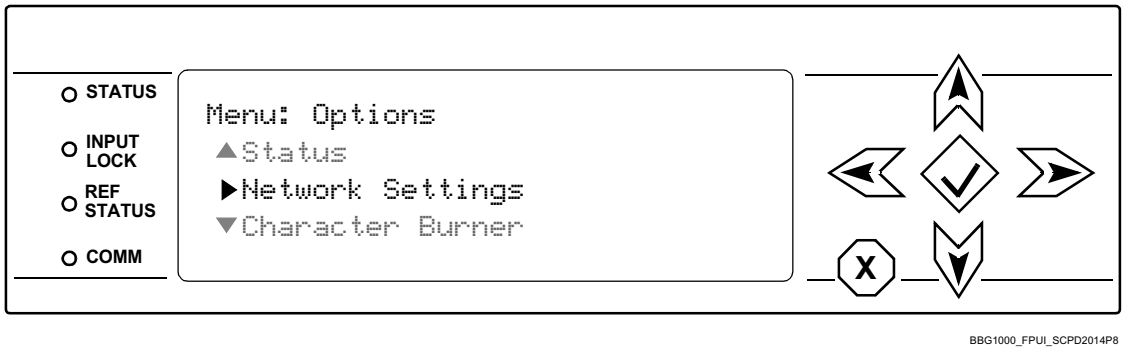
The various BBG-1023-DSK-LG device and remote control error and failure indicators are individually described below.

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. 3-34)
- BBG-1023-DSK-LG Processing Error Troubleshooting (p. 3-35)

BBG-1023-DSK-LG Front Panel Status/Error Indicators and Display

Figure 3-8 shows and describes the BBG-1023-DSK-LG 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.



Item	Function
Alphanumeric Display	Shows device statuses
STATUS LED	Illuminates GREEN indicating BBG-1023-DSK-LG has successfully powered-up and passed self-tests.
INPUT LOCK LED	Illuminates GREEN indicating signal presence for currently-selected input video path. Illuminates ORANGE if input video is lost.
REF STATUS LED	Illuminates GREEN indicating BBG-1023-DSK-LG is receiving valid reference when set up for framesync operation. Illuminates ORANGE if reference is lost or incompatible with input video.
COMM LED	Illuminates GREEN when device is communicating with network connection. Illuminates ORANGE if connection is lost.
Note: The LEDs listed above are always illuminated under normal conditions. An LED that is not lit indicates an error with the device.	

Figure 3-8 BBG-1023-DSK-LG 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 3-2 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 3-2 Basic Troubleshooting Checks

Item	Checks

Verify power presence and characteristics	• On the BBG-1023-DSK-LG, in all cases when power is being properly supplied all indicators should be illuminated. Any device showing no illuminated indicators should be cause for concern.
	• Check the Power Consumed indication for the BBG-1023-DSK-LG. This can be observed using the Status front-panel or web UI pane.
	  • If display shows **no** power being consumed, either the power supply, connections, or the BBG-1023-DSK-LG itself is defective.
	  • If display shows **excessive** power being consumed (see Technical Specifications (p. 1-15) in Chapter 1, “Introduction”), the BBG-1023-DSK-LG may be defective.

Check Cable connection secureness and connecting points	Make certain all cable connections are fully secure (including coaxial cable attachment to cable ferrules on BNC connectors). Also, make certain all connecting points are as intended. Make certain the selected connecting points correlate to the intended device inputs and/or outputs. Cabling mistakes are especially easy to make when working with large I/O modules.
Check status indicators and displays	On BBG-1023-DSK-LG front panel and web interface indicators, red indications signify an error condition. If a status indicator signifies an error, proceed to the following tables in this section for further action.
Troubleshoot by substitution	All devices can be hot-swapped, replacing a suspect device with a known-good item.

BBG-1023-DSK-LG Processing Error Troubleshooting

Table 3-3 provides BBG-1023-DSK-LG processing troubleshooting information. If the BBG-1023-DSK-LG exhibits any of the symptoms listed in Table 3-3, follow the troubleshooting instructions provided.

In the majority of cases, most errors are caused by simple errors where the BBG-1023-DSK-LG is not appropriately set for the type of signal being received by the device.

Table 3-3 Troubleshooting Processing Errors by Symptom

Symptom	Error/Condition	Corrective Action
BBG-1023 shows **Unlocked** message in BBG-1023-DSK-LG Info pane.	No video input present	Make certain intended video source is connected to appropriate BBG-1023-DSK-LG video input. Make certain coaxial cable connections are OK.
Selected upgrade firmware will not upload	Automatic reboot after upgrade turned off	Card **Presets** > **Automatically Reboot After Upgrade** box unchecked. Either reboot the card 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 loading (**Event Setup** tabs) should be set to **Disabled** if this function is not to be used. Read and understand this control description before using these controls to make sure engagement for all expected conditions is considered. See Event Setup Controls (p. 3-23) for more information.
Device will not retain user settings, or setting changes or presets spontaneously invoke.	**Event-Based Loading** control on **Event Setup** tab inadvertently set to trigger on event	If event-based loading is not to be used, make certain **Event-based Loading** is disabled. See Event Setup Controls (p. 3-23) for more information.
Automated logo graphic insertion does not work	• Insertion **Enable** control not enabled in DashBoard	• Default insertion controls set insertion to disabled. Logo must be set to Enabled.
	• Event triggered **Use Event Settings** not properly set up for expected insertion conditions	• Check event setup settings and log on **Events Setup** DashBoard tab to make sure setting are expected to trigger on the desired condition. If setup is correct, you should see an entry in the log corresponding to the event occurring.
	• Graphic for desired insertion not uploaded to device	• The Status field on the **Logo** tab will show “Graphic Loaded” where a file is indeed loaded and correlated to the insertion item (Slate 1 thru Slate 4). If “No Graphic Loaded” appears, then insertion will not be performed until the graphic is loaded to the device. See Uploading Your Logo Graphic Images to Card (p. 3-17) for more information.

Table 3-3 Troubleshooting Processing Errors by Symptom — continued

Symptom	Error/Condition	Corrective Action
Log indicates insertion performed, but insertion is not visible in output raster	Insertion positioned too low or too high in raster for format being carried	On the insertion positioning controls, if the Vertical Position control is set too low or high, the graphic insertion may not be visible in the active image area.
Closed captioning on SD output raster shows errors or visible corruption during graphic insertion	Insertion vertical position impinging on line 21 closed captioning space	For SD usage, burn-ins positioned near the top of the active image will impinge on and corrupt line 21 closed-captioning waveform. Make certain burn-in is not positioned in this area. (Position control set greater than 1.0 avoids this issue.)
Key/fill status shows unexpected results and drifting, ambiguous status delay offsets values on **Keyer** page **Key Status** and/or **Fill Status** displays	Program, key, and/or fill sources not ref locked to same source	The BBG-1023-DSK-LG is not equipped with ref lock or frame sync for its program or key/fill paths. Ref lock (using a synchronized ref source) must be present on upstream program, key and fill sources.
GPI Conditions do not engage as expected	All five GPI inputs for a given condition not considered and set as needed	Each GPI Condition definer row considers **all five** GPI inputs. If certain **GPI 1** thru **GPI 5** inputs are not to be used, these GPIs must be set to **Don't Care**.

In Case of Problems

Recovering Device From SD Memory Card

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

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

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

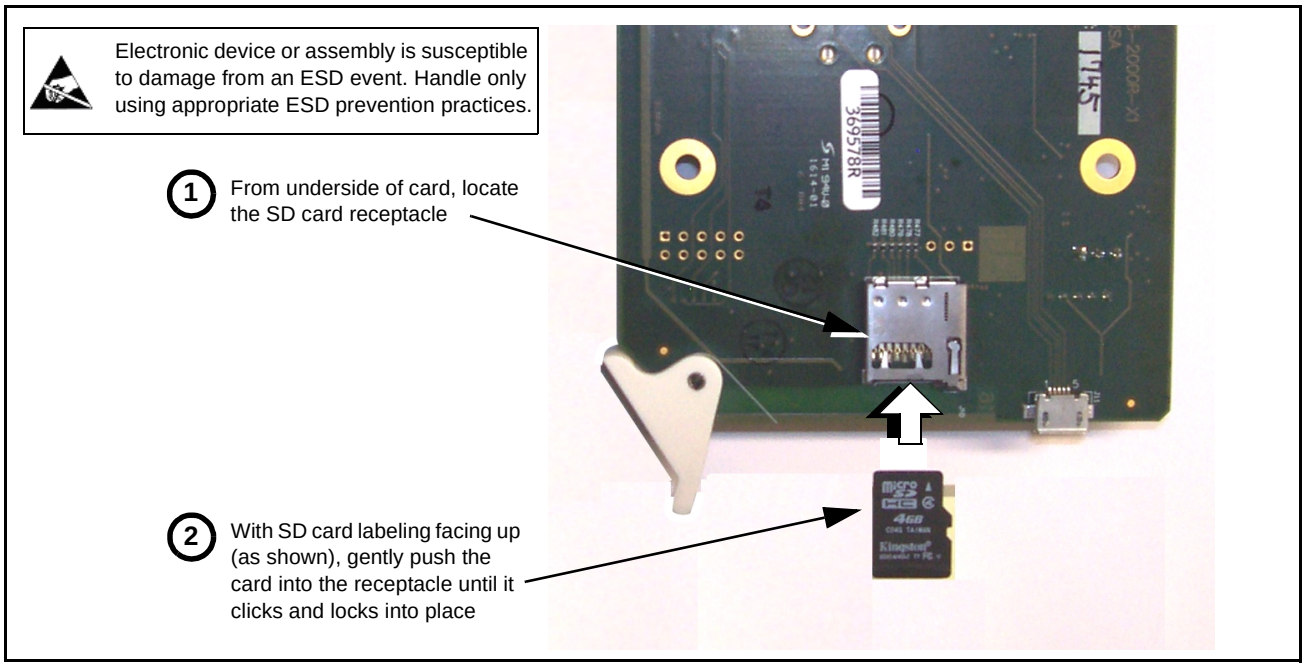


Figure 3-9 SD Card Installation

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

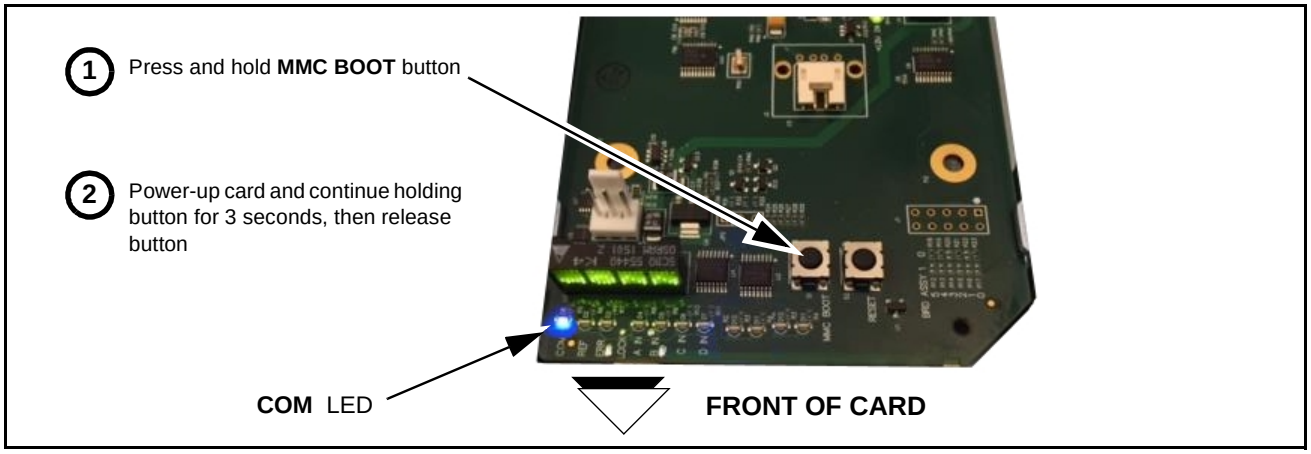


Figure 3-10 MMC Boot Button

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 card will be using its most recently installed firmware.
7. Card/device can now be used as normal. On BBG-1000 Series unit, re-install top cover.

Contact and Return Authorization

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

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

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

See Contact Cobalt Digital Inc. (p. 1-12) in Chapter 1, "Introduction" for contact information.

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