BBG-1070-QS

3G/HD/SD-SDI/CVBS Standalone Expandable Multiviewer
with Advanced On-Screen Graphics

Product Manual

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BBG-1070QS-OM (V1.11)

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Congratulations on choosing the Cobalt® BBG-1070-QS 3G/HD/SD-SDI/CVBS Standalone Expandable Multiviewer with Advanced On-Screen Graphics. The BBG-1070-QS 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-1070-QS, please contact us at the contact information on the front cover.

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Table of Contents

Chapter 1 Introduction 1-1

Overview 1-1
Cobalt Reference Guides 1-1
Manual Conventions 1-2
Warnings, Cautions, and Notes 1-2
Labeling Symbol Definitions 1-3
Safety and Regulatory Summary 1-3
Warnings 1-3
Cautions 1-3
EMC Compliance Per Market 1-3
BBG-1070-QS Functional Description 1-4
BBG-1070-QS Input/Output Formats 1-4
Video Processing Description 1-4
Audio Processor Description 1-8
Cascading (Multi-Device) BBG-1070-QS Operation and Setup Overview ... 1-8
User Control Interface 1-11
Technical Specifications 1-11
Warranty and Service Information 1-13
Cobalt Digital Inc. Limited Warranty 1-13
Contact Cobalt Digital Inc. 1-14

Chapter 2 Installation 2-1

Overview 2-1
Installing the BBG-1070-QS 2-1
Installing Using BBG-1000-TRAY Optional Mounting Tray 2-1
BBG-1070-QS Unit Dimensions 2-2
Rear Panel Connections 2-2

Chapter 3 Setup/Operating Instructions 3-1

Overview 3-1
BBG-1070-QS Front Panel Display and Menu-Accessed Control 3-1
Connecting BBG-1070-QS To Your Network 3-3
Finding a BBG-1070-QS Device in DashBoard 3-4
Control and Display Descriptions 3-5
Function Submenu/Parameter Submenu Overview 3-5
Web User Interface 3-6
Display Theme 3-7
Checking BBG-1070-QS Device Information 3-8

BBG-1070-QS Function Menu List and Descriptions 3-9
Input Routing 3-10
PIP Clone Global Controls 3-13
PIP Layout Controls 3-14
PIP ARC/Borders Controls 3-19
Tally Lamp Insertion Controls 3-21
UMD/Identification Text Insertion Controls 3-23
Audio Meter Overlay Controls 3-31
Reticules Controls 3-35
Output Format Controls 3-38
Output Audio Routing/Controls 3-40
Cascade Config Setup Controls 3-41
Protocols (Router Integration) Controls 3-46
GPI Setup Controls 3-48
Event Actions Setup Controls 3-49
Output Preview 3-54
User Graphic Overlay (Logo) Insertion Controls 3-55
Clock (Wall-Clock Time/LTC) Controls 3-56
Presets 3-57
Admin (Log Status/Firmware Update) 3-61
User Log 3-62
Uploading Firmware Using Web Interface and GUI 3-63
Front Panel User Menus 3-64
Troubleshooting 3-64
Error and Failure Indicator Overview 3-64
Basic Troubleshooting Checks 3-66
BBG-1070-QS Processing Error Troubleshooting 3-66
In Case of Problems 3-69

Chapter 1

Introduction

Overview

This manual provides installation and operating instructions for the BBG-1070-QS 3G/HD/SD-SDI/CVBS Standalone Expandable Multiviewer with Advanced On-Screen Graphics unit (also referred to herein as the BBG-1070-QS).

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-1070-QS.
- **Chapter 2, "Installation"** – Provides instructions for installing the BBG-1070-QS and setting up its network access.
- **Chapter 3, "Setup/Operating Instructions"** – Provides overviews of operating controls and instructions for using the BBG-1070-QS.

This chapter contains the following information:

- **Cobalt Reference Guides (p. 1-1)**
- **Manual Conventions (p. 1-2)**
- **Safety and Regulatory Summary (p. 1-3)**
- **BBG-1070-QS Functional Description (p. 1-4)**
- **Technical Specifications (p. 1-11)**
- **Warranty and Service Information (p. 1-13)**
- **Contact Cobalt Digital Inc. (p. 1-14)**

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-1070-QS itself. Examples are provided below.

- Device display messages are shown like this:

  BBG-1070-QS

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

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

- **BBG-1070-QS** refers to the BBG-1070-QS 3G/HD/SD-SDI/CVBS Standalone Expandable Multiviewer with Advanced On-Screen 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-1070-QS and other cards or units operate.
- Functions and/or features that are available only as an option are denoted in this manual like this:

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-1070-QS 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-1070-QS Functional Description

Figure 1-1 shows a functional block diagram of the BBG-1070-QS. The BBG-1070-QS includes input processing functions to accommodate SDI and CVBS analog inputs, a validity check function to provide indication of input defects, timecode and audio data handling and routing control, multi-split ARC/scaling functions, a timing alignment function to synchronize the inputs to house reference, up to 5:1 Picture-in-Picture (PiP) video combining, and burn-in attributes and control of borders, UMD display text, audio meters, and other accessory displays. The output is available as a 3G/HD/SD-SDI output or HDMI/DVI. The output raster format and aspect ratio is user-configurable.

BBG-1070-QS Input/Output Formats

The BBG-1070-QS provides the following inputs and outputs:

- **Inputs:**
  - **SDI/CVBS IN A** thru **SDI/CVBS IN E** – five coaxial video inputs (auto-detecting 3G/HD/SD-SDI or CVBS analog video)
- **Outputs:**
  - **3G/HD/SD-SDI OUT** – 3G/HD/SD-SDI multi-image video output
  - **HDMI/DVI OUT** – Multi-image HDMI/DVI out with selectable audio embedding (suitable for direct connection to monitor panels)

Video Processing Description

The BBG-1070-QS features input select and validity check functions, timing alignment, and PiP ARC/scaling functions as described below.

Input Video Select Function

Auto-detect per PiP inputs independently set each of the device video inputs as 3G/HD/SD-SDI or CVBS SD analog video. Either mode preserves waveform and packet-based ancillary data for extraction and usage later in the processing chain. A CVBS input is automatically detected by the device input, with the CVBS ADC converter automatically engaged in these cases.

Timecode Processor

This function provides for extraction of timecode data from any of the five per-PiP input video sources, and in turn allows timecode strings to be burned into the respective PiP images. The function can monitor any of the device video inputs for supported timecode formats such as HD ATC_LTC or ATC_VITC, and ATC_VITC or VITC waveform for SD SDI or CVBS inputs.

ARC Processor

This function provides separate ARC controls for each PiP input. The separate controls can re-aspect SD to match the aspecting used for HD inputs, and vice versa. Custom aspecting is also available for both HD and SD formats.

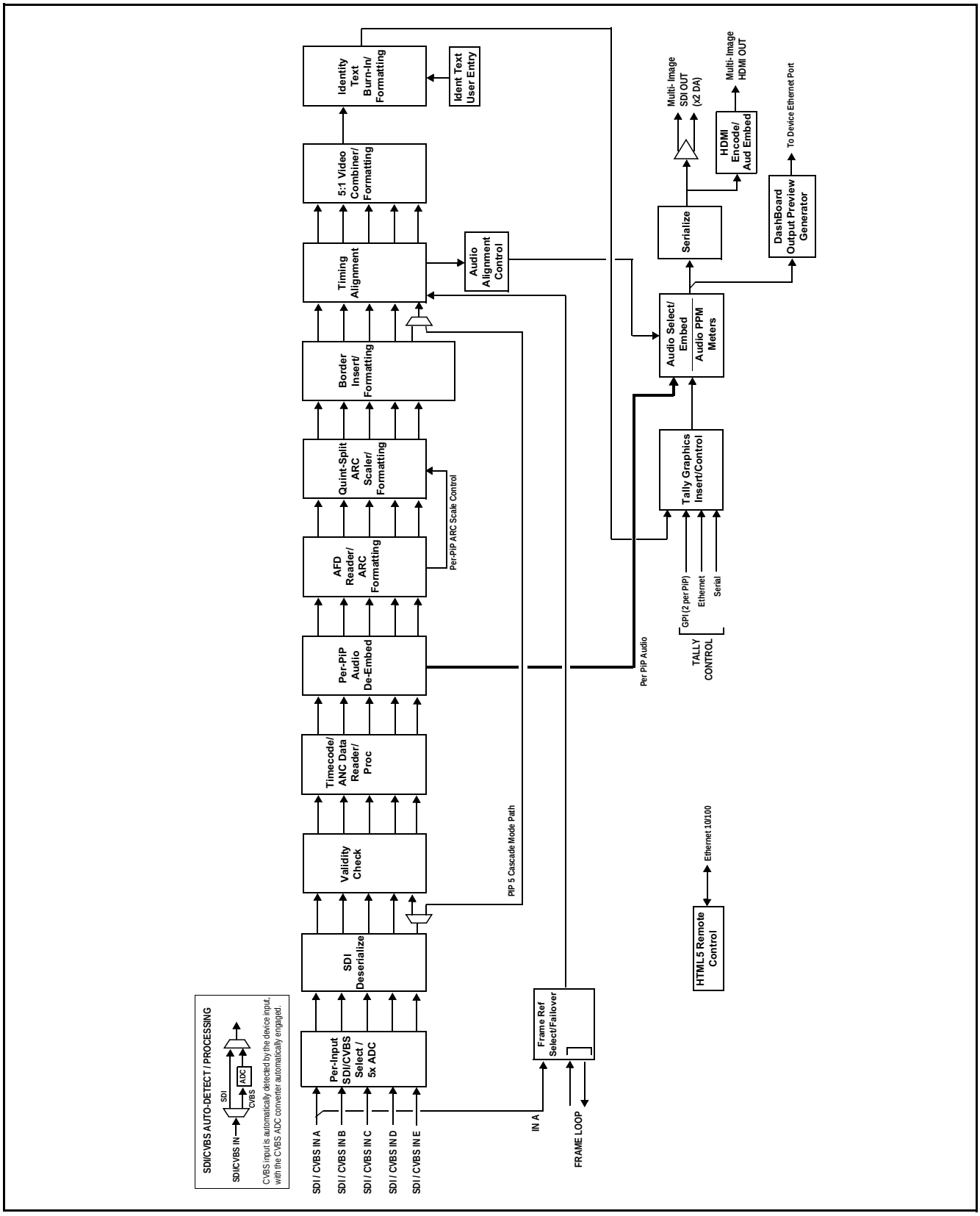


Figure 1-1 BBG-1070-QS Functional Block Diagram

Quint-Split ARC Scaler/Formatting Function

This function provides conversion of each PiP input to match a common user-selected format, resulting in images that are format-matched and suitable for combining into a single PiP image. When the PiP images are sized by this function, the borders and other accessory attributes are now integrated into each PiP image. In addition to full user control of PiP image H/V sizing, accessory attributes such as border size, weight, and color can be user configured.

Quint Timing Alignment Function

This function provides for frame alignment control of the five PiP inputs using either the external **FRAME LOOP** reference signal, or a selected input video as a frame reference. As such, BBG-1070-QS can accommodate asynchronous program video inputs.

This function also allows frame offset delay to be added between the output video and the frame sync reference.

Frame sync can select from external frame reference source, input video, or free-run (internal) timing. Selectable failover allows alternate reference selection should the initial reference source become unavailable or invalid.

5:1 Video Combiner/Formatting Function

This function combines the five video images into the user-configured positions within the overall image. At this point, all PiP images are of the same raster format and fully synchronous. User positioning controls provide the H and V offsets that position the images as desired by the operator using the GUI controls.

Identity Text Burn-In/Formatting Function

This function provides user controls for entering UMD and user ident text that is burned into each PiP image. Controls allow full control of positioning, sizing, and color/background/opacity attributes. Burn-in text can be user entry text, video format of the corresponding PiP, wall-time clock, closed-captioning/XDS of the associated PiP input, or external text sourced via IP from an automation system.

Tally Graphics Insert/Control

This function accommodates tally inputs (received as GPI, serial, or network commands) and allows configuring the commands to provide tally indications for each PiP image. All visual attributed are configurable, including “lamp” color, size, and positioning.

Up to five GPI inputs are available for selecting per-PiP tally lamp insertions and border attributes such as colors. The combined states of the GPI inputs can form “virtual” GPIs which can be used for up to 16 discrete GPI-defined actions. Tally activation can also be controlled via IP from an automation system/router. UMD text can be inserted using local user text entry or integrated with router automation to receive text from the automation system.

Output Preview via Network Connection

A DashBoard Output Preview function provides the display of regularly-sampled screen captures in the device DashBoard remote control page. This provides remote-access program video content/presence and multiviewer layout confidence monitoring via the device's DashBoard display without needing collocation with the BBG-1070-QS or its input or output video signals.

When the device is acquiring frame captures (either 5-second periodic-updated continuous images or single frame (user selectable)), the area on the bottom of the DashBoard page displays the multiviewer image of the input video PiPs. DashBoard acquires program video frame captures using an external network connection from the BBG-1070-QS Ethernet port to the network/computer hosting the device's DashBoard connection. (When preview is requested, DashBoard queries the device address for the image, with the image transferred via the device rear panel Ethernet connection).

Note: This function operates only if the device is set to provide a **progressive** video output (e.g., 720p, 1080p, etc.).

User Graphic Insertion

(See Figure 1-2.) A User Graphic insertion function provides for graphic insertion onto the SDI processed output raster of the host card/device. The allows for uploading your .png image graphic file to the card/device memory. to the host card/device. (png files are converted to a special format using a web tool before uploading; this is described in the setup/operating instructions "User Graphic Overlay (Logo) Insertion Controls" in Chapter 3 – Setup Instructions.)

When the image file(s) is uploaded to the card/device, its insertion can be enabled via DashBoard Event Setup controls that enable the graphic insertion only under certain conditions as desired. DashBoard controls allow for positioning the image within the active video.

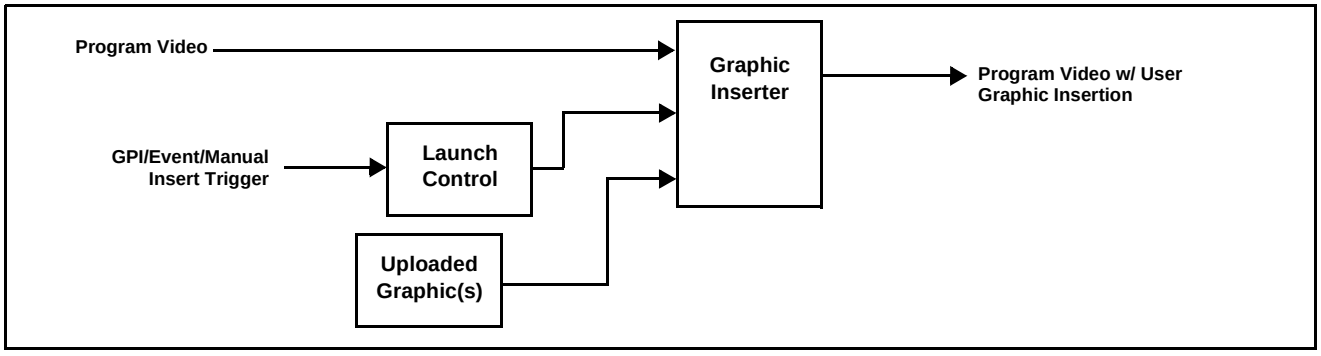


Figure 1-2 Graphic Insertion Simplified Functional Diagram

Audio Processor Description

Audio Select/Embed

The audio processor operates as an internal audio router for selecting PiP-input embedded channels 1-16 as channels (as a four-group package) to be embedded into the combined PiP SDI and HDMI video outputs. The audio processor function operates with the timing alignment function to align audio with the selected reference.

Note:
- Output audio always corresponds to a single particular selectable PiP input. Various output embedded channels cannot be sourced from a mix of various PiP input embedded channels.
- To maintain conformance with CEA-861D HDMI audio channel line-up specifications and industry standard SDI convention, the HDMI output swaps between the C and LFE channels for the HDMI output.

Per-PiP Audio PPM Meters

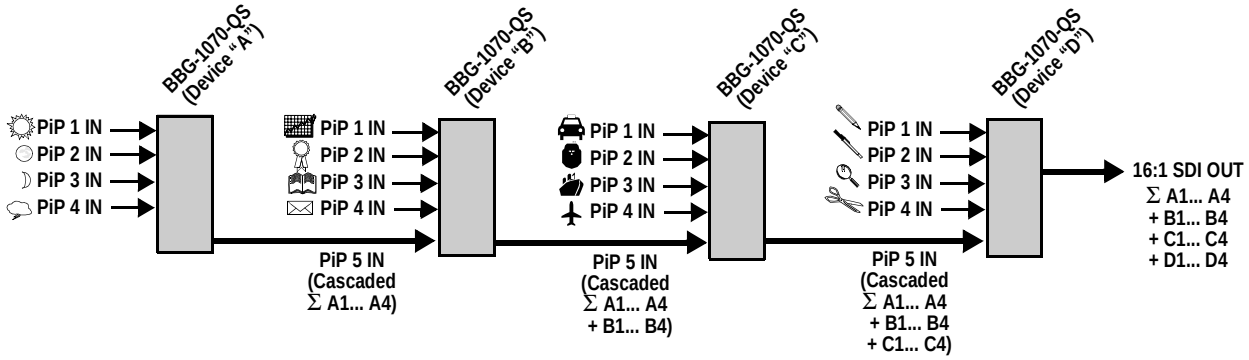
Each PiP image area has setup controls to provide audio meters in several formats (channel count) as desired. Each PiP image has an audio meter display that can display from 2-bar stereo up to all four embedded audio groups for the audio associated with the PiP input. User controls allow setting meter complement, position, size, and other graphic attributes.

Cascading (Multi-Device) BBG-1070-QS Operation and Setup Overview

(See Figure 1-3.) The BBG-1070-QS **PIP 5** input is ideally suited to allow multiple BBG-1070-QS devices to operate in a **cascading** arrangement, where four of the device inputs serve as program video inputs, and the fifth input receives the cascading combined layout of a preceding BBG-1070-QS device in a daisy-chain arrangement. In this mode, the **PIP 5** input is configured to serve as a full-size underlay with **PIP 1** thru **PIP 4** being overlays. In this manner, added PiPs can be positioned within the imported underlay resulting in a combined image of the imported underlay PiPs and the locally added PiPs.

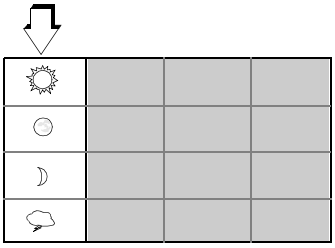
Cascading Low-Latency Operation

Low-latency modes provide for reducing I/O latency by bypassing the cascade input framesync. Low-latency modes apply framesyncing when needed (applying framesync and bypassing low-latency during these intervals). When alignment is again detected by the local device, framesyncing is correspondingly disabled and low-latency operation is again applied.



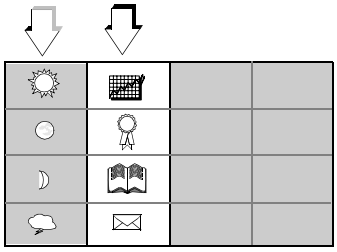
Device "A" has its controls set to position PiP1 thru PiP4 in the **1st** (left-most) column of a 4-column grid.

The device "A" output is fed to device "B" as the PiP5 full-sized **cascading** input, which serves as an underlay that rests underneath any added PiPs.



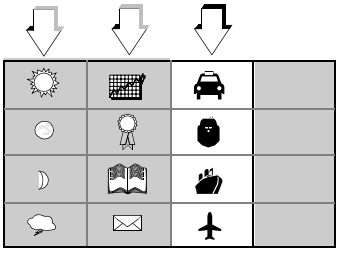
Device "B" has its controls set to position its PiP1 thru PiP4 inputs in the **2nd** column of a 4-column grid.

Along with the full-sized cascading underlay of preceding device "A", eight PiPs are now positioned in the two resulting columns.



Device "C" has its controls set to position its PiP1 thru PiP4 inputs in the **3rd** column of a 4-column grid.

Along with the full-sized cascading underlay of preceding devices "A" and "B", 12 PiPs are now positioned in the three resulting columns.



Device "D" has its controls set to position its PiP1 thru PiP4 inputs in the **4th** column of a 4-column grid.

Along with the full-sized cascading underlay of preceding devices "A" thru "C", all 16 PiPs are now positioned in the four resulting columns. This provides the 16:1 multiviewer layout using four devices ("A" thru "D") in a cascaded form.

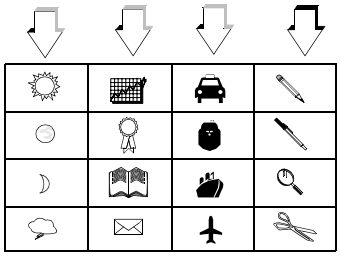


Figure 1-3 Cascaded BBG-1070-QS Example 16:1 Setup and Overview

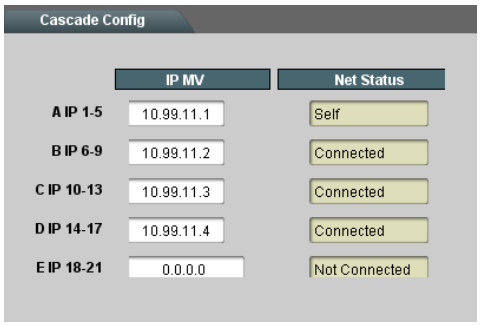
Cascade Config (Configurator) DashBoard Control Consolidation

(See Figure 1-4.) The **Cascade Config** DashBoard tabs and multi-unit network connection allows cascade chain network-connected BBG-1070-QS units to communicate with each other and expose settings and attributes from all of the units within the chain. In this setup, each unit will "see" the other units in the network chain connection, with access to PiP controls for all PiPs from any unit within the chain.

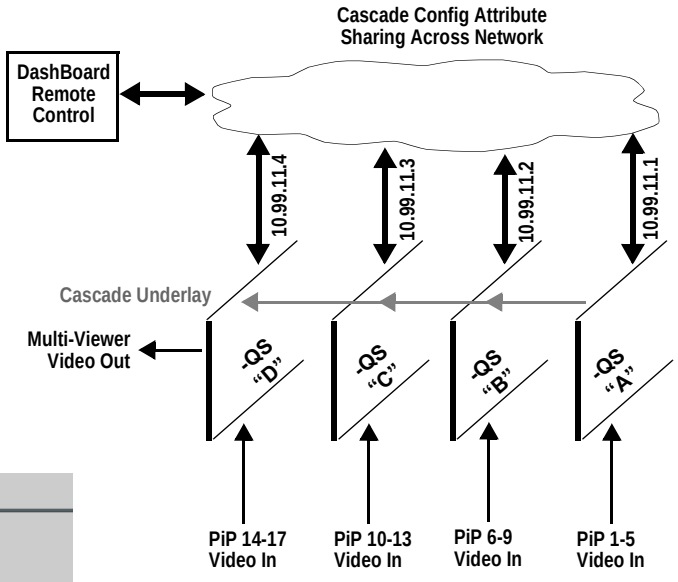
This global consolidation allows setup control of any of the PiPs from one unit. Settings can be performed on one PiP, and then be cloned across as many PiPs in the chain as desired. This removes the need to set up each unit individually, with settings manually repeated for several units. It also allows presets that can "look at" and set up all the units in the chain from a single preset.

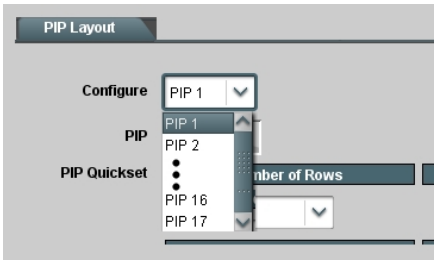
Cascade Config DashBoard tabs and multi-unit network connection allows cascade chain network-connected BBG-1070-QS units (BBG-1070-QS units "A" thru "D" in this example) to communicate with each other and centrally expose setup attributes of all of the units within the chain.

Cascade Config is designed to use the first unit as a full quint-split processor, with subsequent units in the chain taking in the cascade underlay as **In E** and additional PiP inputs as **In A** thru **In D**. In this example, a 17-input multiviewer is attained (four units providing 5+4+4+4 = 17 input channels).



BBG-1070-QS units within the chain (equipped with Ethernet-port rear modules) are connected to a shared network. This allows the units to "see" each other, with each unit exposing control attributes for **all** the units.





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For each per-PiP control, the result is **all** PiPs within the chain being exposed, allowing settings to be performed from **any** of the units and cloned to any unit as desired. User presets can encompass all units in the chain and be invoked in a single action done at one unit.

Figure 1-4 Example Cascade Config Connection and Functionality

User Control Interface

BBG-1070-QS 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. BBG-1070-QS can also use DashBoard™ remote control, where it appears as a frame with one device installed. 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-1070-QS 3G/HD/SD-SDI/CVBS Standalone Expandable Multiviewer with Advanced On-Screen unit.

Table 1-1 Technical Specifications

Item	Characteristic
Part number, nomenclature	BBG-1070-QS 3G/HD/SD-SDI/CVBS Standalone Expandable Multiviewer with Advanced On-Screen
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.

Table 1-1 Technical Specifications — continued

Item	Characteristic
Program Video Input	Five video inputs, auto-detecting CVBS or 3G/HD/SD-SDI Data Rates Supported: SMPTE 424M, 292M, SMPTE 259M-C (Inputs C thru E also support SMPTE 425 Level B) Impedance: 75 Ω terminating Receive Cable Length: 3G/HD/SD-SDI: 120/180/320 m (Belden 1694A) Return Loss (SDI): > 15 dB up to 1.485 GHz > 10 dB up to 2.970 GHz
Serial Digital PiP Video Output	Number of Outputs: One 3G/HD/SD-SDI BNC 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
SDI Input-Output Latency (720p5994)	Basic I/O latency < 1.5 frames (max) PiP channel derived from cascaded preceding-device output consists of source device basic delay with < 2 line added delay.
HDMI PiP Video Output	HDMI CEA-861D
GPIO	GPI and GPO; opto-isolated GPO Specifications: Max I: 120 mA Max V: 30 V Max P: 120 mW GPI Specifications: GPI LO @ Vin < 1.5 V GPI HI @ Vin > 2.3 V Max Vin: 9 V
Frame Reference Input	Looping 2-BNC connection. SMPTE 170M/318M “Black Burst”, SMPTE 274M/296M “Tri-Level” Return Loss: >35 dB up to 5.75 MHz
Redundant (or spare) AC power supply (optional)	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.

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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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Chapter 2

Installation

Overview

This chapter contains the following information:

- Installing the BBG-1070-QS (p. 2-1)
- Rear Panel Connections (p. 2-2)

Installing the BBG-1070-QS

Note:
- Where BBG-1070-QS 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-1070-QS in locations marked with stamped “x”. If feet are not affixed, chassis bottom cooling vents will be obscured.
- Where BBG-1070-QS 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-1070-QS to be mounted and securely attached to a 1 RU tray that fits into a standard EIA 19” rack mounting location. Install BBG-1070-QS unit(s) into tray as described and shown here.

1. If installing BBG-1070-QS using optional frame Mounting Tray BBG-1000-TRAY, install BBG-1070-QS in tray as shown in Figure 2-1.

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

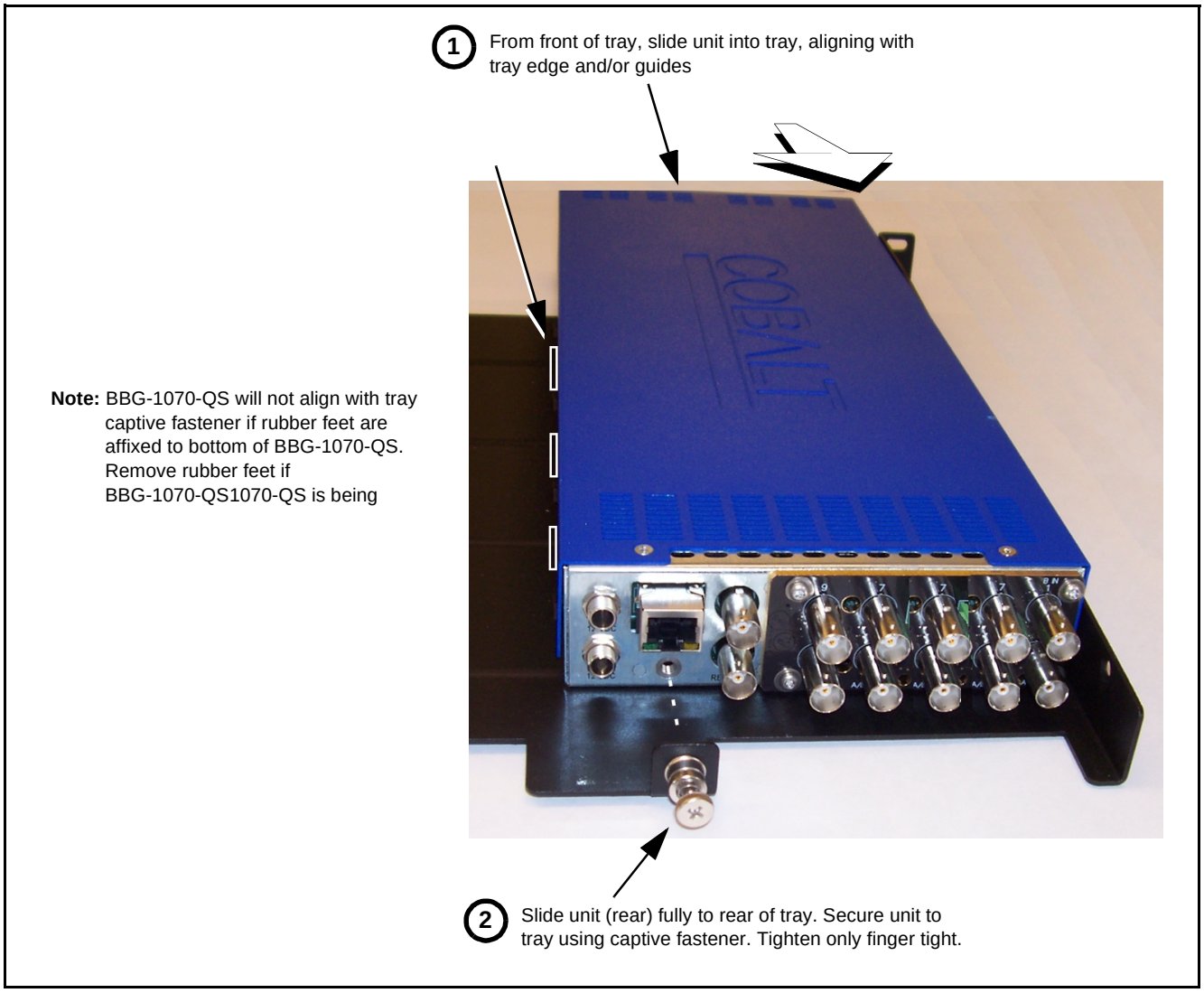


Figure 2-1 Mounting BBG-1070-QS Using Frame Mounting Tray

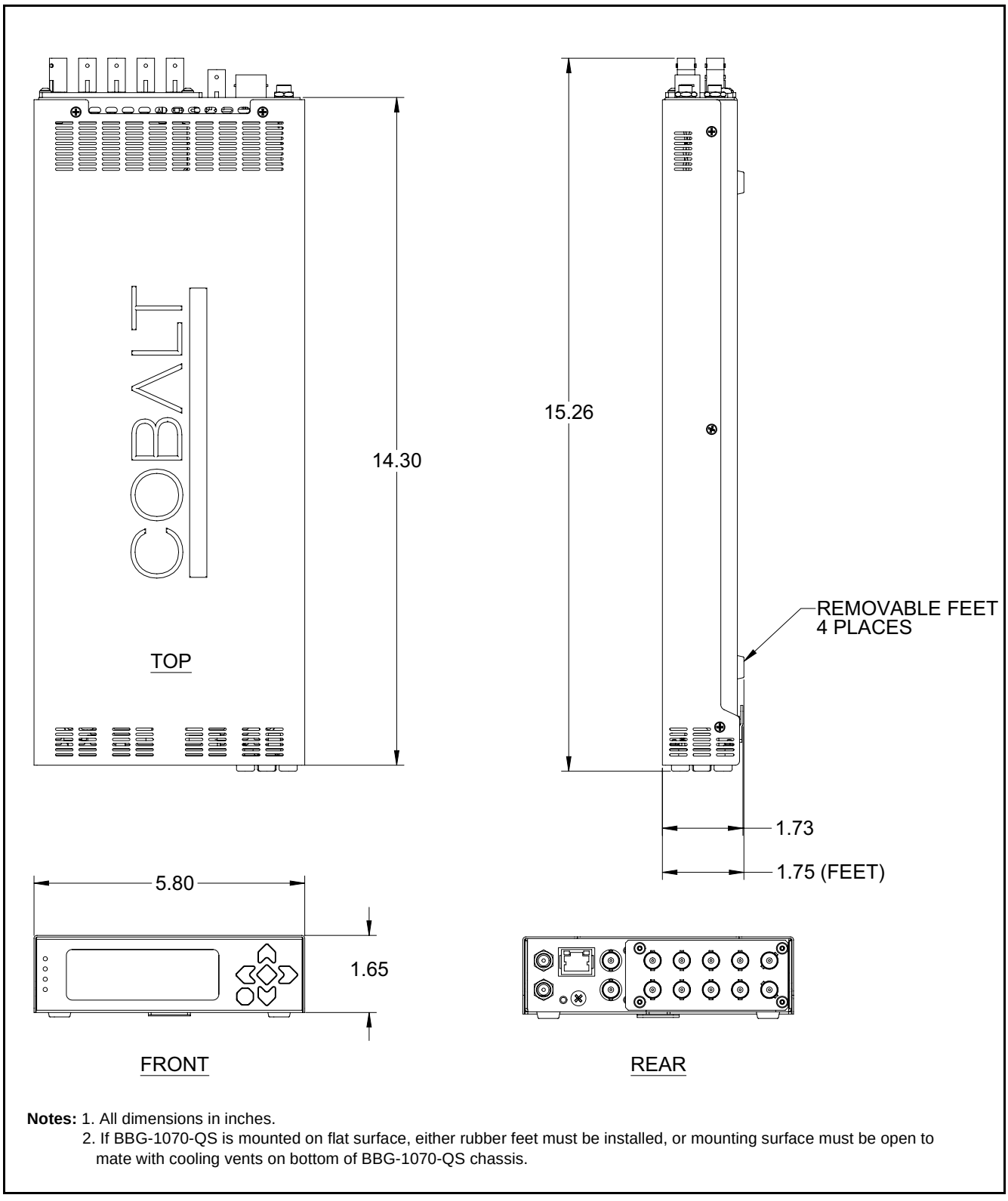
BBG-1070-QS Unit Dimensions

Figure 2-2 shows the BBG-1070-QS physical dimensions and mounting details for cases where BBG-1070-QS will be installed in a location not using the optional **BBG-1000-TRAY** mounting tray.

Rear Panel Connections

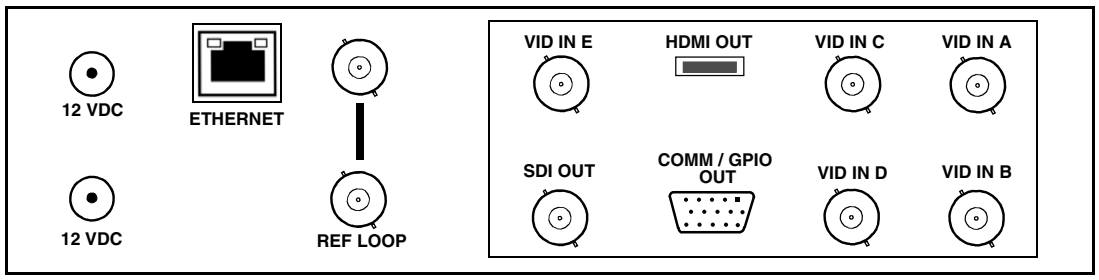
Perform rear panel cable connections as shown in Figure 2-3.

Note:
- The BBG-1070-QS BNC inputs are internally 75-ohm terminated. It is not necessary to terminate unused BNC video inputs or outputs.
- External frame sync reference signal (if used) must be terminated if a looping (daisy-chain) connection is not used. Unterminated reference connection may result in unstable reference operation.



Notes: 1. All dimensions in inches.
2. If BBG-1070-QS 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-1070-QS chassis.

Figure 2-2 BBG-1070-QS Dimensional Details

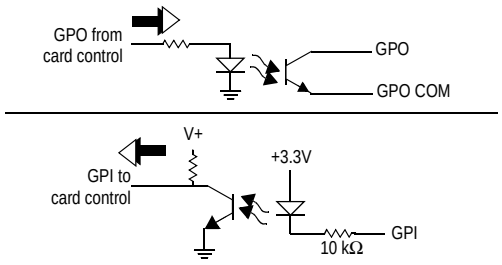


COMM / GPIO OUT

1 - *COM A_RX2 / 422(+)
2 - *COM A_TX2 / 422(+)
3 - COM B_RX2 / 422(+)
4 - GPO OUT1
5 - GND
6 - *COM A_RX1 / 422(-)
7 - *COM A_TX1 / 422(-)
8 - COM B_RX1 / 422(-)
9 - GPI IN5
10 - GPI IN4
11 - GPI IN1
12 - GPI IN2
13 - GPI IN3
14 - NC
15 - NC

* Port can be GUI-configured as two RS-232 ports (Tx and Rx), or as a full-duplex RS-422 port.

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 for connection to house black burst or tri-level reference connections
VID IN A thru **VID IN E**	(5) PiP Video In BNCs; auto-detecting as 3G/HD/SD-SDI or CVBS
SDI OUT	(1) 3G/HD/SD-SDI PiP Combined Video Out
HDMI OUT	(1) HDMI/DVI Combined Video Out
COMM/GPIO OUT	DB-15(F) multi-pin connector that provides connections (as denoted in table in rear panel illustration above)



GPIO uses equivalent opto-isolated circuits shown below.

GPO Specifications:
Max I: 120 mA
Max V: 30 V
Max P: 120 mW

⚠ Pullup R >500Ω resistor is recommended when using 5V control.

GPI Specifications:
GPI LO @ Vin < 1.5 V
GPI HI @ Vin > 2.3 V
Max Vin: 9 V

Figure 2-3 BBG-1070-QS Rear Panel Connectors

Chapter 3

Setup/Operating Instructions

Overview

This chapter contains the following information:

- BBG-1070-QS Front Panel Display and Menu-Accessed Control (p. 3-1)
- Connecting BBG-1070-QS To Your Network (p. 3-3)
- Control and Display Descriptions (p. 3-5)
- Checking BBG-1070-QS Device Information (p. 3-8)
- BBG-1070-QS Function Menu List and Descriptions (p. 3-9)
- Uploading Firmware Using Web Interface and GUI (p. 3-63)
- Front Panel User Menus (p. 3-64)
- Troubleshooting (p. 3-64)

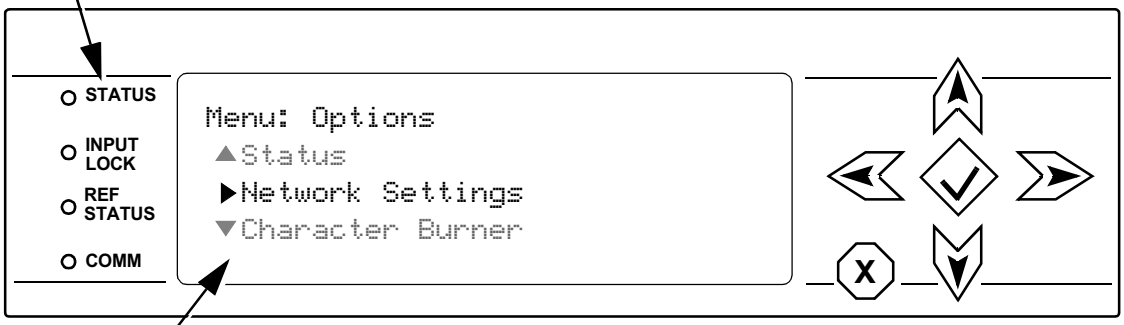
Perform the setup procedures here in the sequence specified.

Note: All instructions here assume BBG-1070-QS is physically connected to the control physical network as described in Chapter 2. Installation.

BBG-1070-QS Front Panel Display and Menu-Accessed Control

Figure 3-1 shows and describes the BBG-1070-QS 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-1070-QS Front Panel Display and Menu Controls

Connecting BBG-1070-QS To Your Network

BBG-1070-QS 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-1070-QS 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-1070-QS To Network

1. Power-up BBG-1070-QS and connect Ethernet cable connection to media. Wait for BBG-1070-QS to complete booting. When **`Product: BBG-1070`** ... 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`**.

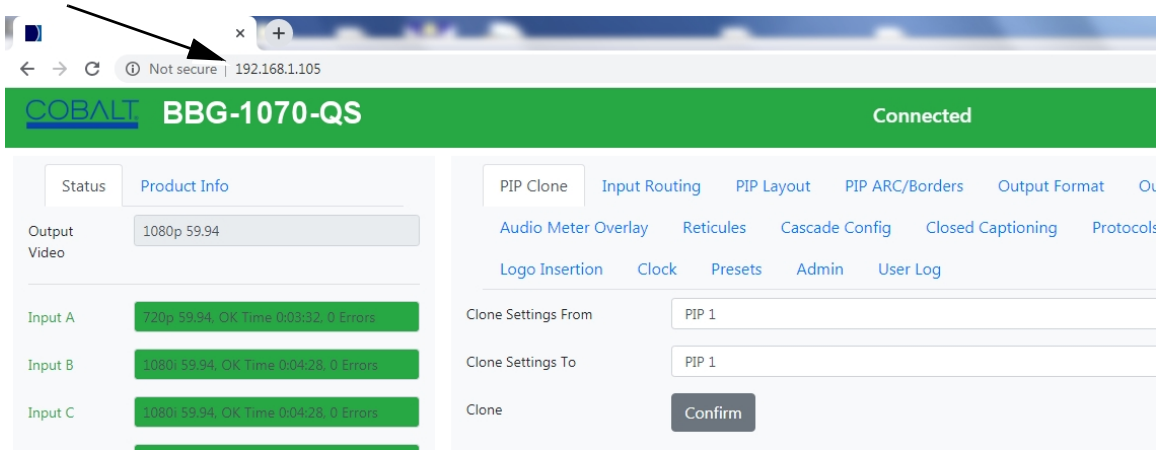
4. Configure the following fields as desired and appropriate for your network connection (examples shown below).

```
Menu: Network Settings
  IP: 10.99.11.169
  Netmask: 255.255.255.0
  Gateway: 10.99.11.1
  Mode: Static
```

5. Press (X) to commit changes and exit the setup menu.
Note: Current IP address of BBG-1070-QS can now be checked from the front panel by accessing this at any point.

6. At this point, BBG-1070-QS 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-1070-QS



Finding a BBG-1070-QS Device in DashBoard

(See Figure 3-2) If BBG-1070-QS is configured with an address within a network also available via DashBoard, a BBG-1070-QS device appears as a frame entity in the DashBoard Basic Tree View.

Note: BBG-1070-QS DashBoard remote control is also available by opening the device in DashBoard similar to opening an openGear® card.

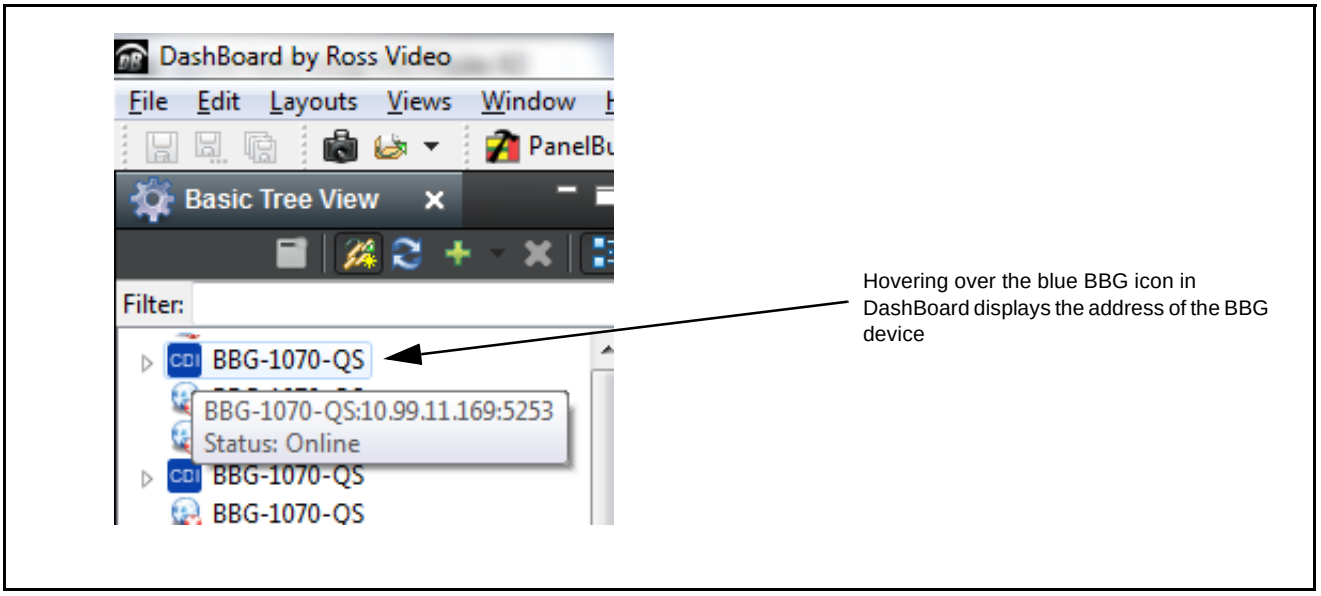


Figure 3-2 Finding BBG-1070-QS Using DashBoard

Control and Display Descriptions

This section describes the web user interface controls for using the BBG-1070-QS.

The format in which the BBG-1070-QS 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-1070-QS device are organized into function **menus**, which consist of parameter groups as shown below.

Figure 3-3 shows how the BBG-1070-QS device and its menus are organized, and also provides an overview of how navigation is performed between devices, function menus, and parameters.

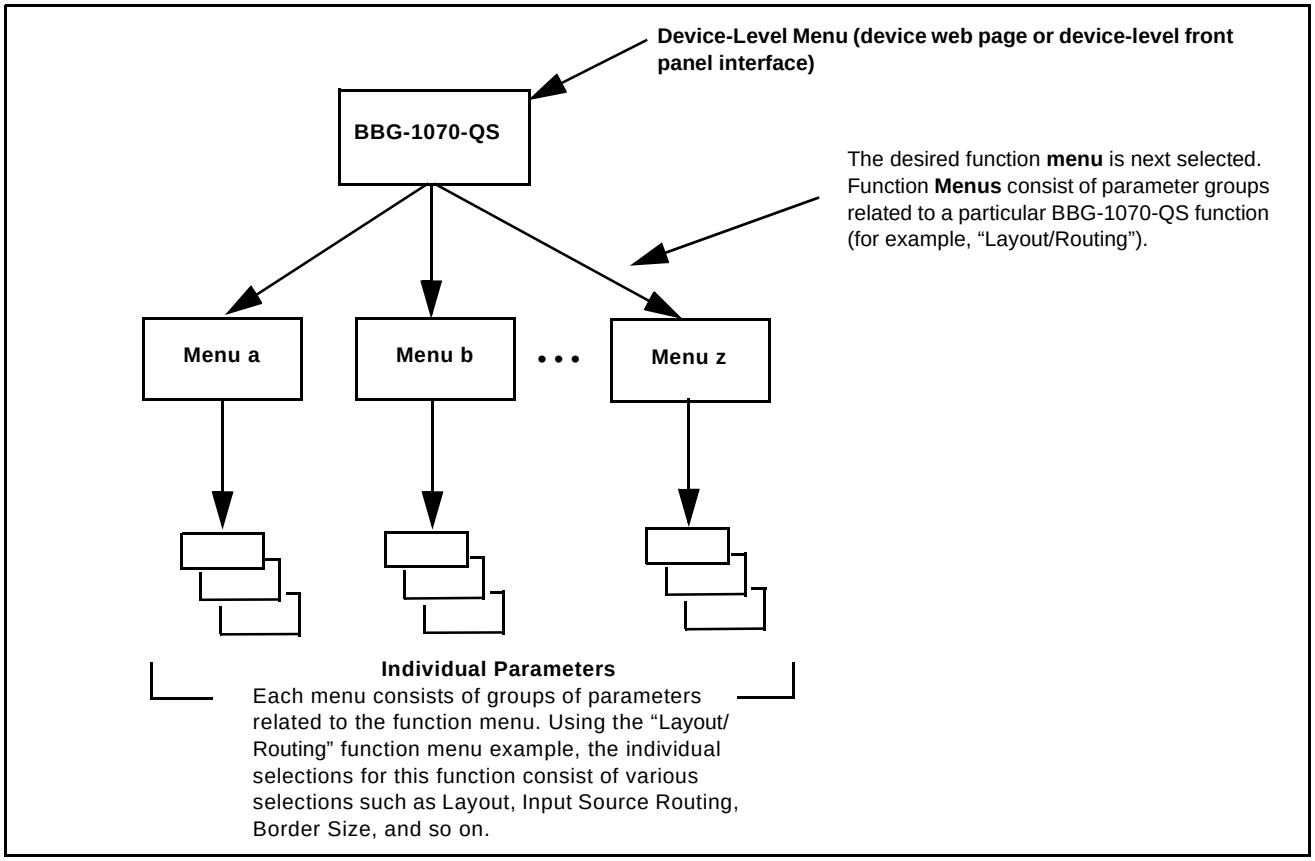
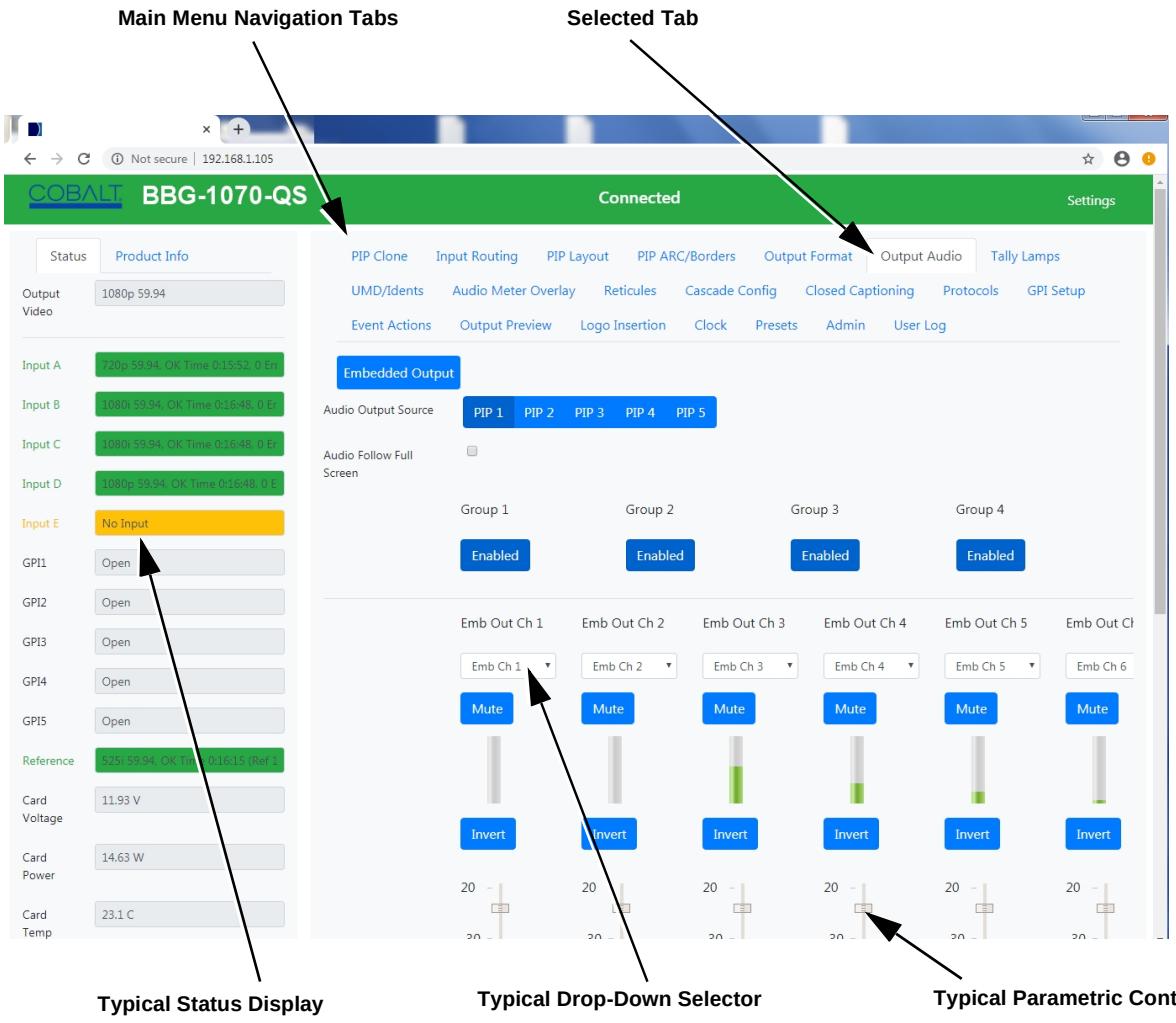


Figure 3-3 Function Submenu/Parameter Submenu Overview

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 **Output Audio** main menu tab is selected, with the overall pane now showing all sub-menu items related to the output audio 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-1070-QS user interface theme selection offers light and dark themes suited for various users and environments.

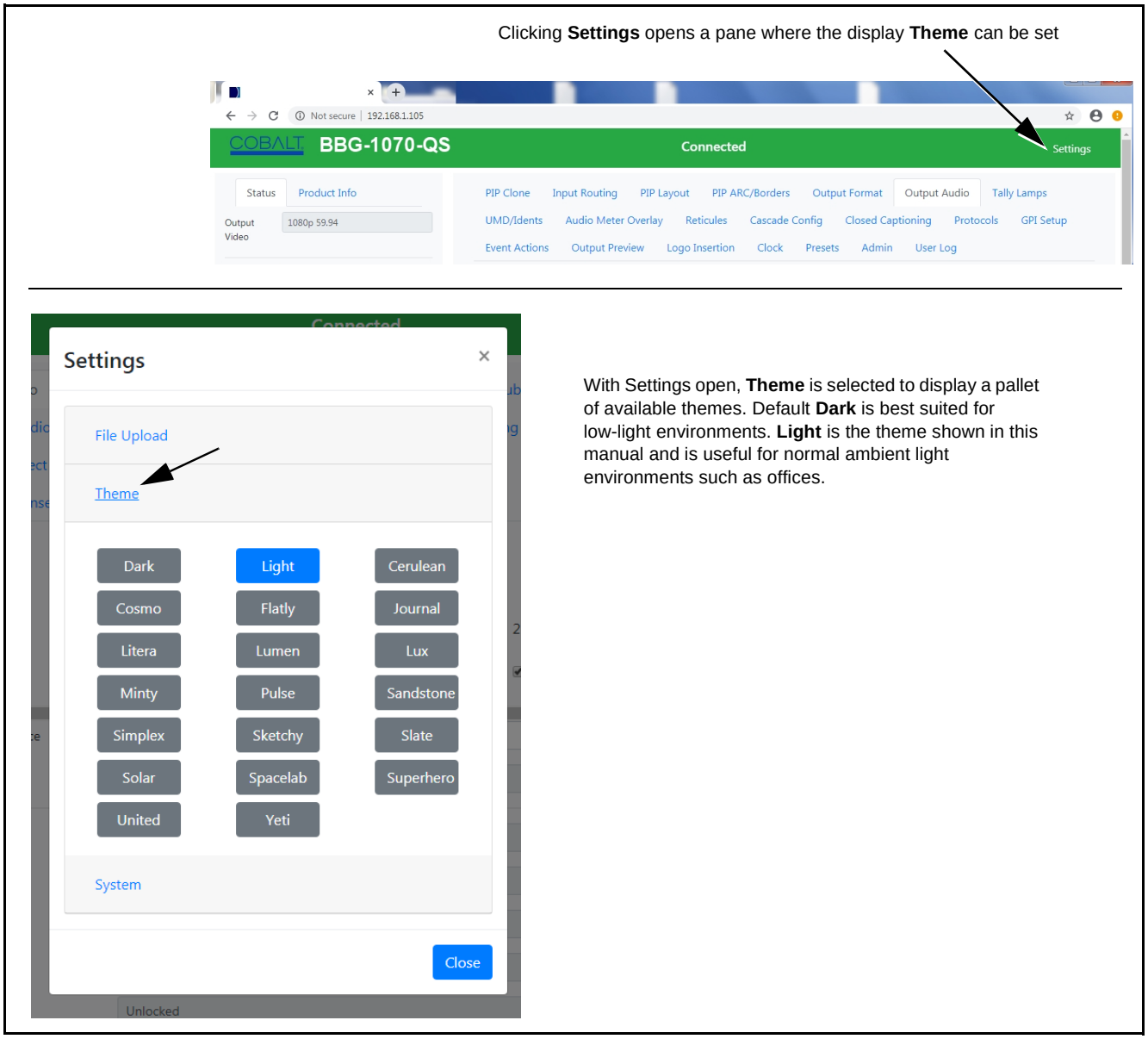


Figure 3-5 Web UI Display Themes

Checking BBG-1070-QS Device Information

The operating status and software version the BBG-1070-QS device can be checked by clicking the **Status** main menu tab. Figure 3-6 shows and describes the BBG-1070-QS 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. 3-64) for corrective action.

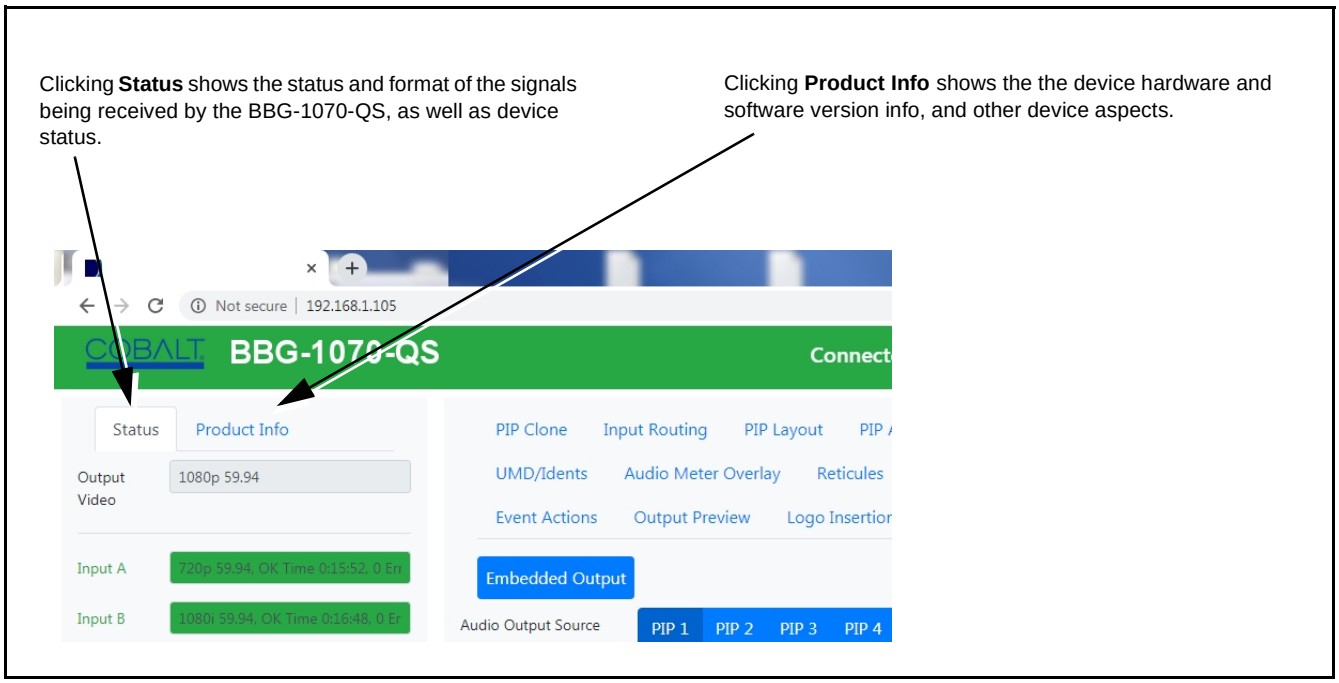


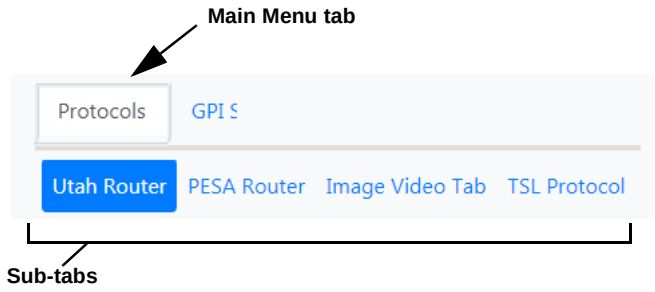
Figure 3-6 BBG-1070-QS Device Info/Status Utility

BBG-1070-QS Function Menu List and Descriptions

Table 3-1 individually lists and describes each BBG-1070-QS function menu 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 show DashBoard UI. Web UI is similar.

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



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

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

Function Menu Item	Page	Function Menu Item	Page
Input Routing	3-10	Cascade Config Setup Controls	3-41
PIP Clone Global Controls	3-13	Protocols (Router Integration) Controls	3-46
PIP Layout Controls	3-14	GPI Setup Controls	3-48
PIP ARC/Borders Controls	3-19	Event Actions Setup Controls	3-49
Tally Lamp Insertion Controls	3-21	Output Preview	3-54
UMD/Identification Text Insertion Controls	3-23	User Graphic Overlay (Logo) Insertion Controls	3-55
Audio Meter Overlay Controls	3-31	Clock (Wall-Clock Time/LTC) Controls	3-56
Reticules Controls	3-35	Presets	3-57
Output Format Controls	3-38	Admin (Log Status/Firmware Update)	3-61
Output Audio Routing/Controls	3-40	User Log	3-62

Table 3-1 BBG-1070-QS Function Menu List

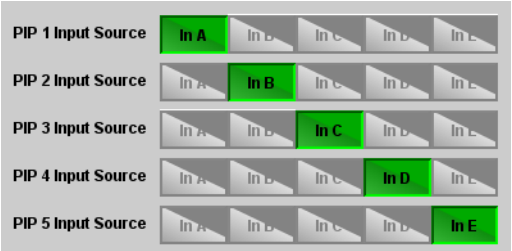
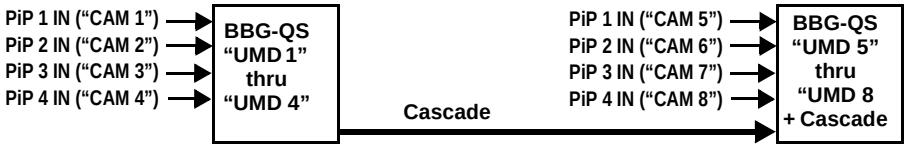
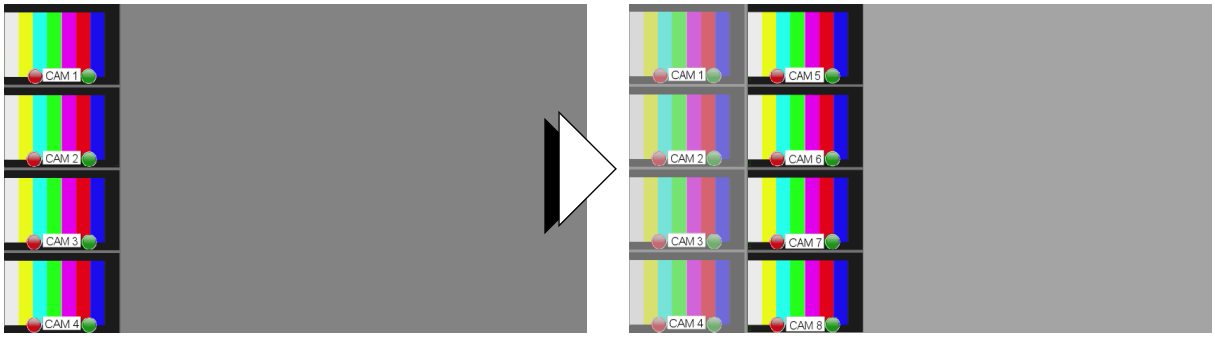
Input Routing	Select inputs to be applied to each PiP. Also provides controls for using Cascade Mode (where required).
• **PiP Input Source Select** 	Routes the SDI inputs (VID IN A thru VID IN E as **In A** thru **In E**, respectively) to the respective PiP input. (In this example, VID IN A thru VID IN E are respectively routed as PIP 1 thru PIP 5 input sources.) **Note:** A CVBS input is automatically detected by the unit input, with the CVBS ADC converter automatically engaged.
• **Identify PIPs Button** 	Pressing this button momentarily displays an overlay on each PiP image that correlates the PiP to its PiP identity. This control is useful if you “lose track” of which displayed PiP correlates to which PiP input channel. Pressing Identify PIPs shows the PIP assignment in the merged output (display ceases after about 3 seconds)

Table 3-1 BBG-1070-QS Function Menu List — continued

Input Routing	(continued)
• **Cascade Mode Select** 	**Note:** • See Cascading (Multi-Device) BBG-1070-QS Operation and Setup Overview (p. 1-8) in Chapter 1, Introduction for an overview of multi-unit cascading that provides multiviewer images exceeding that of a single quint-split unit. • See Cascade Mode Using PiP Layout QuickSet Template Presets (p. 3-16) for examples control settings using Cascade Mode along with other per-PiP settings to provide a cascaded multiviewer image setup. **Cascade Mode Select** sets PiP 5 as a input to be used to receive a cascade output from another BBG-1070-QS unit or to be set as a regular fifth PiP input as follows: • **Enabled:** Sets PiP 5 input to receive a cascade output from another BBG-1070-QS unit. Because this cascaded underlay will have any burn-in insertions already in place from the upstream source unit, all PiP 5 burn-in insertions are automatically disabled in this mode. Also, since this PiP will serve as an underlay for any added PiPs, in this mode PiP 5 is inserted full-size, with all sizing and positioning controls locked out for this PiP insertion. • **Disabled:** Sets PiP 5 input to be used as regular input, with full aspect and sizing/positioning control and burn-ins as PiPs 1 thru 4. Use this mode when only a single, non-cascaded BBG-1070-QS is to used for multi-image processing.





First BBG-1070-QS receives “CAM 1” thru “CAM 4”, as PiP 1 thru PiP 4 inputs. This output is fed to a second, daisy-chained BBG-1070-QS as a **cascading** input.

The second BBG-1070-QS receives “CAM 5” thru “CAM 8”, as PiP 1 thru PiP 4 inputs and is set to position these images in a 2nd column. The imported PiP 5 cascade input (carrying “CAM 1” thru “CAM 4”) serves as an underlay.

The resulting output (consisting of eight PiPs) now consists of the imported cascading “CAM 1” thru “CAM 4” images, as well as the local input “CAM 5” thru CAM 8” images.

Note: When using cascade mode, the symmetrical alignments shown here are available as “QuickSet” presets using the per-PiP controls as described in PIP Layout Controls (p. 3-14) and in the example shown in Cascade Mode Using PiP Layout QuickSet Template Presets (p. 3-16).

Table 3-1 BBG-1070-QS Function Menu List — continued

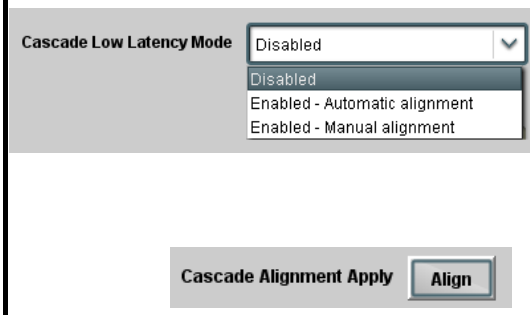
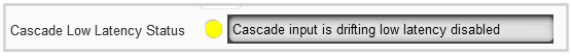
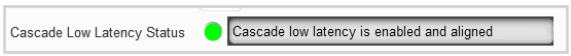
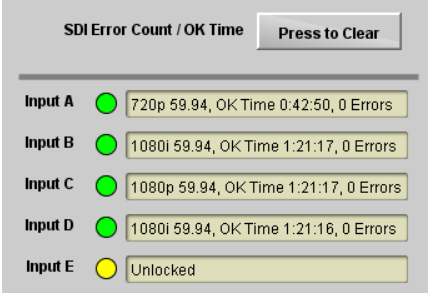
Input Routing	(continued)
Unit **Local** inputs are inputs received by the unit to serve as an individual PiP image. A **Cascade** input is an image imported into the unit from an upstream BBG-1070-QS used in a multi-unit cascading multiviewer arrangement. An input used as a cascade input has controls related to local setup locked out (for example, burn-ins and sizing) since a cascading input serves as an underlay with all its burn-ins and other attributes already provided by the upstream unit. Note that on a downstream unit receiving a cascade input, this input should be considered independent of the local input positioning and attribute control provided by the downstream unit.	
• Cascade Mode Low-Latency Mode Select 	Provides modes where unit I/O latency can be reduced (by bypassing cascade input framesync) using the choices shown and described below. • **Disabled:** Normal default mode where an upstream cascaded input is **always** aligned to the local unit's selected reference. This results in the normal, expected one-frame delay due to the framesyncing action. Where low-latency is not required, it is recommended to use this mode. • **Enabled – Automatic alignment:** This mode applies framesyncing when needed (**applying** framesync and **bypassing** low-latency during these intervals). When alignment is again detected by the local unit, framesyncing is correspondingly disabled and low-latency operation is again applied. Because this mode can automatically enable and disable framesyncing, an occasional video "hit" should be expected when using this mode. • **Enabled – Manual alignment:** Similar to the Automatic alignment mode, this mode will disable low-latency framesync bypass when needed. However, it will not apply alignment until the **Cascade Alignment Apply** button is pressed, thereby circumventing an unexpected auto-align video "hit". **Note:** Where a multi-unit cascaded arrangement is being used, locking **all** inputs and **all** BBG-1070-QS units to the same house reference will optimize alignment and help allow unimpeded low-latency operation (with Latency Mode being set to Enabled - Automatic alignment).
• Cascade Mode Low-Latency Status	Displays the low-latency framesync bypass status as shown below.
	• Green indicator and "disabled" message indicates low-latency framesync bypass is disabled by Low Latency control being set to Disabled.
	• Yellow indicator and "drifting" message indicates low-latency framesync bypass is disabled by event requiring framesync with low-latency correspondingly disabled. This message typically appears when auto mode is selected and cascaded input is experiencing timing drift versus local timing.
	• Yellow indicator and "requires alignment" message indicates cascading input is now detected as being locked, but local unit requires **Align** button to be pressed to remove any buffer excess and re-establish sync.
	• Green indicator and "enabled and aligned" message indicates cascading input is now detected as being locked, with full bypass of framesyncing and low-latency now is effect.
• SDI Error Counter/Clear 	In conjunction with the device **Status** page and its Input status indicators (where an SDI input(s) is being used) allows running error totals to be cleared. **Status** page shows input status and **OK Time / Errors** for inputs receiving SDI.

Table 3-1 BBG-1070-QS Function Menu List — continued

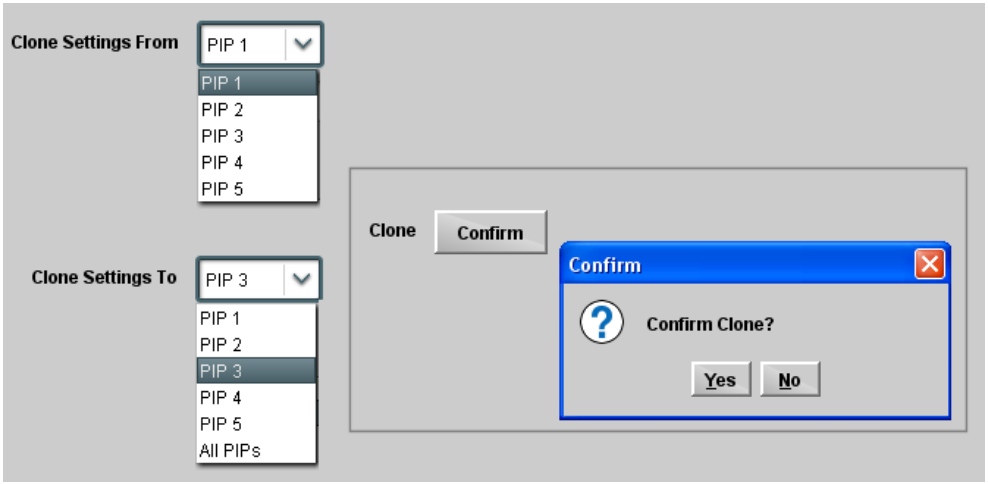
PIP Clone	Provides controls to set global "cloning" of graphics attributes settings from one PiP to another. This helps in providing a consistent and easily set layout across selected PiPs.

Cloned settings can significantly affect layouts. Make certain all aspects of layouts/attributes are understood (as described in this Chapter) before applying clones to other PiPs. Make certain only desired attributes are cloned as intended (using the controls described below). Individual tabs also have clone controls which can be used to clone only certain layout attributes to other PiPs as desired.

Note: • When cloned settings are applied, they can be left as is, or changed as desired on the PiP receiving the cloned settings. The cloning can serve as a baseline or as the final intended setup as desired.

• For multi-unit setup using Cascade Config mode/setup, Clone Settings **from any** of the units in the chain can be cloned **to any** unit in the chain (i.e., **all** units in the chain appear in the **Clone Settings From** and **Clone Settings To** drop-downs). See Cascade Config Setup Controls (p. 3-41) for more information.

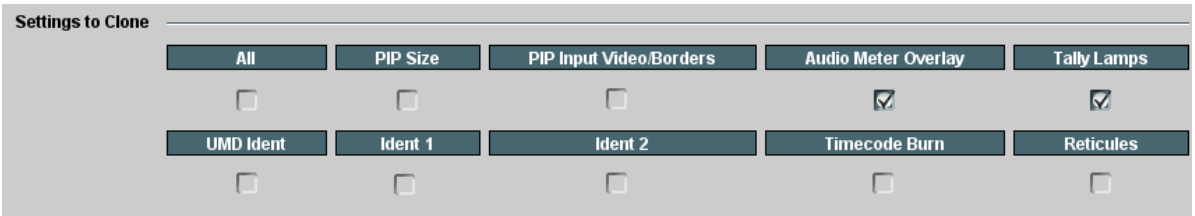
• **Clone Settings From/To PiP Selector**	**Clone Settings From** and **Clone Settings To** drop-downs select the PiP to serve as the cloned source, and the PiP(s) to receive the cloned settings.



In the example here, **PIP 1** is the settings source to be cloned for **PIP 3**. The **Confirm** pop-up allows applying or backing out of the clone operation.

Note: This dialog is also present on several layout tabs (for example, "Tally Lamps") described later in this Chapter. As such, cloning can be performed on this page/tab, or on tabs specific to a particular function.

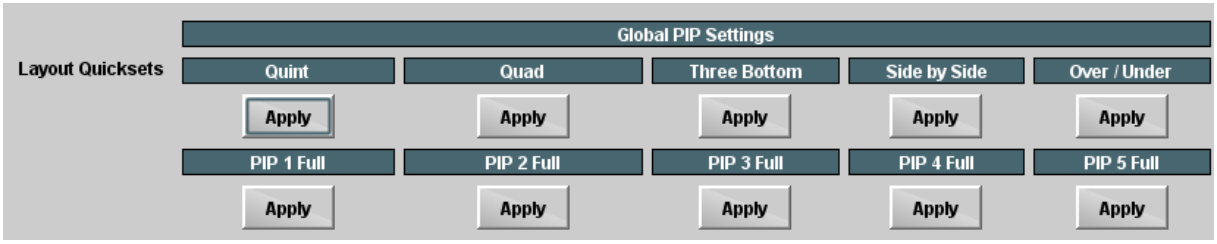
• **Clone Settings Attribute Select (Settings to Clone)**	Check boxes allow all (global), or only certain attributes to be cloned to a receiving PiP(s) as desired.



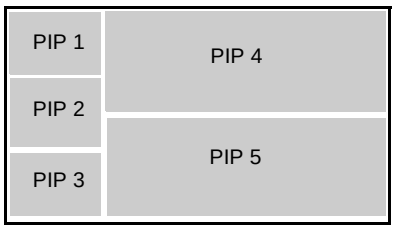
In the example here, specifically the **Audio Meter Overlays** and **Tally Lamps** settings will be applied to the cloned PiPs. Any combination of checks can be applied as desired.

Table 3-1 BBG-1070-QS Function Menu List — continued

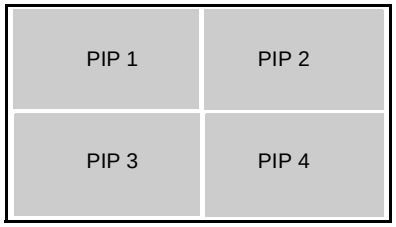
PIP Layout	Provides PiP layout presets templates and other controls related to the number of splits and layout for the overall merged-image output.
• **Layout Preset Template Select**	For **local** (**non-cascading) inputs**, selects from several preset global (base) layout templates from the choices shown and depicted below. **Note:** The Preset templates described below are intended for non-cascading layouts. For symmetrical cascaded layouts (layouts exceeding five PiPs), see Cascade Mode Using PiP Layout QuickSet Template Presets (p. 3-16).



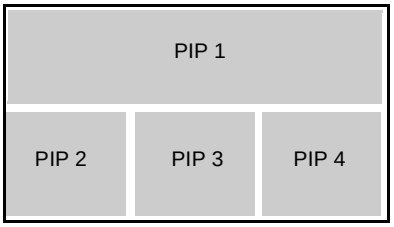
Quint



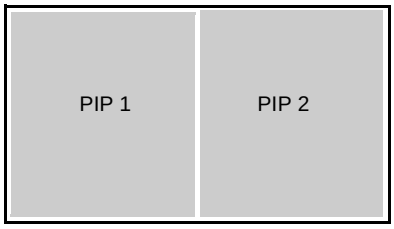
Quad (symmetrical)



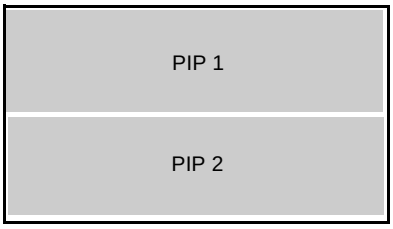
Three Bottom



Side-by-Side



Over / Under



PiP 1, 2...thru PiP 5 Full

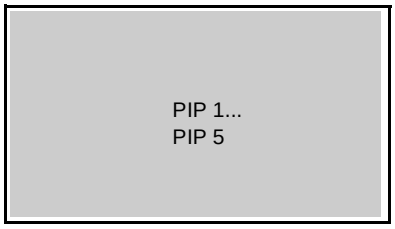


Table 3-1 BBG-1070-QS Function Menu List — continued

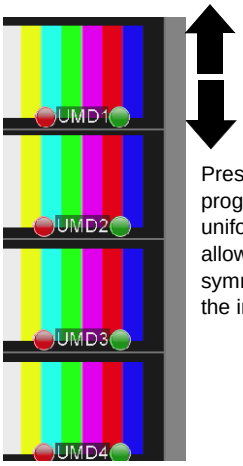
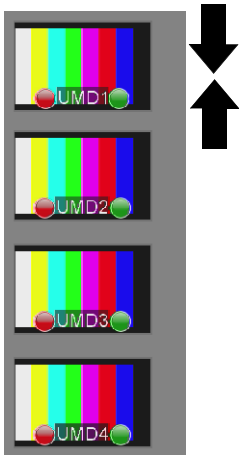
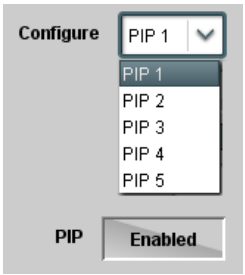
PIP Layout	**(continued)**
• **Decrease/Increase Spacing Controls** 	Provides tailoring of the PiP image sizes relative to background fill.
 Pressing **Decrease** progressively expands all PiPs uniformly over the fill areas, allowing each PiP to symmetrically occupy more of the image area	Pressing **Increase** progressively reduces all PiPs, allowing fill to symmetrically occupy more of the PiP image area 
• **Layout Flip Controls** 	For local inputs to the unit, allows PiP layout to flip top/bottom or L/R.
Note: • The following controls are used for **individual PiP (per-PiP)** layout and positioning control. • Any sizing/positioning performed using cloning controls can be overwritten using these controls.	
• **PiP Size/Position Edit/Select** 	Individually selects any of the five PiP inputs to be selected for sizing/ positioning edits, and enables PiP insertion into the merged output. (In this example, PiP 1 is selected for editing.) **Note:** • These controls are intended only for local inputs and not a cascade underlay imported from an upstream BBG-1070-QS unit. • For multi-unit setup using Cascade Config mode/setup, Clone Settings **from any** of the units in the chain can be cloned **to any** unit in the chain (i.e., **all** units in the chain appear in the **Clone Settings From** and **Clone Settings To** drop-downs). See Cascade Config Setup Controls (p. 3-41) for more information.

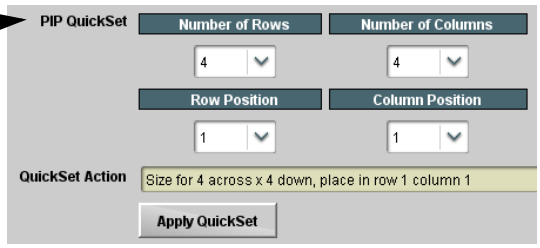
Table 3-1 BBG-1070-QS Function Menu List — continued

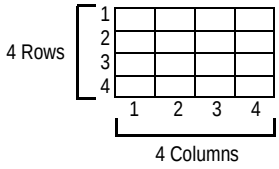
PIP Layout	(continued)
• **PiP Layout QuickSet Template Presets (Cascade Mode)**	Layout QuickSets provide for layouts consisting of symmetrical **columns** and **rows** that are intended for cascade layouts where, for example, an upstream BBG-1070-QS provides a first column of PiP images, and then a second BBG-1070-QS provides the second column of PiP images. The descriptions here describe using the controls and also provide examples using the controls and the resulting multi-unit cascade setups.

The **Number of Rows** and **Number of Columns** drop-downs set the grid format to be used for a multi-unit, multiviewer setup. Once the number of rows/columns is set, this is propagated to other PiP controls on the unit, since this will be a unit global setting that allows other PiP insertions to conform with the desired grid layout.

The **QuickSet Action** field shows a summary of the configured layout. Click **Apply QuickSet** to enact the layout setup.

In this example, a 4-row x 4-column grid is being set up (which can provide a 16:1 multiviewer layout using four BBG-1070-QS units, each handling four PiP images).





The **Row Position** and **Column Position** drop-downs set where in the grid the PiP image will be inserted (in this example, position row 1 / column 1).

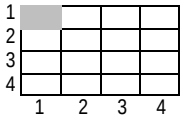


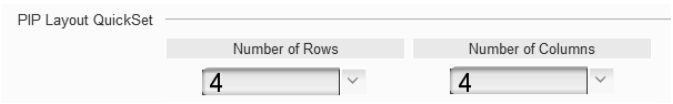
Table 3-1 BBG-1070-QS Function Menu List — continued

PIP Layout	(continued)

Example 16:1 Multiviewer Setup Using Multi-Unit Cascading Mode and Quicksets

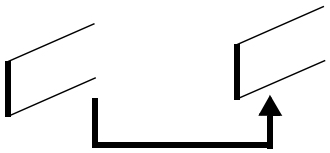
This example shows a layout setup that provides a 16:1 multiviewer output. It uses four BBG-1070-QS units, each handling four PiP inputs, and with each unit set to work with a 16-PiP (4x4) grid.

1. First, on the **PIP 1 > PIP Position** tab a 4x4 grid is set up. This setup will propagate to the PiP 2 thru PIP 4 same controls on the unit. (This must also be done for any other BBG-1070-QS units in the chain.)



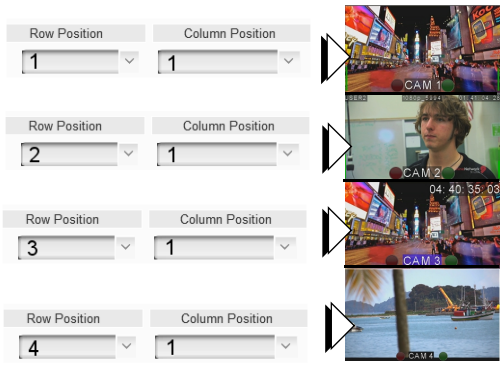
2. On the **first** BBG-1070-QS, PiP 1 thru PiP 4 images ("CAM 1 thru "CAM 4") are routed and positioned as Row Positions 1 thru 4, all in Column 1. This results in the first column of four images for the 16:1 multiviewer setup.

The SDI output of this unit is routed to the next BBG-1070-QS as the PIP 5 input, with this unit set up with **Cascade Mode > Enabled**. This places the first unit output as an underlay with its merged PiP output positioned in the first column.



Unit A:
"CAM 1" – "CAM 4" in 1st column

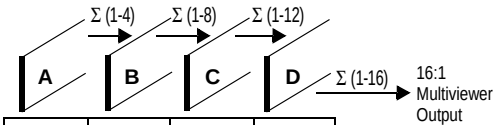
Unit B:
"CAM 1" – "CAM 4" in 1st column imported as underlay.
"CAM 5" – "CAM 8" (unit 2 local inputs 1-4) positioned in 2nd column.



3. On the **second** BBG-1070-QS unit, PiP 1 thru PiP 4 images ("CAM 5" thru "CAM 8") are routed and positioned as Row Positions 1 thru 4, all now set in Column 2.

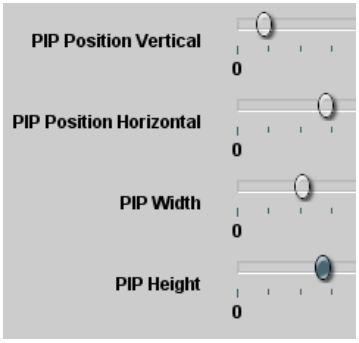
Along with the underlay imported from unit 1 as column 1, this now results in the first column of four underlay imported images and the second column of four more locally inputed PiP images ("CAM 1" thru "CAM 8").

4. Using a total of four BBG-1070-QS units (**Unit A** thru **Unit D**) similarly configured in a daisy-chain arrangement, the SDI output of an upstream BBG-1070-QS provides the cumulative built-up underlay, and allows positioning local PiP images in successive columns. In this example, four units each are set to progressively position local PiP inputs in columns 1 thru 4, respectively. This results in four multiviewer columns consisting here of:
"CAM 1" – "CAM 4"
"CAM 5" – "CAM 8"
"CAM 9" – "CAM 12"
"CAM 13" – "CAM 16"

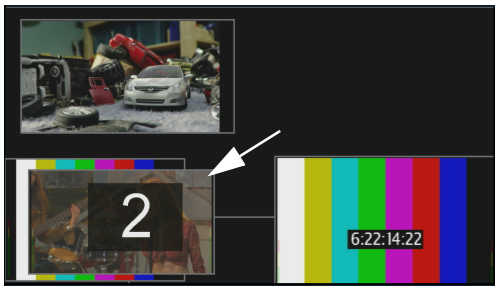


1	5	9	13
2	6	10	14
3	7	11	15
4	8	12	16

Table 3-1 BBG-1070-QS Function Menu List — continued

PIP Layout	(continued)
• **PiP Custom Positioning Controls** 	Controls allow the positioning and sizing of the PiP within the overall merged output image. • **Position Vertical** and **Position Horizontal** sets the PiP origin location (Vertical in lines; horizontal in pixels) • **Width** and **Height** sets the PiP size (Vertical in lines; horizontal in pixels) The **PIP Size** display shows the PiP size and H/V origin point position. **Note:** Even if a PiP layout QuickSet was applied, these controls allow manipulating PiP position and size as desired.

PiP 2 with custom positioning/sizing placed in normal upper-right corner of merged quint-split output

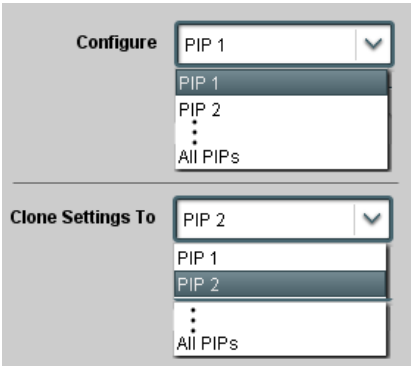
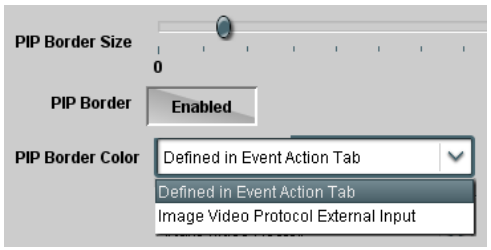


PiP 2 with new custom positioning/sizing now places PiP 2 in lower-left corner (over PiP 3) of merged quint-split output

When using custom positioning, it is helpful to first size all the PiP small (as thumbnail sized). This helps avoid a PiP "hiding" underneath another PiP. Pressing the **Identify PIPs** button as shown here will help make sure each PiP input correlation is known, and all PiP are present as expected.

With the PiP identities now known, one-by-one each PiP can be sized and positioned to its desired size/position as shown in the example here.

Table 3-1 BBG-1070-QS Function Menu List — continued

PIP ARC/Borders	Provides controls to individually set border, ARC, and custom sizing for each local PiP input.
• **PiP Configure Select/Clone** 	Individually selects any of the five PiP inputs to be selected for sizing/positioning edits (as described below). Allows cloning settings to other PiPs. **Note:** • These controls are intended only for base program video inputs and not a cascade underlay imported from an upstream BBG-1070-QS unit. • For multi-unit setup using Cascade Config mode/setup, Clone Settings **from any** of the units in the chain can be cloned **to any** unit in the chain (i.e., **all** units in the chain appear in the **Clone Settings From** and **Clone Settings To** drop-downs). See Cascade Config Setup Controls (p. 3-41) for more information.
• **PiP Border Size/Enable Control** 	• **PIP Border Size** sets the border thickness for **all** PiP borders. • **PIP Border** enables/disables border insertion. • **PIP Border Color** allows setting border colors as directed by Event Action settings or by direction of Image Video™ Protocol external input. **Note:** The Enable control inserts or removes borders for **only** the PiP(s) selected using the Configure Select drop-down above.

Border set for 0
(all images touch with no border)

Border set for 10
(a 10-pixel border is added)

Note: PiP border colors are typically controlled in an automated manner using GPI coding or IP automation. However, the border colors of each PiP can be set for static manual user control using forced settings, as described in Event Actions Setup Controls (p. 3-49).

Table 3-1 BBG-1070-QS Function Menu List — continued

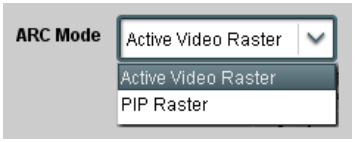
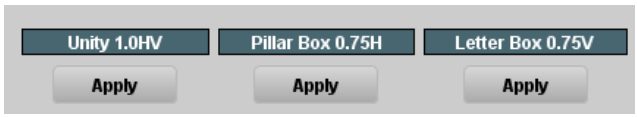
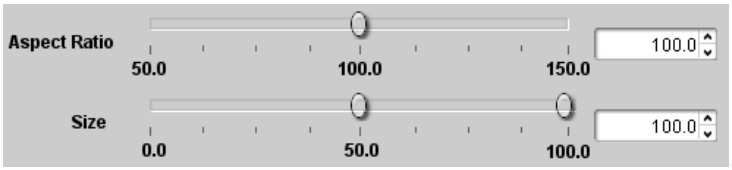
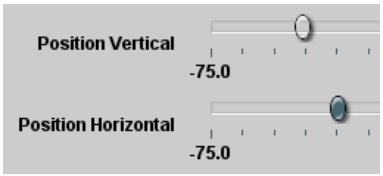
PIP ARC/Borders	(continued)
• **PiP ARC Mode Select** 	ARC Mode select allows the ARC controls to either use the aspect ratio defined by the incoming PiP video to serve as the referenced aspect ratio for other ARC controls, or to use a custom-sized aspect ratio PiP raster as the referenced aspect ratio. • **Active Video Raster** selection sets ARC action to use the incoming PiP video as the referenced aspecting (e.g., with a 16:9 input, setting ARC to Unity 1.0 HV results in a PiP with a 16:9 aspect ratio). • **PiP Raster** selection ARC action to use a custom-configured aspect ratio to serve as the referenced aspecting. PiP Raster selection can accommodate use cases where non-standard aspect ratios are desired even with image stretching or collapsing.
• **Standard Preset Template Aspect Ratio Conversion Selectors** 	Selects between the standard preset Aspect Ratio Conversions (ARC) shown below.
• **User-defined Aspect Ratio Controls** 	**Aspect Ratio Horizontal** and **Aspect Ratio Vertical** controls adjust horizontal and vertical zoom percentage. Settings less than 100% provide zoom-out; settings greater than 100% provide zoom-in. (50% to 150% range in 0.1% steps; null = 100.0) **Aspect Ratio** control applies a custom ARC with scaling reflecting the division of the aspect ratio (e.g., "50%" setting is equivalent to 2H:4V, or 2 divided by 4). **Size** control provides a proportional scaling of the PiP Image within the PiP area, maintaining whatever aspect ratio is in effect.
• **Within-PiP Positioning Controls** 	Where ARC settings result in an image smaller than the PiP active area, allows the image to be vertically and horizontally positioned within the PiP area boundaries. (-75% to 75% range in 0.1% steps) **Note:** This control affects only image positioning within the PiP image area cell. It will not move an image to an area outside the currently-defined PiP area cell.

Table 3-1 BBG-1070-QS Function Menu List — continued

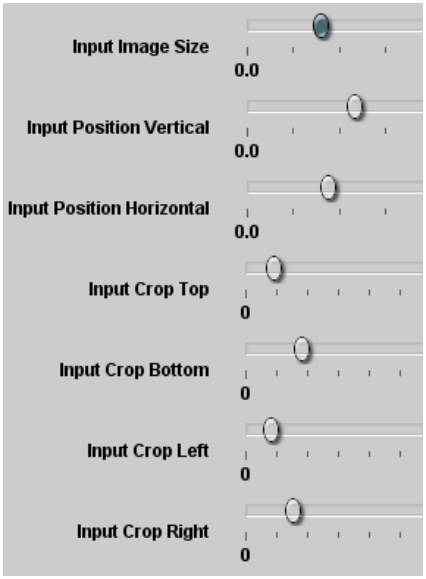
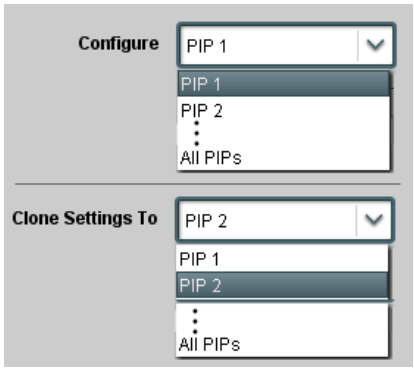
PIP ARC/Borders	**(continued)**
• Input PiP Video Size/Position Controls 	The controls shown here allow manipulating the input scaling and positioning of the selected PiP image before it is processed by the image area ARC. **Note:** This control affects only image positioning within the PiP image area cell. It will not move an image to an area outside the currently-defined PiP area cell.
Tally Lamps	Provides controls for each PiP to insert tally indicator “lamps” as overlays into the output video.
Note: • Tally lamp activation (ON/OFF and color control) is set using IP automation, or other external actions such as GPI (see Event Actions Setup Controls (p. 3-49) for setting up tally lamp control). The controls here enable lamp overlay insertion, and set size and position attributes. These controls do not control tally activation. • Identical independent controls are provided for a **Tally Lamp 1** and **Tally Lamp 2** tally lamps. Therefore, only the **Tally Lamp 1** controls are shown here.	
• PiP Configure Select/Clone 	Individually selects any of the five PiP inputs to be selected for tally insertion edits (as described below). Allows cloning settings to other PiPs. **Note:** For multi-unit setup using Cascade Config mode/setup, Clone Settings **from any** of the units in the chain can be cloned **to any** unit in the chain (i.e., **all** units in the chain appear in the **Clone Settings From** and **Clone Settings To** drop-downs). See Cascade Config Setup Controls (p. 3-41) for more information.

Table 3-1 BBG-1070-QS Function Menu List — continued

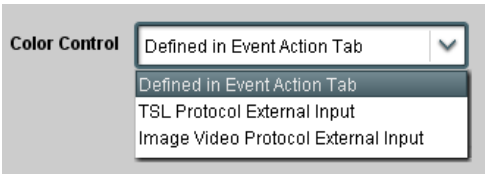
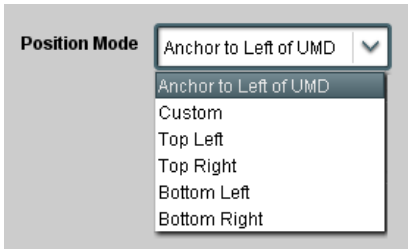
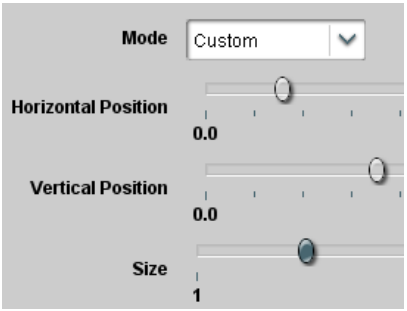
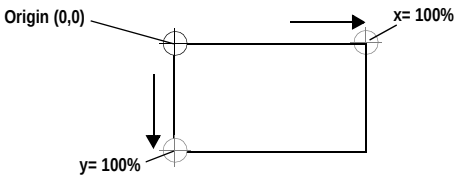
Tally Lamps	(continued)
• **Tally Insertion Select** 	Enables or disables lamp insertion overlay for selected PiP(s).
• **Lamp Color Control** 	Provides control for setting selected tally lamp “illuminated” color as directed by the control inputs shown.
• **Tally Position Select** 	Sets the location of the tally lamp as anchored to UMD, custom, or one of the positions shown here. (When Custom is selected, tally lamp position and size is configured using the controls described below.) **Note:** Tally Lamp 1 has anchored position Left of UMD (and is intended for left placement). Tally Lamp 2 has anchored position Right of UMD (and is intended for right placement).
• **Tally Custom Sizing/Position Controls** 	Where Custom is selected, allows tally lamp to be positioned anywhere in the image area of the respective PiP. **Horizontal** and **Vertical Position** controls set the origin point for the tally lamp overlay. 

Table 3-1 BBG-1070-QS Function Menu List — continued

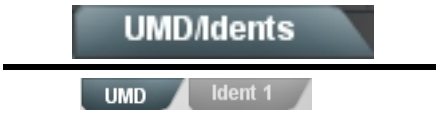
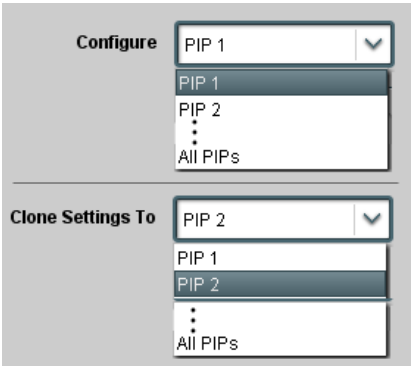
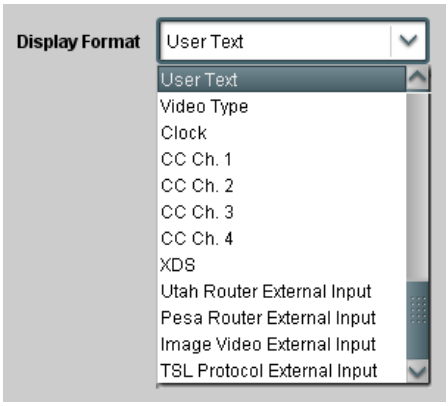
	Provides controls for each PiP to insert UMD text, user identification text, and timecode burn-in. Also allows setting insertion rules and text attributes such as size and color.
• PiP Configure Select/Clone 	Individually selects any of the five PiP inputs to be selected for UMD text insertion edits (as described below). Allows cloning settings to other PiPs. **Note:** For multi-unit setup using Cascade Config mode/setup, Clone Settings **from any** of the units in the chain can be cloned **to any** unit in the chain (i.e., **all** units in the chain appear in the **Clone Settings From** and **Clone Settings To** drop-downs). See Cascade Config Setup Controls (p. 3-41) for more information.
• UMD Insertion Select 	Selects the rules for UMD overlay insertion into the PiP area.
• UMD Text Type (Format) Select 	Selects the type of data to be displayed as UMD 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 respective PiP input. • **Clock** inserts a wall-clock time overlay (see Clock (Wall-Clock Time/ LTC) Controls (p. 3-56) for setting the wall-clock time clock feature). • **CC Ch 1** thru **XDS** insert the selected closed-captioning related text from the video associated with the correlated PiP input video. • **Utah Router External Input** thru **TSL Protocol External Input** insert text from the external router source. **Note:** UMD Text Character/Background Attributes controls and Text/ Background Positioning controls described below are locked out when closed captioning is selected for burn-in text. Text positioning, size, and other attributes are dictated within the closed captioning message; text displayed here follows the externally dictated attributes.

Table 3-1 BBG-1070-QS Function Menu List — continued

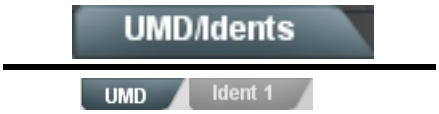
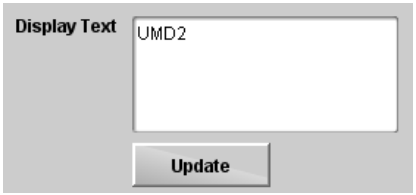
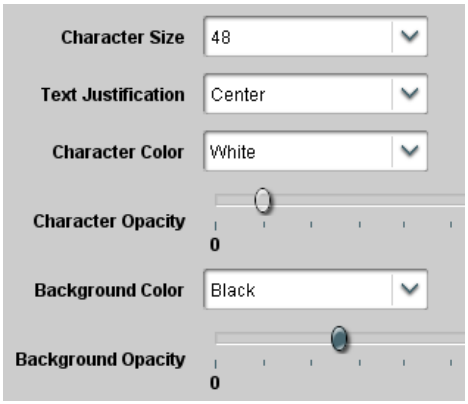
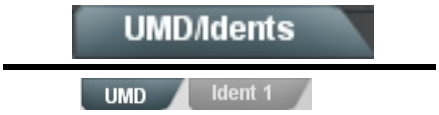
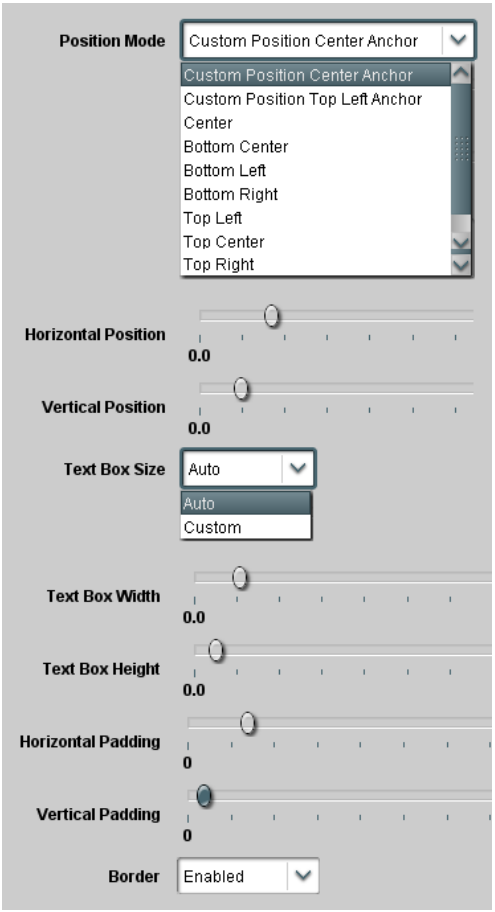
	**(continued)**
• **UMD Text Entry Field** 	Dialog entry box that allows entry of desired ident text string. Enter desired text as click **Update** when done to input the text string. **Note:** • All normal keyboard alphanumeric characters are supported. Not all ASCII special characters (Windows ALT+*nnnn*) are supported. • Up to 126 characters can be entered. • User custom text cannot be cloned and must be entered manually for each PiP UMD and/or Ident field.
Note: The sizing/positioning controls below for text and background have an interrelation where a background shading box can automatically track with text size/position and vice-versa as described below.	
• **UMD Text Character/Background Attributes Controls** 	Provides independent controls for setting the color and opacity of the UMD text and its background. • **Character Size** drop-downs set text size (in pixels). • **Text Justification** selects from left, center, or right-aligned text. • **Character** and **Background Color** drop-downs select text and background colors from various independent choices. • **Opacity** controls set text or background opacity from 0% (least opacity) to 100% (full opacity).

Table 3-1 BBG-1070-QS Function Menu List — continued



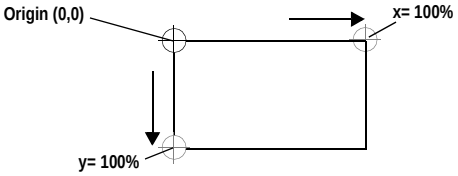
(continued)

• Text/Background Positioning Controls



• Using the **Position Mode** drop-down, UMD text and its background can be positioned using template choices (as shown) or can use the Custom choices which provide basic positioning which can then be further manipulated as described below.

• When Custom is selected, the **Horizontal** and **Vertical Position** controls allow fine adjustment of the text/background positioning.



• **Text Box Size** selects from **Auto** (in which the box size tracks with the configured text size) and **Custom** (in which the box size is then set using the **Text Box Width** and **Height** controls.

• **Horizontal** and **Vertical Padding** add padding (“white space”) within the box and its text.

• **Border** enables/disables a border around whatever box size is present. (The border color tracks with whatever the text color is set to.)

Table 3-1 BBG-1070-QS Function Menu List — continued

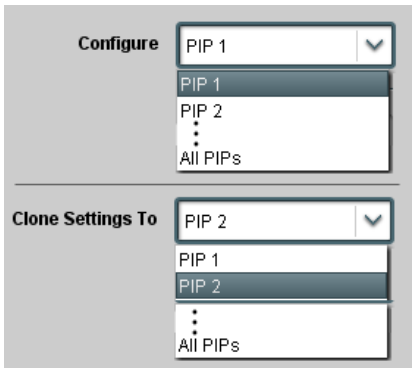
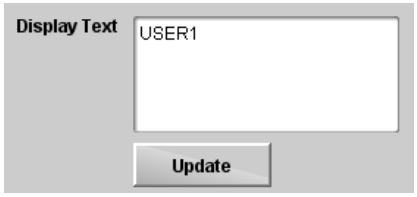
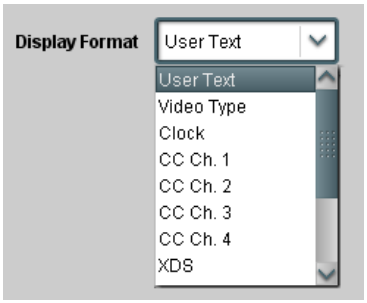
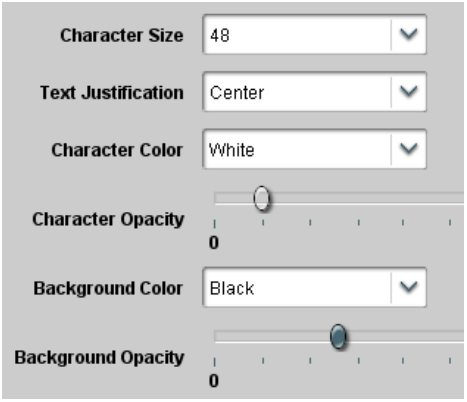
	Provides controls for each PiP to insert identifying active-video area burn-in text, and set insertion rules and text attributes such as size and color.
Note: Identical independent controls are provided for additional ident text insertion **Ident 2**. Therefore, only the **Ident 1** controls are shown here.	
• Ident Insertion Select 	Selects the rules for ident text overlay insertion into the PiP area.
• PiP Configure Select/Clone 	Individually selects any of the five PiP inputs to be selected for Ident text insertion edits (as described below). Allows cloning settings to other PiPs.
• 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. Not all ASCII special characters (Windows ALT+*nnnn*) are supported. • Up to 126 characters can be entered. • User custom text cannot be cloned and must be entered manually for each PiP UMD and/or Ident field.
• Text Type (Format) Select 	Selects the type of data to be displayed as UMD 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 respective PiP input. • **Clock** inserts a wall-clock time overlay (see Clock (Wall-Clock Time/ LTC) Controls (p. 3-56) for setting the wall-clock time clock feature). • **CC Ch 1** thru **XDS** insert the selected closed-captioning related text from the video associated with the correlated PiP input video. **Note:** Text Character/Background Attributes controls and Text/ Background Positioning controls described below are locked out when closed captioning is selected for burn-in text. Text positioning, size, and other attributes are dictated within the closed captioning message; text displayed here follows the externally dictated attributes.

Table 3-1 BBG-1070-QS Function Menu List — continued

(continued)

Note: The sizing/positioning controls below for text and background have an interrelation where a background shading box can automatically track with text size/position and vice-versa as described below.

- **Text Character/Background Attributes Controls**



Provides independent controls for setting the color and opacity of the ident text and its background.

- **Character Size** drop-downs set text size (in pixels).
- **Text Justification** selects from left, center, or right-aligned text.
- **Character** and **Background Color** drop-downs select text and background colors from various independent choices.
- **Opacity** controls set text or background opacity from 0% (least opacity) to 100% (full opacity).

Using both **Ident 1** and **Ident 2** provides enhanced flexibility in burn-in identification.

In this example, **Ident 1** is being used to display user text, and **Ident 2** is being used to display PiP input video format

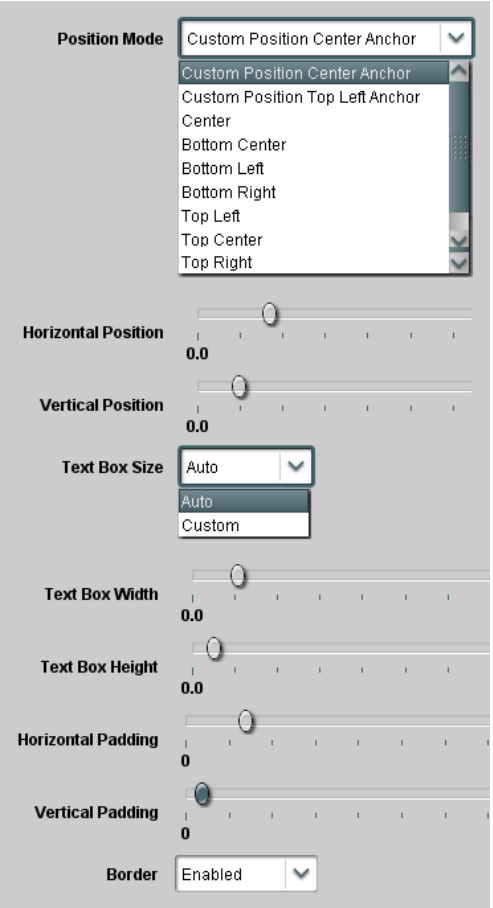
Ident 1 set to display user text (in this example, “USER 1”)

Ident 2 set to display video format (in this example, PiP input with 1080i_5994)

Table 3-1 BBG-1070-QS Function Menu List — continued

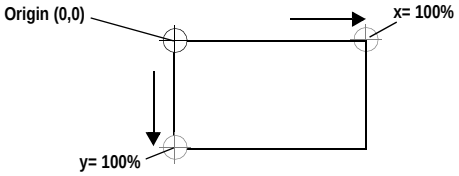
(continued)

• Text/Background Positioning Controls



• Using the **Position Mode** drop-down, ident text and its background can be positioned using template choices (as shown) or can use the Custom choices which provide basic positioning which can then be further manipulated as described below.

• When Custom is selected, the **Horizontal** and **Vertical Position** controls allow fine adjustment of the text/background positioning.



• **Text Box Size** selects from **Auto** (in which the box size tracks with the configured text size) and **Custom** (in which the box size is then set using the **Text Box Width** and **Height** controls.

• **Horizontal** and **Vertical Padding** add padding (“white space”) within the box and its text.

• **Border** enables/disables a border around whatever box size is present. (The border color tracks with whatever the text color is set to.)

Table 3-1 BBG-1070-QS Function Menu List — continued

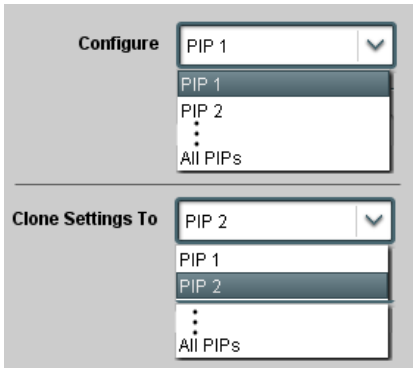
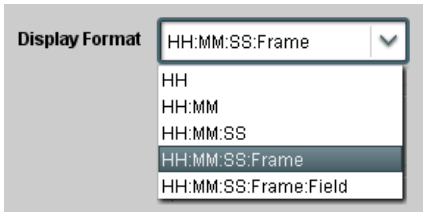
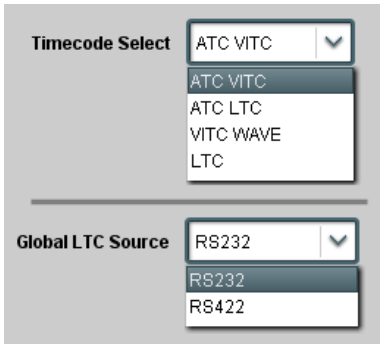
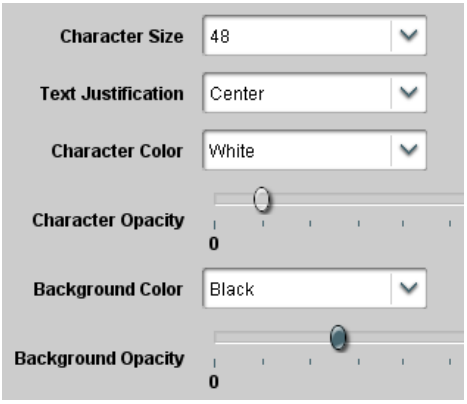
	Provides controls for each PiP to insert active-video area timecode burn-in, and set insertion rules and attributes such as size and color.
Note: Timecode character burn-in is always the embedded timecode associated with the PiP (i.e., PiP 1 Timecode Burn uses only the timecode value embedded on PiP 1 input video).	
• **PiP Configure Select/Clone** 	Individually selects any of the five PiP inputs to be selected for Timecode insertion edits (as described below). Allows cloning settings to other PiPs. **Note:** For multi-unit setup using Cascade Config mode/setup, Clone Settings **from any** of the units in the chain can be cloned **to any** unit in the chain (i.e., **all** units in the chain appear in the **Clone Settings From** and **Clone Settings To** drop-downs). See Cascade Config Setup Controls (p. 3-41) for more information.
• **Timecode Insertion Select** 	Selects the rules for timecode overlay insertion into the PiP area.
• **Timecode Format Display Select** 	Selects the format of timecode string burn-in overlay insertion from choices shown.
• **Timecode Input Select** 	• For the selected PiP and its input video, **Timecode Select** filters the timecode format choice to be used and burned in from the following choices: • **ATC_VITC** – SD or HD packet-based ATC_VITC timecode • **ATC_LTC** – HD packet-based ATC_LTC timecode • **VITC WAVE**– SD “waveform-based” VITC timecode (SD-SDI or CVBS) • **LTC** – externally-sourced LTC timecode not integrated within SDI or CVBS video • **Global LTC Source** selects from RS232 or RS422 external timecode source when **LTC** is selected above.

Table 3-1 BBG-1070-QS Function Menu List — continued

(continued)

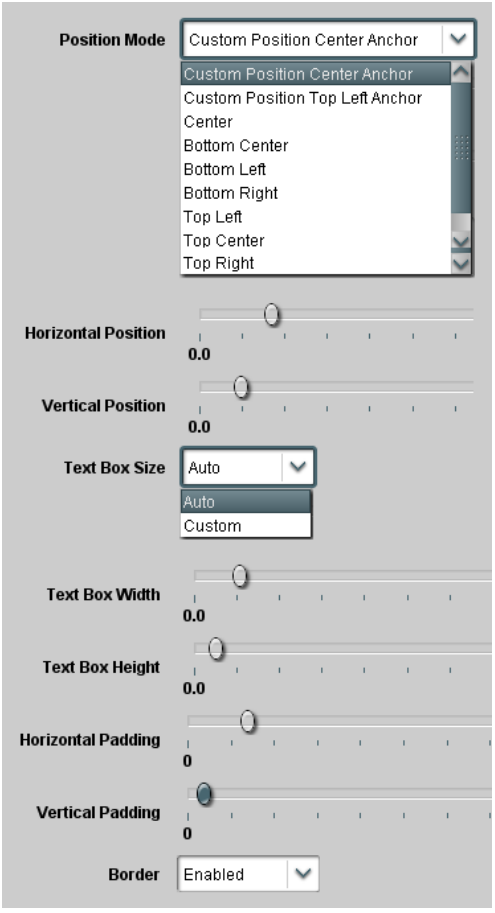
- **Text Character/Background Attributes Controls**



Provides independent controls for setting the color and opacity of the ident text and its background.

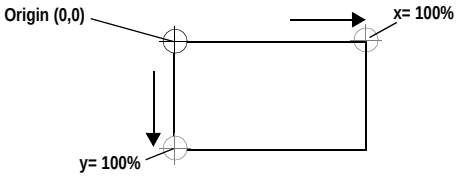
- **Character Size** drop-downs set text size (in pixels).
- **Text Justification** selects from left, center, or right-aligned text.
- **Character** and **Background Color** drop-downs select text and background colors from various independent choices.
- **Opacity** controls set text or background opacity from 0% (least opacity) to 100% (full opacity).

- **Text/Background Positioning Controls**



- Using the **Position Mode** drop-down, ident text and its background can be positioned using template choices (as shown) or can use the Custom choices which provide basic positioning which can then be further manipulated as described below.

- When Custom is selected, the **Horizontal** and **Vertical Position** controls allow fine adjustment of the text/background positioning.



- **Text Box Size** selects from **Auto** (in which the box size tracks with the configured text size) and **Custom** (in which the box size is then set using the **Text Box Width** and **Height** controls.

- **Horizontal** and **Vertical Padding** add padding (“white space”) within the box and its text.

- **Border** enables/disables a border around whatever box size is present. (The border color tracks with whatever the text color is set to.)

Table 3-1 BBG-1070-QS Function Menu List — continued

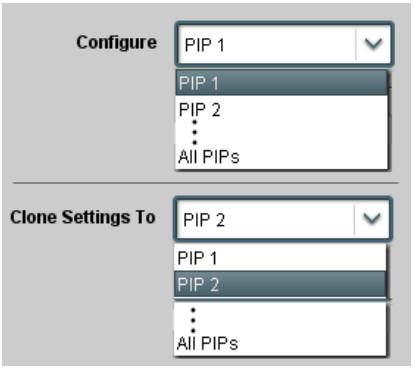
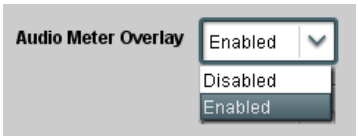
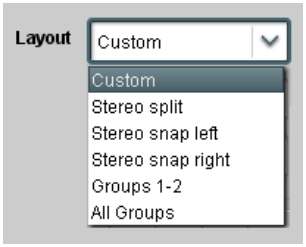
Audio Meter Overlay	Provides controls for each PiP to insert active-video area audio meters (bars), and set insertion rules and attributes such as layout, size and position.
Note: Audio meters are correlated with the embedded audio associated with the PiP input video. Each PiP can be set to display audio meters as desired.	
• PiP Configure Select/Clone 	Individually selects any of the five PiP inputs to be selected for Audio Meter insertion edits (as described below). Allows cloning settings to other PiPs. **Note:** For multi-unit setup using Cascade Config mode/setup, Clone Settings **from any** of the units in the chain can be cloned **to any** unit in the chain (i.e., **all** units in the chain appear in the **Clone Settings From** and **Clone Settings To** drop-downs). See Cascade Config Setup Controls (p. 3-41) for more information.
• Meter Insertion Enable/Disable 	Selects the rules for audio meters overlay insertion into the selected PiP area(s).
• Layout Select 	Selects from several preset layout templates and custom from the choices shown and depicted below. **Note:** Stereo selections are always correlated to embedded channels 1 and 2.

Table 3-1 BBG-1070-QS Function Menu List — continued

Audio Meter Overlay	(continued)

Example Meter Layouts

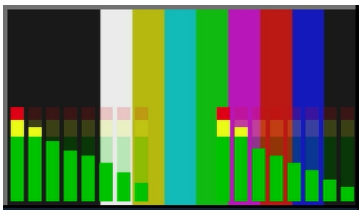
Stereo snap left

Stereo snap right

Stereo split

Groups 1-2

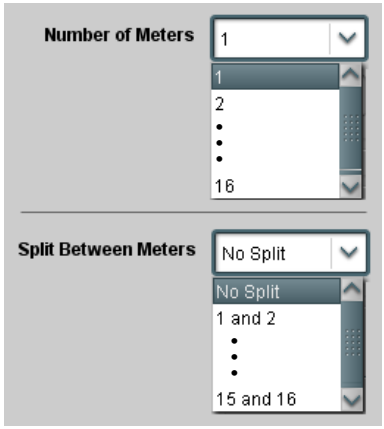
All Groups



Custom

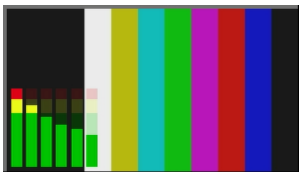
In this example, ch 1-4 on left, and ch 5-6 on right; 6 meters total

- **Number of Meters / Split Between Meters / Position (Custom Mode only)**



Where **Custom** mode is selected, allows for custom number of meter channels displayed, as well as a split between meters (if desired) which can be set between any pair.

Split Width controls sets the space between the space between the division set using the **Split Between Meters** control.



Split Width set at minimum (no split)

Split Width set at maximum (split pushes 2nd pair flush right)

Position controls raise the meter base when the control setting is increased, and move the display as a unit left or right.

Note: Where custom channel number complement is configured, channel correlation is always contiguous assignments starting at embedded channel 1.

Table 3-1 BBG-1070-QS Function Menu List — continued

Audio Meter Overlay	(continued)
• **Meter Width Control** 	Sets the relative height of the audio bars. **Width** set at middle **Width** set at less
• **Meter Height Control** 	Sets the relative height of the audio bars. **Height** set at middle **Height** set at less
• **Meter Opacity Control** 	Sets the relative opacity of the audio bars. **Opacity** set at middle **Opacity** set at less

Table 3-1 BBG-1070-QS Function Menu List — continued

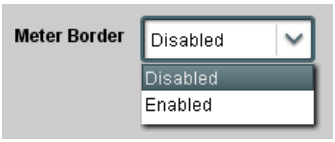
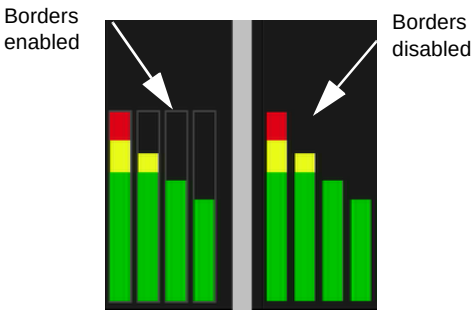
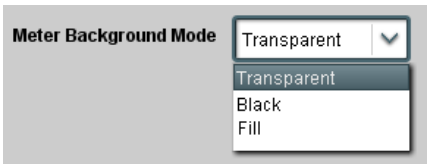
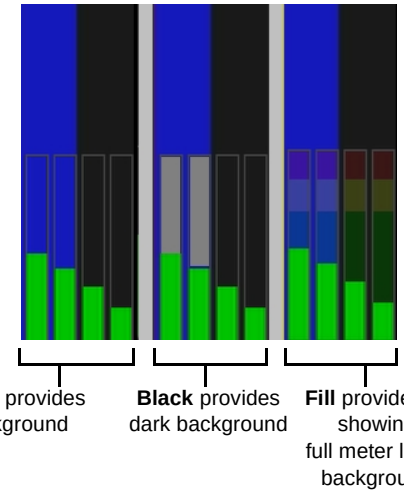
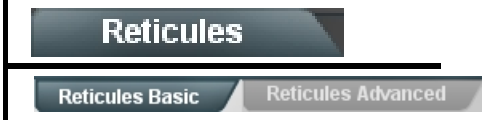
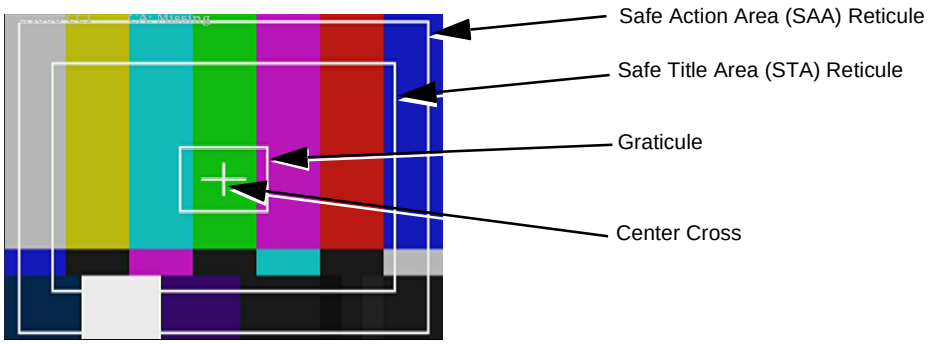
Audio Meter Overlay	(continued)
• **Meter Borders Select** 	Enables or disables limit borders surrounding each audio bar. 
• **Meter Brightness Control** 	Adjusts relative brightness of audio meter bars display.
• **Meter Background Select** 	Provides choice of three background themes for each meter bar. 

Table 3-1 BBG-1070-QS Function Menu List — continued

<table>
<tr><td> 
</td><td>Provides controls for each PiP for Safe Action and/or Safe Title overlays and other static reticule markers to be added to the output video image.</td></tr>
<tr><td colspan="2">Typical Reticule/Overlay Marker Insertions
The BBG-1070-QS allows any combination of the reticule/overlay markers to be applied to the output video. Sizing and other characteristics for each type of marker can be set as described below.
 

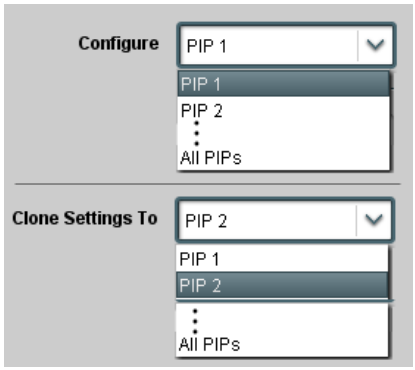
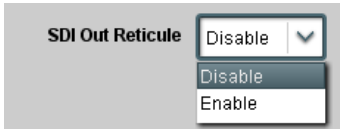
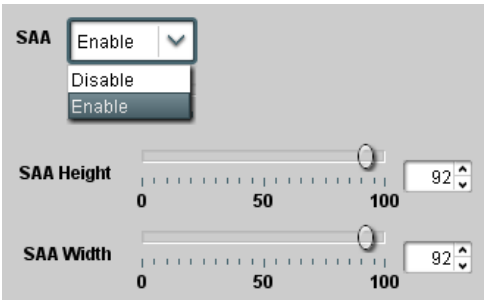
Note: Multiple overlay markers described below can be simultaneously enabled as desired.</td></tr>
<tr><td>• PiP Configure Select/Clone
 
</td><td>Individually selects any of the five PiP inputs to be selected for Reticule insertion edits (as described below). Allows cloning settings to other PiPs.
Note: For multi-unit setup using Cascade Config mode/setup, Clone Settings from any of the units in the chain can be cloned to any unit in the chain (i.e., all units in the chain appear in the Clone Settings From and Clone Settings To drop-downs). See Cascade Config Setup Controls (p. 3-41) for more information.</td></tr>
<tr><td>• Insertion Master Enable/Disable
 
</td><td>For each PiP, provides master reticule enable/disable for any or all reticule(s) inserted for each PiP.
• When enabled, any combination of reticules or other markers described below can be inserted.
• When disabled, insertion of all reticules or other markers is disabled.</td></tr>
</table>

Table 3-1 BBG-1070-QS Function Menu List — continued

(continued)

• Safe Action Area (SAA) Controls

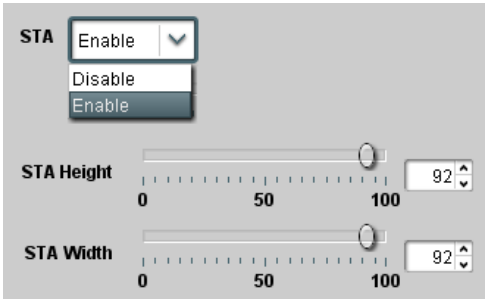


• **SAA** provides enable/disable of safe action area graticule insertion.

• **SAA Height** and **SAA Width** control height and width of insertion (from 0% to 100% of 4:3 outputted image area).

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

• Safe Title Area (STA) Controls



• **STA** provides enable/disable of safe title area graticule insertion.

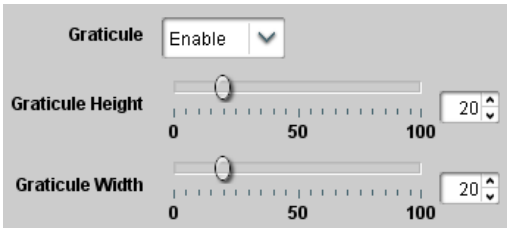
• **STA Height** and **STA Width** control height and width of insertion (from 0% to 100% of 4:3 outputted image area).

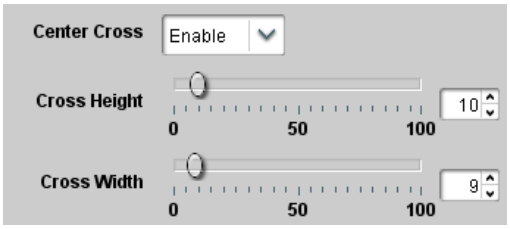
• Overlay Color Controls

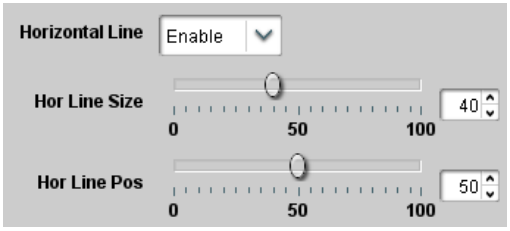
• **Overlay Color** selects from white or black colors.

• **Thickness** sets the line thickness of each reticule element.

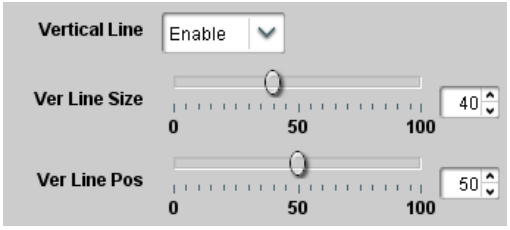
Table 3-1 BBG-1070-QS Function Menu List — continued

<table>
<tr><td>Reticules
ticules Basic | Reticules Advanced</td><td>Provides controls for each PiP for insertion and sizing controls for custom graticules and other markers. Also provides NTSC legacy 4:3 master reticule sizing.</td></tr>
<tr><td colspan="2">Note: Color attributes of markers described below are set using the master Overlay Color Controls described on the previous page.</td></tr>
<tr><td>• Graticule Controls
 
</td><td>• Graticule provides enable/disable of user graticule insertion.

• Graticule Height and Width control height and width of insertion (from 0% to 100% of 4:3 outputted image area).</td></tr>
<tr><td>• Center Cross Controls
 
</td><td>• Center Cross provides enable/disable of center cross insertion.

• Cross Height and Width control height of vertical line and width of horizontal line (from 0% to 100% of 4:3 outputted image area).</td></tr>
<tr><td>• Horizontal Line Controls
 
</td><td>• Horizontal Line provides enable/disable of horizontal line insertion.

• Horizontal Line Size controls the width of the horizontal line (from 0% to 100% of 4:3 outputted image area).

• Horizontal Line Pos controls the vertical positioning of the horizontal line (from 0% to 100% of 4:3 outputted image area).</td></tr>
<tr><td>• Vertical Line Controls
 
</td><td>• Vertical Line provides enable/disable of vertical line insertion.

• Vertical Line Size controls the height of the vertical line (from 0% to 100% of 4:3 outputted image area).

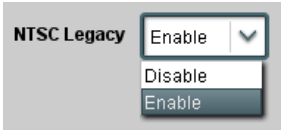
• Vertical Line Pos controls the horizontal positioning of the line (from 0% to 100% of 4:3 outputted image area).</td></tr>
<tr><td>• NTSC Legacy Reticule Fixed Control
 
</td><td>When set to enable, provides fixed-size safe action area 4:3 reticule suited for CRT-based displays.</td></tr>
</table>

Table 3-1 BBG-1070-QS Function Menu List — continued

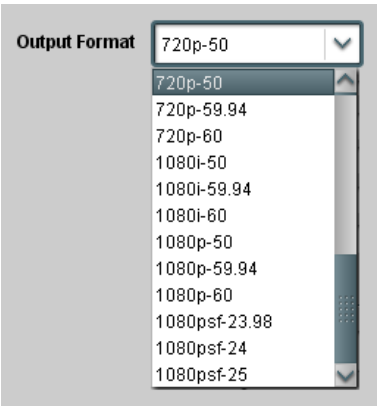
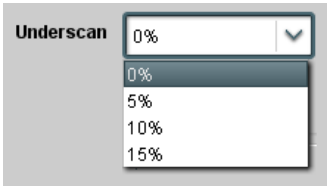
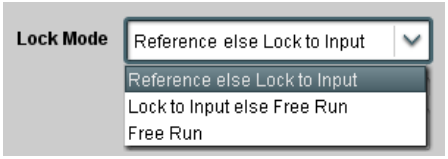
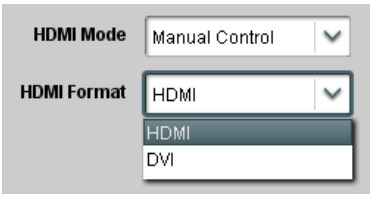
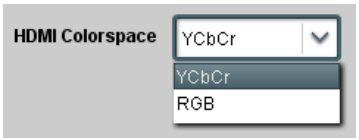
Output Format	Provides controls to set merged split output format/ conditioning and global ref lock mode. Also provides settings to force an HDMI or DVI output suitable for direct connection to monitors using a DVI input in case the connection is not detected by the monitor. Also provides color mode controls to match HDMI/DVI output to the color space of the monitor.
• **Output Format Selector** 	Provides conversions to formats as shown. **Note:** Although drop-down and unit will allow output video raster/rate choices unrelated to the input rates (for example, PAL 50Hz rate for NTSC 59.94Hz input rates), cross-rate conversion choices should not be used for critical applications (frames will be dropped when performing such conversions).
• **Underscan Select** 	Provides underscanning to reduce the merged output raster size by choices shown.
• **16x10 Compensation Select** 	Provides compensating rescaling to fully fit a native 16x10 aspect ratio image into the 16x9 aspect ratios used for various layouts.
• **Video Lock Mode Select** 	Selects lock to reference functions from the choices shown and described below. • **Free Run:** PiP inputs and output video is locked to the device internal clock. Output video is **not** locked to external reference. • **Lock to Reference:** PiP inputs and output video is locked to external looping reference, else SDI input A. • **Lock to Input A:** Uses Input A program video input video signal as the reference standard, else free-run. **Note:** Lock to reference provides the most stable operation, and is preferred where available. In this case, source video should also be locked to the same reference.

Table 3-1 BBG-1070-QS Function Menu List — continued

Output Format	(continued)
• **Frame Delay Control** 	When Framesync is enabled, specifies the smallest amount of latency delay (frames held in buffer) allowed by the frame sync. The frame sync will not output a frame unless the specified number of frames are captured in the buffer.
• **HDMI Mode Control** 	Sets HDMI/DVI output to use the connected monitor to inform BBG-1070-QS to automatically detect the monitor format, or to use manual (forced) control. Where the monitor may not be able to provide this handshake signal, it is recommended to use **Manual** mode and force the desired mode as described below.
• **HDMI/DVI Format Manual (Forced) Mode Control** 	When set to Manual Control, sets HDMI output as forced HDMI or DVI mode.
• **HDMI Colorspace Control** 	When set to Manual Control, forces output colorspace as either YCbCr or RGB.

Note: The HDMI output on this unit conforms with CEA-861D HDMI audio channel line-up specifications. As such, a swap between the C and LFE channels for the HDMI output is automatically performed.

If connecting to a device that does not meet CEA-861D HDMI, a Ch3 / Ch4 swap using the Output Audio Routing/Controls may be required to effect desired C - LFE line-up.

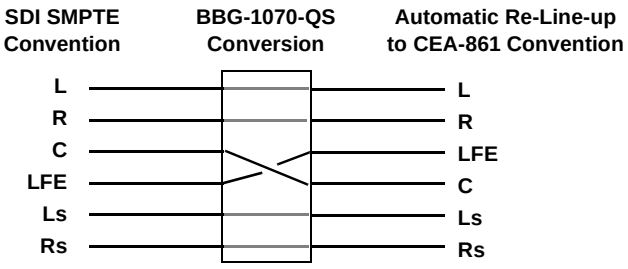


Table 3-1 BBG-1070-QS Function Menu List — continued

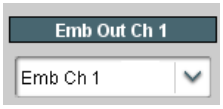
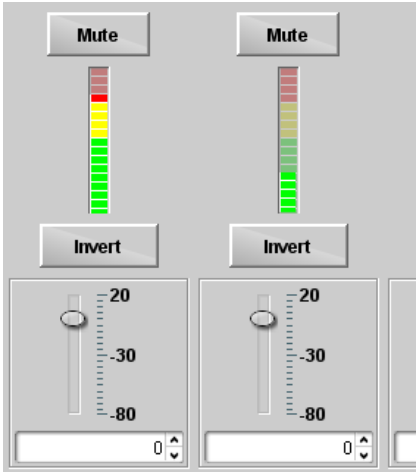
Output Audio Routing/Controls	Provides an audio crosspoint allowing the audio source selection for each embedded audio output channel. Also provides Gain, Phase Invert, and Muting controls and peak level meters for each output channel.
Note: • **Embedded Ch 2** thru **Embedded Ch 16** have controls identical to the **Source**, **Gain**, **Mute**, and **Invert** controls described here for **Embedded Ch 1**. Therefore, only the **Embedded Ch 1** controls are shown here. • For each channel, its source and destination should be considered and appropriately set. Unused destination channels should be set to the **Silence** selection.	
• **Embedded Audio Output Input Source** 	• **Audio Output Source** selects the four-group embedded audio to be embedded in the output embedded SDI audio (and HDMI Ch1 - Ch8 embedded audio). (In this example, PIP1 input audio is selected as the output four-group audio.) • **Audio Follow Full Screen** (when checked) automatically forwards audio associated with a full-screen video input whenever full screen is selected.
• **Group Enable/Disable Controls** 	Allows enable/disable of embedded audio groups 1 thru 4 on program video output to accommodate some legacy downstream systems that may not support all four embedded audio groups. **Note:** Changing the setting of this control will result in a noise burst in all groups. This control should not be manipulated when carrying on-air content.
• **Embedded Output Channel Source** 	Using the drop-down list, selects the audio input source to be embedded in the corresponding embedded output channel from the following choices: • Device **Audio Bus (Emb) Ch 1** thru **Ch 16** • Built-in Tone generators **Tone 1** thru **Tone 16** (all are -20 dBFS level; freq (Hz) in ascending order are 100, 200, 300, 400, 500, 600, 700, 800, 900, 1k, 2k, 4k, 6k, 8k, 12k, and 16k) • *Option* Audio **LTC**
• **Channel Mute/Phase Invert/Gain Controls and Peak Level Display** 	Provides **Mute** and phase **Invert** channel controls, as well as peak level meter for each output channel. (Meter shows level as affected by Level control.) **Gain** controls allow relative gain (in dB) control for the corresponding destination Embedded Audio Group channel. (-80 to +20 dB range in 1.0 dB steps; unity = 0 dB) **Note:** Although this unit can pass non-PCM data such as Dolby® E or AC-3, setting the gain control to any setting other than default 0 will corrupt Dolby data.

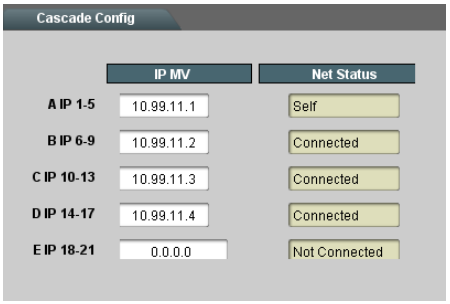
Table 3-1 BBG-1070-QS Function Menu List — continued

Cascade Config	Cascade Config (in conjunction with multi-unit network connection) provides cascade chain network-connected BBG-1070-QS units to communicate with each other and expose settings and attributes from all of the units within the chain. Each unit "sees" the other -QS units in the network chain connection, with access to PiP controls for all PiPs from any unit within the chain. The Cascade Config tab allows setting up the units in the cascade chain to communicate with each other.

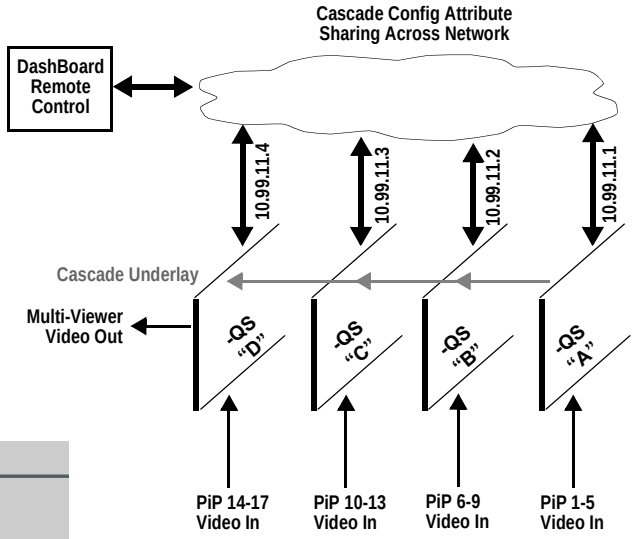
Note:
- Units within a cascade chain communicate via Ethernet using each unit's dedicated rear panel Ethernet port (DashBoard CAN bus is not used for this function).
- In Cascade Config mode, any control setting changes are saved for all units in the chain. However, to load a saved configuration from a Presets files to new of different units for a Cascade Config chain, a special procedure must be used to make certain all units in the chain receive the intended settings. See Loading Saved Presets to New or Different BBG-1070-QS Units (Cascade Config Usage) (p. 3-59) in Presets for instructions.
- If a global preset is to apply in some manner to all units in the chain, it is recommended to have all units in the chain set up as desired, and then save the preset on the **last** unit in the chain. This helps ensure that **all** saved states in each unit will be saved in an "umbrella" preset encompassing **all** units in the chain.

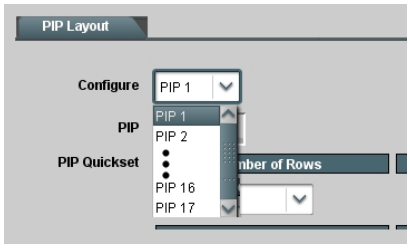
Cascade Config DashBoard tabs and multi-unit network connection allows cascade chain network-connected BBG-1070-QS units (BBG-1070-QS units "A" thru "D" in this example) to communicate with each other and centrally expose setup attributes of all of the units within the chain.

Cascade Config is designed to use the first unit as a full quint-split processor, with subsequent units in the chain taking in the cascade underlay as **In E** and additional PiP inputs as **In A** thru **In D**. In this example, a 17-input multiviewer is attained (four units providing 5+4+4+4 = 17 input channels).



BBG-1070-QS units within the chain (equipped with Ethernet-port rear modules) are connected to a shared network. This allows the units to "see" each other, with each unit exposing control attributes for **all** the units.





For each per-PiP control, the result is **all** PiPs within the chain being exposed, allowing settings to be performed from **any** of the units and cloned to any unit as desired. User presets can encompass all units in the chain and be invoked in a single action done at one unit.

Table 3-1 BBG-1070-QS Function Menu List — continued

Cascade Config	(continued)

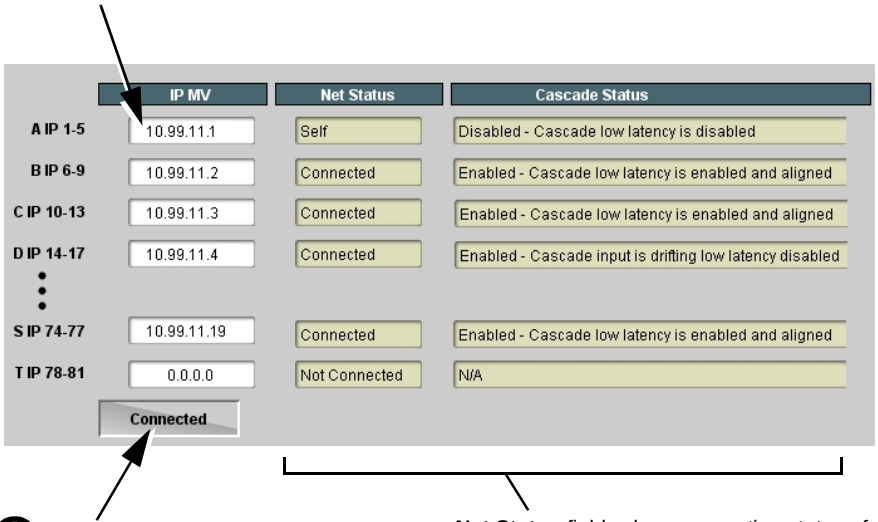
Cascade Configurator Network Setup

The configurator definer tool defines the BBG-1070-QS units within a particular cascade chain by unit IP address, and each unit's position within the multiviewer setup. The setup is based on BBG-1070-QS units being used with the first unit receiving 5 program video inputs, and subsequent cascade BBG-1070-QS units each receiving an upstream cascade underlay (on **PiP 5 In**) with 4 program video inputs being received on **PiP In 1** thru **PiP In 4** (in other words, as a **5 + 4*n*** matrix, with ***n*** being the number of downstream cascade units).

This allows multiviewer setups using up to 20 units (**A** thru **T** in the definer shown below) to provide an up to 81-split combined multiviewer image.

---

1. Assign each unit in the cascade chain a dedicated IP address (if not done so already). Working from the starting unit to each downstream cascade unit, enter the unit IP address in each **IP MV** field.



2. When done, click the **Connect** button. When all units enter are connected, button shows Connected.

Net Status fields show connection status of each entered unit.

- **Self** indicates unit that is currently being viewed in setup dialog.
- **Connected** indicates other unit that is defined in dialog .
- **Not Connected** indicates that unit IP hasn't been entered in **IP MV** row, or simply a blank MV definer row that isn't being used.
- **Connection Failed** indicates a unit that has IP entered is no longer connected (due to cabling issue or other network issue).

Cascade Status fields show cascade mode settings (Enabled or Dsiabled) and status for each defined unit in the chain (as shown in the example here, first unit in chain is not set for cascade since it uses all inputs as program video PiPs).

Note: When all units are connected, this pane is available in **all** defined units in the chain.

All BBG-1070-QS units (except for unit in first-unit row **A** position) **must** be set for **Cascade Mode**. This allows subsequent units to receive the PiP images from preceding units.

See Cascade Mode Select (p. 3-11) for details on using the cascade mode.

3. Set up PiP positioning, sizing, and attributes (UMD, Idents, tallies, audio bars etc.) as described in respective sections of this chapter. Once the definer described above is connected, these attributes for all units can be configured from any unit in the chain. See the example on the next page for an overview and tips on using Cascade Config.

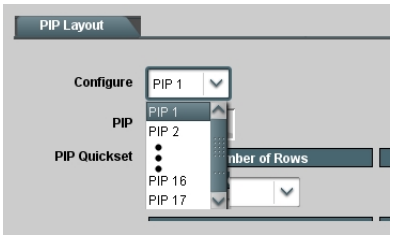
Table 3-1 BBG-1070-QS Function Menu List — continued

Cascade Config	**(continued)**

Cascade Configurator Example and Setup Tips

The following shows an example where a 17:1 multiviewer is furnished using Cascade Config with four BBG-1070-QS units forming a 4-unit chain (5+4+4+4 PiP inputs which provides a 17-PiP multiviewer).

A very important and clarifying aspect of using Cascade Config is when the units are cascade network defined (as described on the previous page) **the DashBoard UI simply combines all the discrete units as a single device**. A primary function of Cascade Config is to provide a global, centralized setup point for all units in the chain, thereby creating (from the UI perspective) a virtual single-device multiviewer.



As shown to the left, all DashBoard layout and attribute controls appear and function just like using the single-unit BBG-1070-QS. The only difference is now **all the PiPs can be accessed from a single point** (rather than going from unit-to-unit). In our example, the **PIP Layout** drop-down now has **Configure** definers for PiPs 1 thru 17 instead of just PiPs 1 thru 5 for a single, non-networked unit.

With Cascade Config, the only setup aspects that remain local to each unit in the chain are:

- **Input Routing** (each unit still needs its per-unit input sources defined)
- **Output Audio** (each unit needs to know whether to pass audio from an upstream unit, or use audio sourced from a local PiP input
- **Output Format** (Output format will likely be set consistent across all units in the chain. If a format change is needed for the final output, this is best accomplished by doing this on the last unit in the chain.)

Shown below is the example multiviewer setup described in this example. For this example, Idents are set as **PIP1** thru **PIP 17** for the 17 PiPs in the merged MV output. Also for example purposes, the parenthetical designations correlate to the unit **A** thru **D** per-unit PiP inputs that provide the 5+4+4+4 that result in the 17-PiP aggregate.

— Example continued on next page —

Table 3-1 BBG-1070-QS Function Menu List — continued

Cascade Config	(continued)

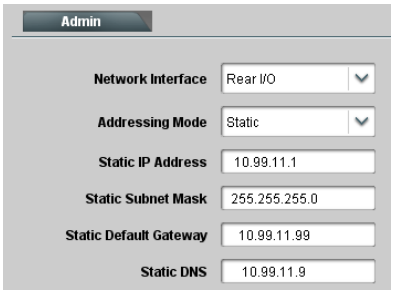
Cascade Configurator Example and Setup Tips (cont.)

1 First, all BBG-1070-QS units in the cascade chain need to be assigned dedicated IP addresses to be used in conjunction with the per-unit dedicated Ethernet RJ-45 port.

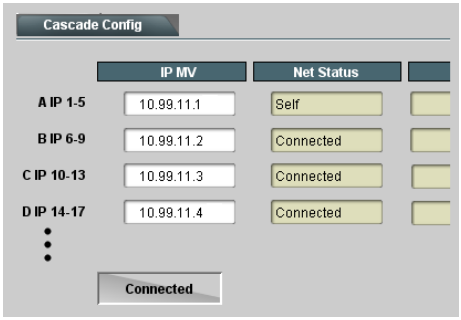
In the example here, four units (**A** thru **D** in the cascade chain) are using dedicated IP addresses **10.99.11.1** thru **10.99.11.4**, respectively. This provides for a 17-PiP multiviewer setup

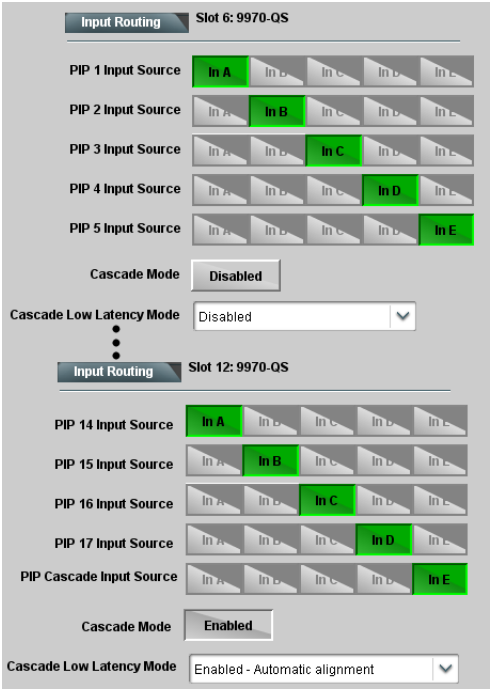
Unit A (10.99.11.1) PiP 1 thru 5
Unit B (10.99.11.2) PiP 6 thru 9
Unit C (10.99.11.3) PiP 11 thru 13
Unit D (10.99.11.4) PiP 14 thru 17

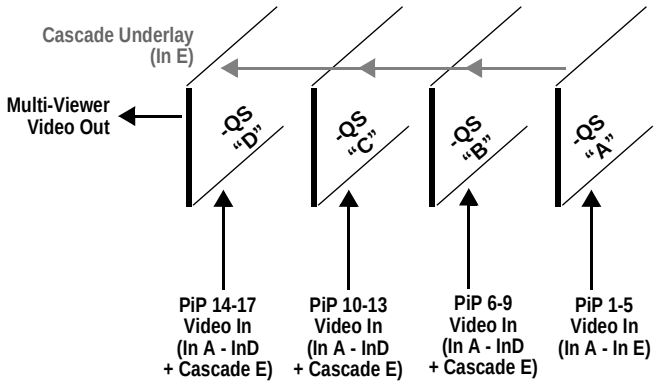
Total: PiPs 1 thru 17 on combined MV output



2 With the four units (A thru D comprising the chain) assigned dedicated IP addresses, the IP addresses of the four units are entered in the **A** thru **D** definer slots in Cascade Config page. When all unit IP's are entered, click **Connect**. The units are now connected in the Cascade mode.







3 On a per-unit basis, the physical routing of PiP sources to each unit's Source-to-PiP routing needs to be set up.

Shown here is the routing setup that applies the 17 PiP inputs to the respective inputs in the four-unit Cascade chain.

- The **first** unit in the chain (**Slot 6 Unit A** in the example) is set as a regular quint-split, with five discrete program inputs and Cascade Mode disabled (since this unit is not receiving a cascade underlay).
- **Subsequent downstream** units in the chain (**Unit B** thru **Unit D** in the example) are set as cascade, with four discrete program inputs per unit and Cascade Mode enabled (since these units receive a cascade underlay).

— Example continued on next page —

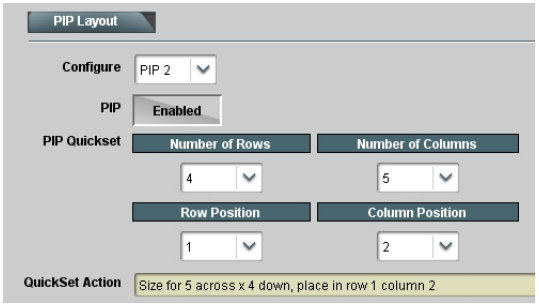
Table 3-1 BBG-1070-QS Function Menu List — continued

Cascade Config	**(continued)**

④ All of the PiP Layout, ARC/Borders, Tally, UMD/Idents, and other graphical attributes are under the cloning “umbrella” (i.e., attributes can be set up for a given PiP and then cloned across others as desired). Knowing the desired general layout, set up any PiP meeting your layout desires, and then clone and modify the settings to achieve the overall desired layout. The example below shows some examples of setting up a given PiP, and then cloning and “tweaking” the settings for another PiP.

Note: Refer to setup control sections (e.g., PIP ARC/Borders Controls, UMD/Identification Text Insertion Controls, etc.) for specific instructions on using the particular graphic tool.

In the example layout shown, knowing a layout with 4 rows and 5 columns is desired, the PiP Layout settings for any PiP can be set for 4x5 rows/columns as shown. In this example starting with PiP 2, the row 1 position and column 2 position is set and applied, and the PiP is sized accordingly (20x25 in this example).



Once this is done, this PiP is cloned across **all** PiPs to establish the baseline consistency across all PiPs. Then after this, the row/column positions for the other PiPs can be tweaked to place them as desired. Other attributes such as UMD/Idents and Tallies are then group cloned and then tweaked as desired.

Using the global 4x5 rows/columns layout, **PiP 2** is accordingly sized and set up to be positioned in Row Position 1 and Column Position 2. This baseline setting is cloned across all PiPs.

Using the global cloned settings from PiP 2, **PiP 9** is set up by using all cloned settings and simply tweaking the Row/Column positions to place it as desired.

In this example, the UMD/Idents are also cloned, with the only tweaks necessary being the ID values.

Note that **any** PiP settings can be accessed from **any** unit in the cascade chain.

Note: User custom text entered in UMD or Ident cells **must** be manually entered for each UMD and/or Ident cell. User custom text cannot be cloned from one PiP to another.

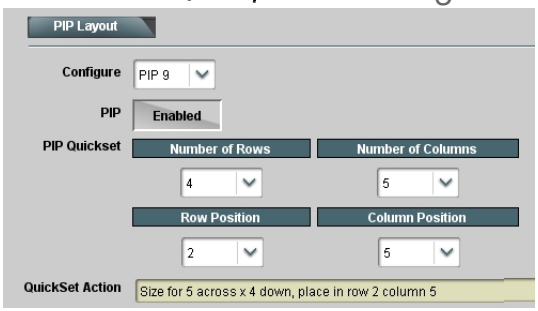


Table 3-1 BBG-1070-QS Function Menu List — continued

Provides controls for integrating Utah Scientific™ router (such as SC-4) IP communication with BBG-1070-QS to provide automated UMD and Ident text burn-in, independently for PiP IN A thru IN E input channels.

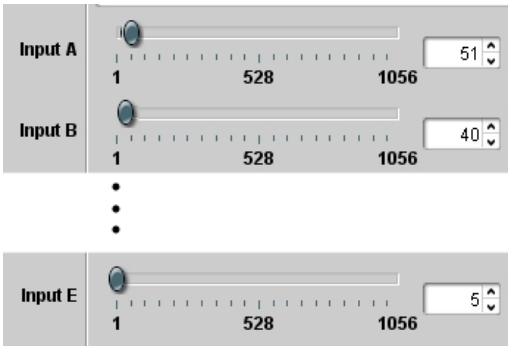
Note:
- Router address must be accessible to network used for BBG-1070-QS Ethernet port (as set using the unit Admin > Networking function (see pg. 3-61).
- When router access (fetch) is enabled, control of certain burn-in aspects is asserted by router control, with user manual control locked out.
- Utah routers (such as SC-4) are limited to UMD text assert only. This router cannot assert tally lamp activation states.
- The **PESA Router** sub-tab has controls and functions similar to those described below.

• Router Fetch Enable / Address Controls

Enables or disables Utah router command fetch and provides entry for Utah router address.

Note: When router access (fetch) is enabled, UMD text is asserted by Utah router commands. The **UMD > Display Format** control is locked to **External Input**, with user text entry or other UMD type selections locked out.

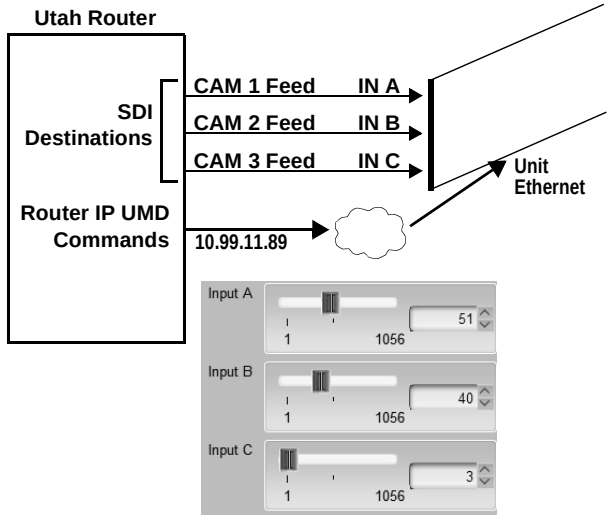
• Router Fetch Enable / Address Controls



Sets the router logical port-to-unit input correlation for up to 5 unit inputs (**IN A** thru **IN E**).

In the example below:

- Router logical port 51 is correlated to unit input A
- Router logical port 40 is correlated to unit input B
- Router logical port 5 is correlated to unit input E



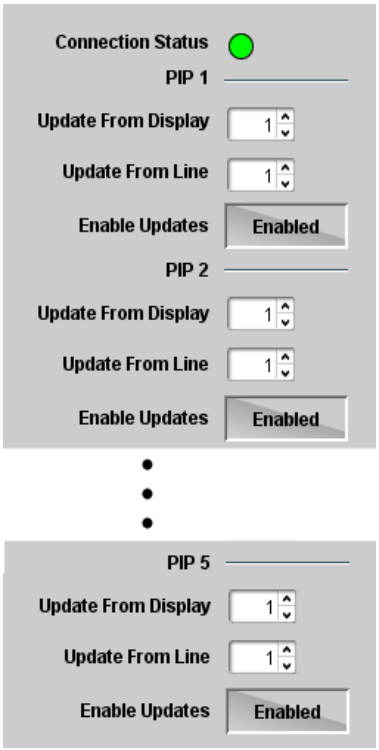
With the router destination commands for Input A thru Input C as shown here, router-enabled settings allow router to assert UMD text correlated to router destination outputs, and in turn, BBG-1070-QS inputs (in this example, router IP ports 51, 40, and 3 used for packet streams for IN A thru IN C, respectively).

As shown in the example, this asserts the “CAM 1” thru CAM 3” UMD text insertions for these three unit inputs.

Table 3-1 BBG-1070-QS Function Menu List — continued

Provides controls for integrating Image Video™ router IP communication with BBG-1070-QS to provide automated UMD and Tally burn-ins, independently for PiP 1 thru PiP 5.

• Router Enable Controls



Enables or disables Image Video router updates for each of the five PiPs.

• **Update from Display** asserts PiP tally lamp activation.

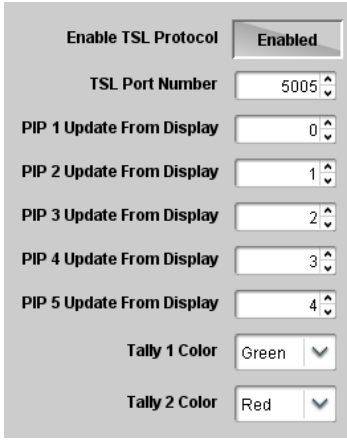
• **Update from Line** asserts UMD text.

Note: • The Image Video integration works on a PiP-by-PiP basic (rather than commands being tied to input channels).

• Image Video router/server holds BBG-1070-QS IP address to establish connection. Therefore, the Image Video address is not required here.

Provides controls for integrating TSL™ router IP communication with BBG-1070-QS to provide automated UMD and Tally burn-ins, independently for PiP 1 thru PiP 5.

• Router Enable/Correlate to PiP Controls



TSL router messages typically provide automated UMD text correlating to names used on the TSL control surface (for example, “CAM 1” for PiP1).

• **Enable TSL Protocol** enables and sets device to look for TSL messages.

• **TSL Port Number** is the logical port assigned for the TSL router.

• **PIP *n* Update From Display** correlates the TSL display number to the BBG-1070-QS PiP channel.

• **Tally 1 Color / Tally 2 Color** selects the “illumination” colors to be used when either Tally Lamp 1 or Tally Lamp 2 is activated.

Note: • The TSL integration works on a PiP-by-PiP basic (rather than commands being tied to device input channels).

• TSL router/server holds BBG-1070-QS IP address to establish connection. Therefore, the Image Video address is not required here.

Table 3-1 BBG-1070-QS Function Menu List — continued

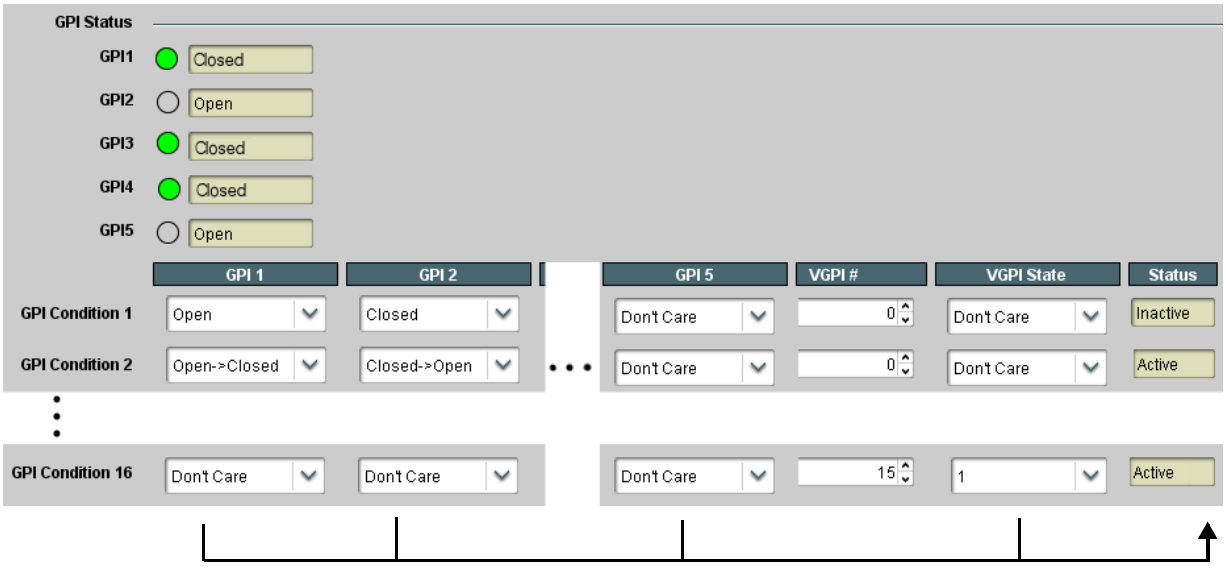
GPI Setup	Provides controls for setting up to 16 “virtual GPIs” using the up to five discrete GPI inputs. The virtual GPIs can in turn be used for attribute control such as tally lamp activation, borders, and ident text (in conjunction with the **Event Action** tab controls).

Up to five GPI inputs are available which can be used as direct or logic statement control inputs. Additionally, up to 256 VGPIs (virtual GPIs) can be received via certain automation system via the network connection.

In examples here, **GPI Condition 2** goes active when triggers defined as other than Don’t Care become true (in this case, the GPI 1 and GPI 2 2 conditions shown).

In the **GPI Condition 15** example shown here, the GPI inputs are not used (set to Don’t Care), while when **VGPI# 15** goes true, GPI Condition 15 becomes active.

GPI Condition 1 thru **GPI Condition 16** defined here are in turn used with the **Event Actions** page to provide tally, border, and other attributes control based off of GPI inputs received. (See Event Actions Setup Controls (p. 3-49) for instructions on setting up action triggering controls.)



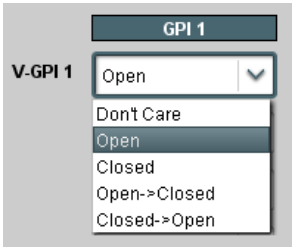
GPI 1 thru **GPI 4** definers have drop-down which allow setting the logic associated with the input:

Open = pullup HI

Closed = pulldown LO

Open->Closed = falling-edge trigger

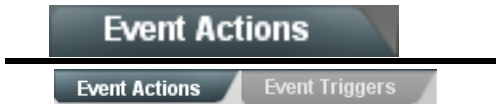
Closed->Open = rising-edge trigger



- Unused GPI inputs should be set to “Don’t Care”

Make certain GPI inputs are in accordance with GPI Inputs in Technical Specifications, Chapter 1. Introduction.

Table 3-1 BBG-1070-QS Function Menu List — continued



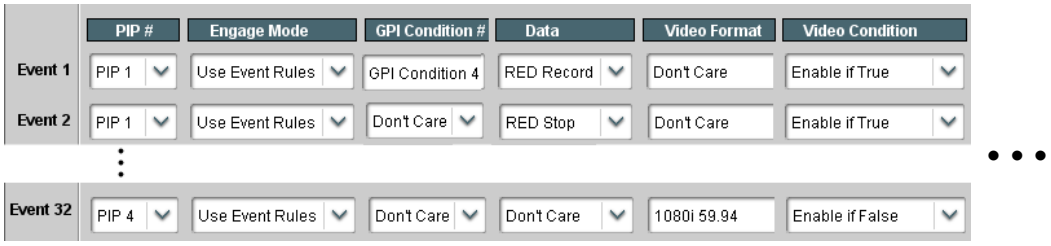
Provides controls for setting up attribute control such as tally lamp activation, borders, and ident text using GPI, video format, or other action triggers. Internal intelligent event triggers provide attribute control based off of detected signal conditions.

The Event Actions page allows defining up to 32 discrete events that can be used to control attributes (color, on/off states, and other visual cues) of tally, border, or other graphics in response to GPI, data, or video status conditions. This provides easily incorporated and flexible attributes control using internally assessed conditions or via integration with external IP assets.

Event Correlator Rows
Allows up to 32 discrete events to be defined and used in any combination for PiPs 1 thru 5

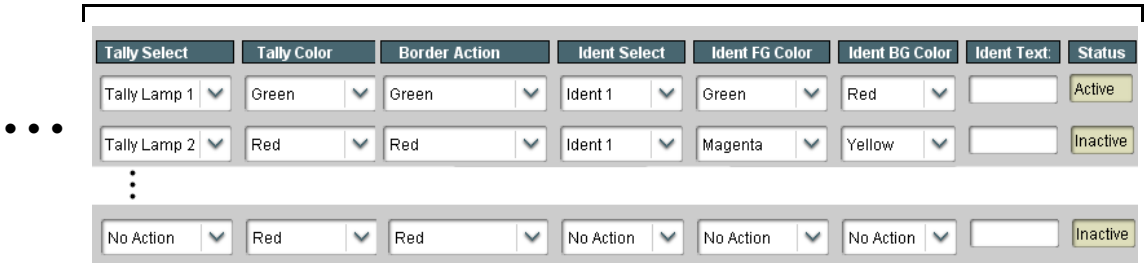
Event Trigger Select
Sets conditions or inputs that control attributes actions:

- **Engage Mode** tells row settings to be engaged upon defined rules being true, or by forcing the event. **Force Event** setting is useful for testing how the Action appears, or for manually setting an attribute without external triggers.
- **GPI Condition #** allows virtual GPI control to be used to trigger an Action (see GPI Setup Controls (p. 3-48) for info on GPI setup).
- **Data** allows camera metadata to be used to trigger an Action.
- **Video Format** allows received video format of the selected PiP to be used to trigger an Action.
- **Video Condition** allows triggering on true video format conditions, or triggering on false (inverse) video format conditions. This is useful in defining a trigger that invokes an action to indicate contrary formats.



Event Action Select
Sets the action to take place when a corresponding trigger is received:

- **Tally Select** allows selecting tally lamp 1 and/or 2 attribute actions to be applied when a trigger is true.
- **Tally Color** assigns a color to be applied to the selected lamp when a trigger is true.
- **Border Action** allows border color to be changed when a trigger is true.
- **Ident Select** selects fromUMD, Ident1, Ident2, Timecode, or No Action to be invoked when a trigger is true.
- **Ident FG (foreground) Color** and **BG (background) Color** allow text and/or background color changes to either Ident1 and/or Ident2 text insertions to be applied when a trigger is true.
- **Ident Text** allows alternative Ident text to be optionally asserted when a trigger is true.
  Note: Optional triggered ident text may persist even if condition is cleared. Ident **Update** button may need to be pressed to restore text as entered in Ident sub-tab.

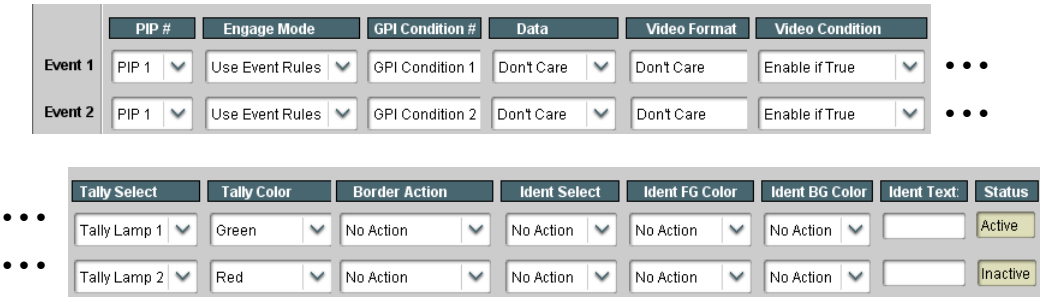


Note:
- Event Action conditions, when used in a combination and not set as "Don't Care" comprise an **AND** function. Make certain any conditions not to be considered are set to Don't Care. Similarly, if an attribute is not to be "touched" by the invoking of an event, make certain these actions are set to "No Action".
- Loss of true conditions does not disengage an event-based triggering. A new set of true conditions (or a separate row defined as the false of the condition) must be defined and then occur to transition from one event-based trigger to another.
- Any attribute can be manually set by defining an event, and then setting Engage Mode to **Force Event**. (If **Engage Mode** > **Force Event** is invoked for an event, event action will stay persistent unless forced by a new event action.)
- The **Event Actions** Event 1 thru 32 here are nested and confined to actions set on this subtab page. Events 1 thru 32 here are **not** related to, controlled, or activated by Event 1 thru 32 on the **Event Triggers** subtab page.

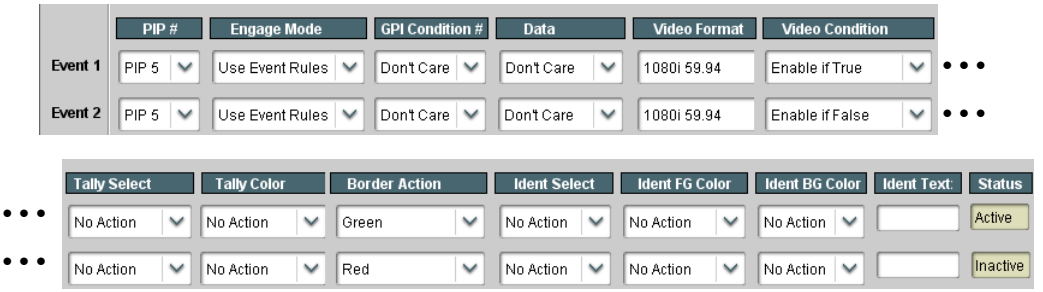
Table 3-1 BBG-1070-QS Function Menu List — continued

(continued)

Event Action Examples

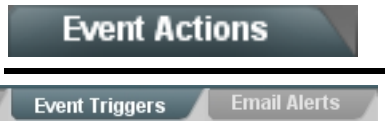


In this example, **GPI Condition 1** and **GPI Condition 2** are used to control the color and activation of the PiP 1 tally lamps.
- When **GPI Condition 1** is active as a trigger (Event 1) , the event action sets the tally lamp 1 to **green**.
- When **GPI Condition 2** is active (Event 2), the event action sets the tally lamp 1 to **red**.



In this example, **Video Format** is used as a trigger to put up a special border for PiP 5 if the PiP format is anything other than 1080i 5994.
- If 1080i 5994 is being received (Event 1), the border displays as **green**.
- If a format other than 1080i 5994 is received (comprising a false condition as set in Event 2), the previous action is overwritten with a new action to turn the border to **red**.

Table 3-1 BBG-1070-QS Function Menu List — continued



Provides event-based loading allowing a defined action to be automatically engaged upon various received signal status.

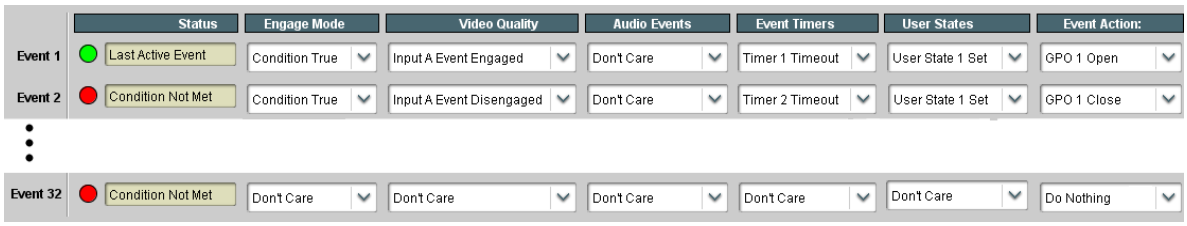
Event based actions are not passive and can result in very significant and unexpected card control and signal processing changes if not properly used. If event based actions are not to be used, make certain the **Event Based Loading** button is set to **Disabled**. The **Event Triggers** sub-page is intended primarily for invoking presets using GPI triggers. **Using the Event Actions sub-page for triggering on other conditions is recommended.**

Note: The **Event Triggers** Event 1 thru 32 here are nested and confined to events set on this subtab page. Events 1 thru 32 here are indepedent of, and **not** related to Event 1 thru 32 on the **Event Actions** subtab page (e.g., Event 1 becoming true here has no effect on Event 1 on the Event Actions subtab page).

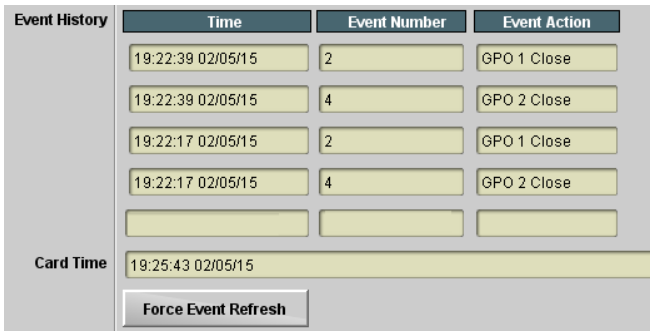
Event triggers allow a variety of event screening criteria, and in turn provide an Event Action "go to" in response to the detected event(s). For each screened criteria, categories can be set as "Don't Care" or set to specific criteria to broaden or concentrate on various areas of concern.

- The **Event based loading** button serves as a master enable/disable for the function.
- Go-to **Event Actions** can be "canned" (hard-coded) selections (such as GPIO triggers, timer controls (see Event Timer Setup (p. 3-53)), or automated E-mail alert to a respondent (see Email Alerts (p. 3-53) for setting up e-mail alerts).
- Each Event (**Event 1** thru **Event 32**) can be set to screen for any or several Definer criteria as shown in the example below. Up to 32 separate events can be defined.
- Event 1 thru Event 32 are arranged with Event 1 having the highest priority, descending down to Event 32. Where multiple event screening is enabled, lower-priority events are serviced first, with the highest-priority event being the final event serviced and last action taken as well as last item logged in the Event History (see below). This helps ensure that a lower-priority event does not mask detection of higher-priority event(s).
- The **Status** indicator and message shows the activation status of each Event. Green indicator means event is currently engaged.

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



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



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

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

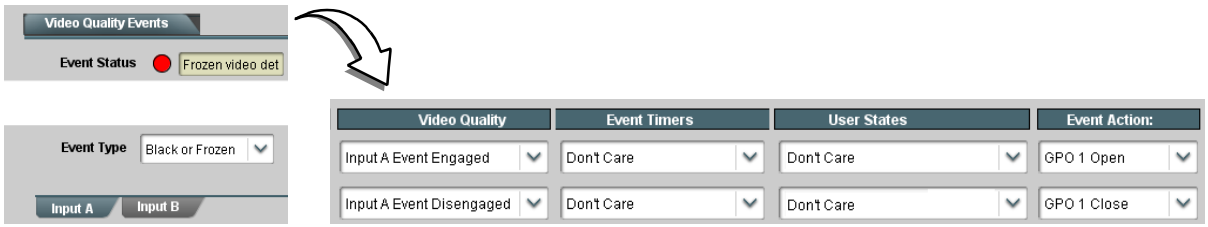
Pressing the **Force Event Refresh** button updates the list.

Table 3-1 BBG-1070-QS Function Menu List — continued

(continued)

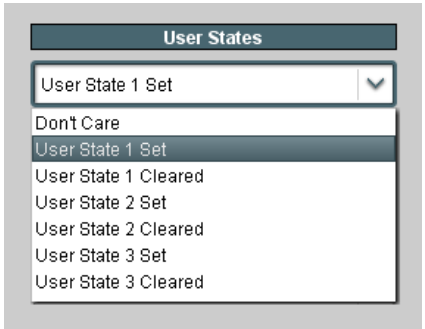
In the example here for Event 1, the **Video Quality Events** tab is set to screen for frozen video on Input A. When detected, this status can be used here (Video Quality set to “Input A Event Engaged” indicating black or frozen video detected). Using the Event Action selector, go-to action of **GPO 1 Open** can be invoked.

Conversely, to change the GPO state to the original state, an event could be set up with Video Quality here looking for “Input A Event Disengaged” and in turn invoke an event action of **GPO 1 Close**).



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.

- Loss of true conditions does not disengage an event-based triggering. A new set of true conditions must be defined and then occur to transition from one event-based trigger to another.
- Time required to engage an event-based trigger depends upon complexity of the called action. (For example, an action that invokes a video change will take longer to engage than an action involving only an audio routing change.)
- Make certain all definable event conditions that the device might be expected to “see” are defined in any of the Event 1 thru Event 32 rows. This makes certain that the device will always have a defined “go-to” action if a particular event occurs. For example, if the device is expected to “see” a 720p5994 stream or as an alternate, a 525i5994 stream, make certain both of these conditions are defined (with your desired go-to actions) in any two of the Event 1 thru Event 32 condition definition rows.
- Where multiple event screening is set up, the event you consider to be the highest priority should be set as higher priority than lesser events. Also, this prioritization helps ensure that all desired events are screened for before a significant change (such as input video source change) is effected.

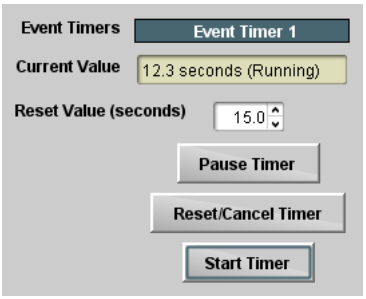


User States is a special column which allows a logic state to be set (similar to a register or latch) whenever a defined condition is first triggered. A user state (which is latched until cleared by some other definable action) can be sucessively used with other user states, thereby allowing a final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

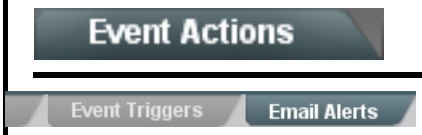
Three discrete user state latches are available in each row.

Table 3-1 BBG-1070-QS 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.



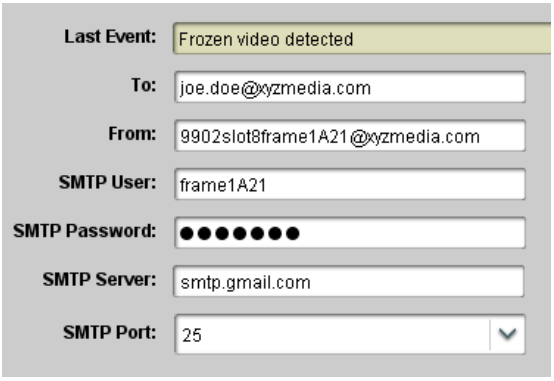
Event Timers 1 thru **3** (Timer 1 shown) can be set with count-down values. The Pause/Reset/Start control here are manual controls. The timers are available to be started, paused, or reset/cancelled using events in the **Event Triggers** sub-tab.



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

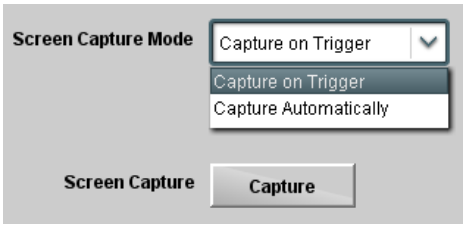
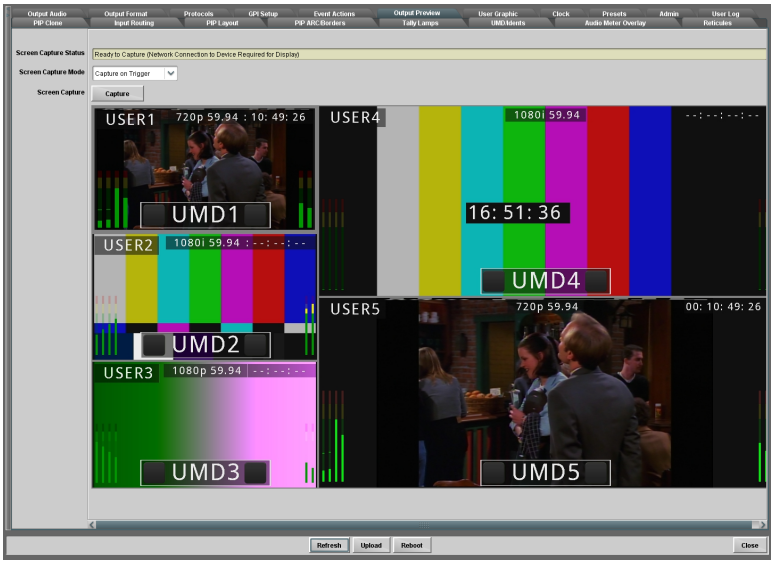
As an Event Action choice on the Events Triggers sub-tab, an Email alert can be sent as a response. Set up email fields as shown in the example below.

Note: Network connection 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-1070-QS Function Menu List — continued

<table>
<tr>
<td>
</td>
<td>Output Preview displays regularly-sampled screen captures in the device DashBoard page. The transfer of screen image frame captures (via the device through the DashBoard network connection) allows over-the-network confidence assessment of input video program content and presence over DashBoard remote control without physical collocation with BBG-1070-QS or its input or output steams.</td>
</tr>
<tr>
<td>• Screen Capture Mode Controls
 
</td>
<td>Screen Capture Mode sets the capture/display action as follows:
• Capture on Trigger allows manually initiated screen captures which are executed only when the Screen Capture button is pressed.
• Capture Automatically provides periodic samplings consisting of a new capture about every 5 seconds.
Note: This function operates only if the device is set to provide a progressive video output (e.g., 720p, 1080p, etc.).
It is recommended to set the Screen Capture Mode control to Capture On Trigger (or entirely disable Output Preview) when the preview function is no longer needed. DashBoard control motion may lack smoothness or act “jerky” if Capture Automatically is left enabled.</td>
</tr>
<tr>
<td colspan="2"> 

• When BBG-1070-QS is acquiring frame captures (either 5-second periodic-updated continuous images or single frame when Capture on Trigger > Capture is invoked), the area on the bottom of the DashBoard page displays the multiviewer image of the input video PiPs.
• The preview frame(s) will remain displayed in DashBoard.
• To exit from the capture display, click on any other DashBoard tab. DashBoard will then resume with the normal DashBoard control surface display.</td>
</tr>
</table>

Table 3-1 BBG-1070-QS Function Menu List — continued

Logo Insertion	Provides for insertion of loaded user graphic file which can be used as a branding “bug” or a personalized background “skin”.

Note: For a background skin, the file must have layer settings that allow transparency or PiP “windows” such that the graphic does not obscure the PiP image. Consult Product Support with any questions, or for questions regarding file formats and sizing.

Uploading Your Logo Graphic Image to BBG-1070-QS Device

A user memory area for images is reserved in the device. A standard .png file is converted to a .bin file which is uploaded to the device, where the .bin then provides the logo graphic used by the 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 device as described in the steps below.

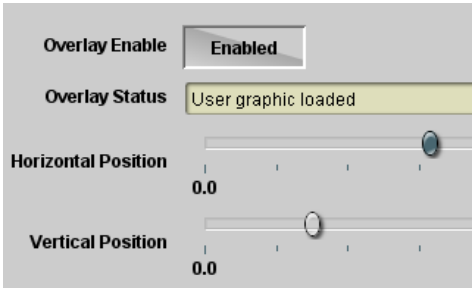
Note: • Your file **must** be a **.png** file with a .png extension. The filename should not contain spaces.

- No scaling is applied or available using the generator tool. (For example, if a 100 x 100 pixel image is uploaded to the tool, the image overlay will also be 100 x 100 pixel regardless of program video format or raster dimensions.)
- Transparency aspects in your native file are preserved in the generator conversion.

Use the conversion tool as described below.

1. With your .png sized as desired for insertion, go to **http://a.cdi-eng.com:55080/cgi-bin/image_upload.py**
2. Browse to your file. A prompt will appear to save the generated .bin file. Select Save (or Save As) to store the generated file in your desired folder. Close the tool when done.
3. In DashBoard on the 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.

• User Graphic Overlay Insert/Size Controls



Provides basic controls for enabling insertion and positioning the insertion within the overall merged PiP output video raster.

In the example here, the user graphic is inserted over the lower right PiP image area.

Note that the graphic insertion layer is behind burn-ins (such as UMD) but on top of the PiP video image. Sizing and transparency must be considered depending on the purpose of the graphic.

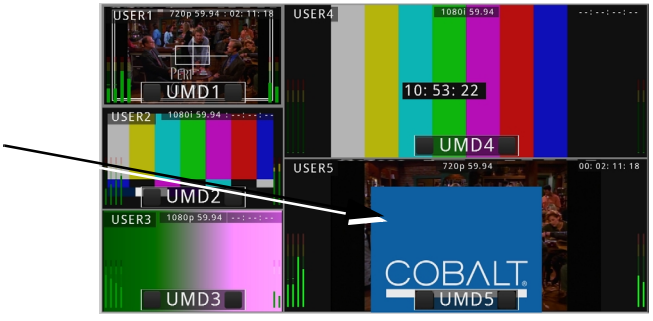


Table 3-1 BBG-1070-QS Function Menu List — continued

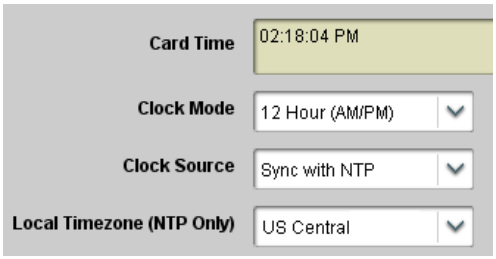
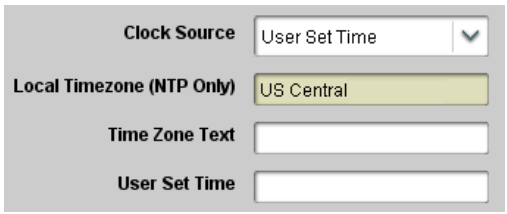
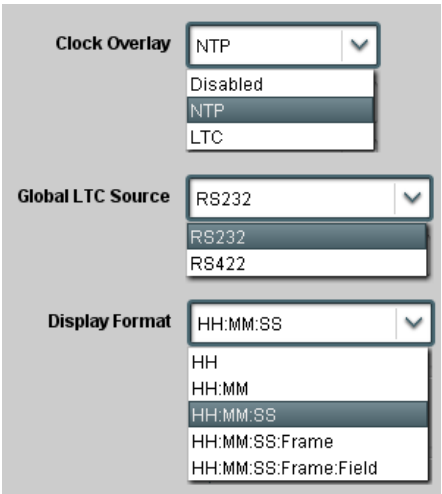
Clock	Provides controls for setting and inserting wall-clock time into merged output or as a per-PiP insertion selection.
• **Clock Mode / Set Controls** 	Allows clock time and display mode to be set as follows: • **Clock Mode** selects between 24-hour (“military”) time, or time using AM and PM designations. • **Clock Source** selects user-entered arbitrary time or NTP-synced time. • **Local Timezone** provides timezone offsets for localization when using NTP time. • **Card Time** display shows the currently configured running wall-clock time (whether set as user-entered arbitrary time or NTP-synced time). **Note:** NTP syncing is only done at various intervals. To invoke resyncing, power-cycle to device to immediately sync with NTP.
• **User Set Mode Controls** 	When **Clock Source** is set to **User Set Time**, allows entry of user time, and also allows entry of user text identifying the time zone or other text (this time zone text is displayed when entered for either user time or NTP time) Click **Set Time** to invoke user set time.
Note: Clock can be burned in as an overlay over the merged split output (using the controls below) and/or as a per-PiP insertion using the individual PiP 1 thru PiP 5 **UMD/Idents** insertion controls. Where insertion as a per-PiP Ident burn-in is desired, the enable control below does not have to be set to Enabled.	
• **Clock Overlay Select/Enable** 	• **Clock Overlay** allows wall-clock time to be burned into the **overall merged** video output. Also allows selecting source as NTP/User or external LTC. • **Global LTC Source** selects from RS232 or RS422 external timecode source when **LTC** is selected above. • Display Format (when LTC is selected above) selects the format of timecode string burn-in overlay insertion from choices shown. . **Clock Overlay** set to Enabled inserts a clock burn-in into the merged video output and not directly bound to any PiP area

Table 3-1 BBG-1070-QS Function Menu List — continued

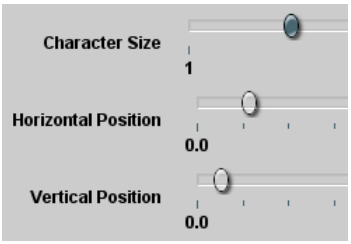
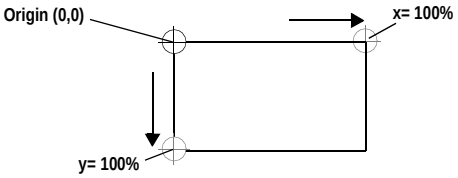
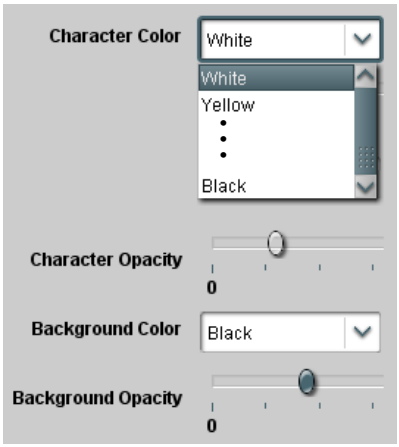
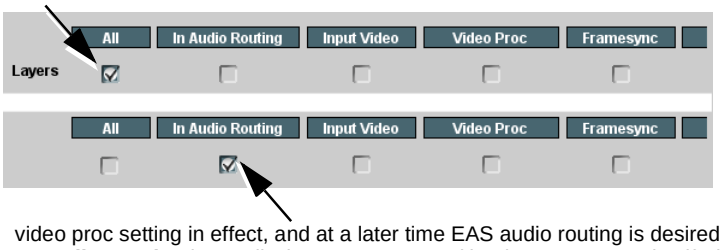
Clock	**(continued)**
• **Clock Character Size and Custom Position Controls** 	**Horizontal** and **Vertical Position** controls set the origin point for the clock overlay. 
• **Clock Text Character/Background Attributes Controls** 	Provides independent controls for setting the color and opacity of the clock text and its background. • **Color** drop-downs set text or background color from multiple choices. • **Opacity** controls set text or background opacity from 0% (least opacity) to 100% (full opacity).
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 card settings and save all settings to the defined preset with no masking.  Selecting a layer (in the example, “In Audio Routing”) will set the preset to **only** “look at” and “touch” audio routing settings and save these settings under the preset. When the preset is loaded (recalled), the card will only “touch” the audio routing layer. **Example:** Since EAS audio routing can be considered independent of video proc settings, if normal audio routing was set up with a particular video proc setting in effect, and at a later time EAS audio routing is desired to be saved and invoked as a preset, selecting **In Audio Routing** here tells the preset save and load to not concern itself with video proc settings. In this manner, any video proc settings in effect when the EAS preset is invoked will not affect any video proc settings that might be currently in effect.	

Table 3-1 BBG-1070-QS Function Menu List — continued

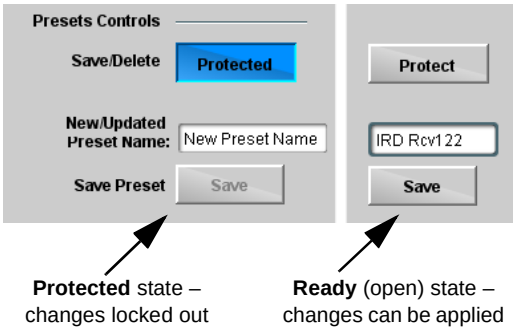
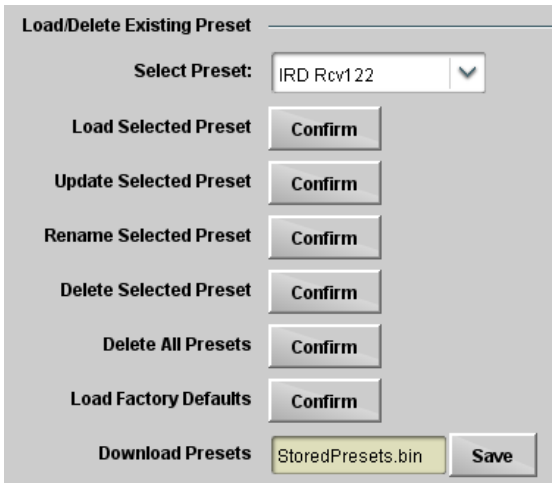
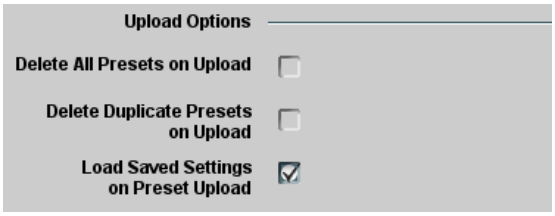
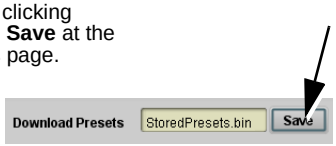
Presets	**(continued)**
• **Preset Enter/Save/Delete** 	Locks and unlocks editing of presets to prevent accidental overwrite as follows: • **Protect (ready):** This state awaits Protected and allows preset Save/ Delete button to save or delete current card settings to the selected preset. **Use this setting when writing or editing a preset.** • **Protected:** Toggle to this setting to lock down all presets from being inadvertently modified or deleted. **Use this setting when all presets are as intended.** • **New/Updated Preset Name:** Field for entering user-defined name for the preset being saved (in this example, “IRD Rcv122”). • **Save:** Saves the current card 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 (engaging) the selected preset. When this button is pressed, the changes called out in the preset are immediately applied. **Note:** Controls below that modify or delete presets are grayed-out (inactive) when Save/Delete button is in **Protected** mode. To use these controls, make certain Protected is not enabled. • **Update - Rename - Delete Selected Preset** buttons allow selected preset to be updated (take in current custom settings), be renamed, or be deleted. A Confirm prompt appears in all cases. • **Delete All Presets** button allows a delete of **all** stored presets. (This is useful if all presets are to be replaced by a new Presets .bin file.) • **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.
	• **Upload Options** checkboxes function as follows: • **Delete All Presets on Upload** clears all stored presets, and then replaces or adds any presets as defined in the uploaded Presets .bin file. (This is useful to establish a “clean slate” and remove any presets that may no longer be desired.) • **Delete Duplicate Presets on Upload** clears stored presets bearing the same name as currently stored presets. (This avoids dual iterations of same preset name (plain and duplicate using “*” marking), and avoids possibility of “stale” presets no longer desired from appearing as a choice.) • **Load Saved Settings on Preset Upload** makes certain any local card settings card state is retained following a preset upload. When checked, a preset within the upload is invoked only when specifically selected and invoked. **Note:** Any combination of checkboxes can be checked or unchecked (enabled or disabled) as desired.
Note: If using **Cascade Config** mode where a global preset is to apply in some manner to all units in the chain, it is recommended to have all units in the chain set up as desired, and then save the preset on the **last** unit in the chain. This helps ensure that **all** saved states in each unit will be saved in an “umbrella” preset encompassing **all** units in the chain.	

Table 3-1 BBG-1070-QS Function Menu List — continued

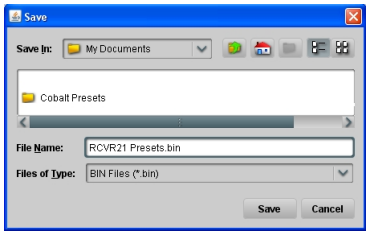
Presets	(continued)

Download (save) 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*).

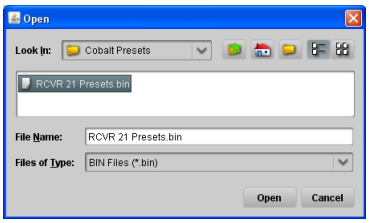
The file can then be renamed if desired (*RCVR21 Presets* in this example) before committing the save.



Upload (open) 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 unit.



Note: • Preset transfer between unit 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.

Uploading Saved Presets to New or Different BBG-1070-QS Units (Cascade Config Usage)

When uploading presets .bin files to BBG-1070-QS units in a Cascade Config chain, the steps below must be used to make certain each unit receives cascade setup info which is stored individually on each unit.

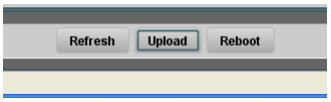
1. Upload the desired presets .bin file to all units in the chain.
2. On the **Cascade Config** tab in any unit in the chain, re-link the IP settings for the units within the cascade chain.
3. Select one of the presets you want to configure; all the connected units will then have the matching preset automatically selected. On **Presets** page of any unit in the chain, click **Load Selected Preset**. All units will now be loaded with that preset.
4. On **Preset** page of any unit in the chain, now click **Upload Selected Preset**. This step now re-saves the cascade IP settings to each unit's memory.
5. Repeat steps 3 and 4 for **each** preset in the **Select Preset** drop-down list. (Note that even presets that may not apply to other units in the chain need to updated as described here. For subsequent presets, remove all IPs from the Cascade Config tab and click **Disconnect**. Then load the presets and then update the preset.) **Contact Support for assistance if necessary.**

Table 3-1 BBG-1070-QS 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 firmware upgrade files.
• **Firmware Upgrade Controls**	Firmware upgrade controls allow a selected firmware version (where multiple versions can be uploaded to the unit's internal memory) to invoke an upgrade to a selected version either instantly, or set to install on the next unit reboot (thereby allowing unit upgrade downtime to be controlled at a scheduled point in time).

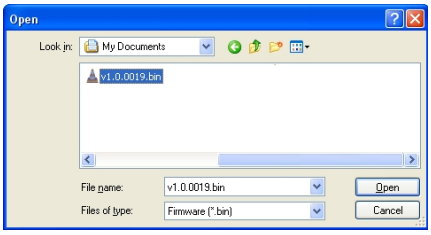
Note: The page/tab here allows managing multiple firmware versions saved on the unit. New upgrade firmware from our web site can always be directly uploaded to the unit without using this page. Instructions for firmware downloading to your computer and uploading to the unit can be found at the **Support>Firmware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

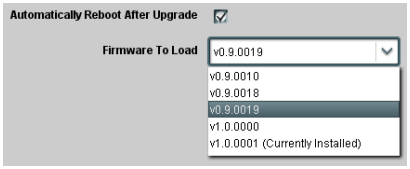
3. Select the desired file and click **Open** to upload the file to the unit.



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

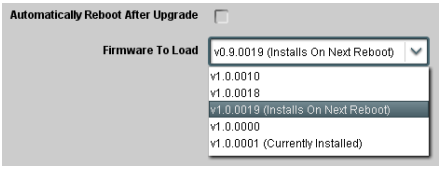
1. Click **Firmware To Load** and select the desired upgrade file to be loaded (in this example, "v1.0.0019").

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

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

Table 3-1 BBG-1070-QS Function Menu List — continued

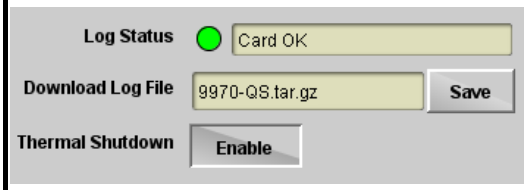
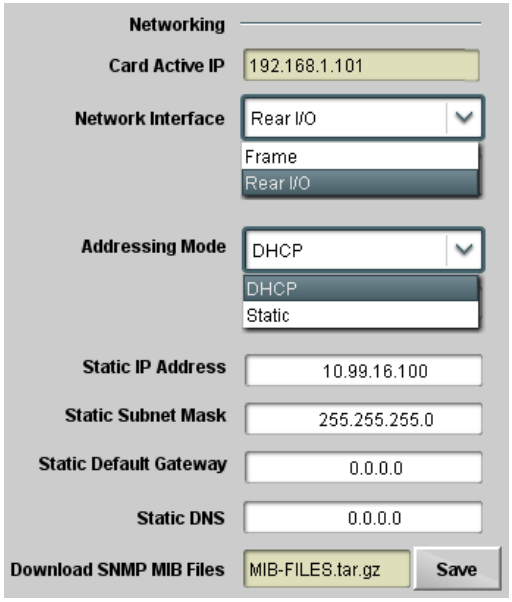
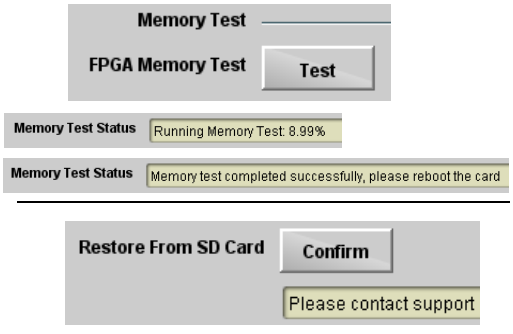
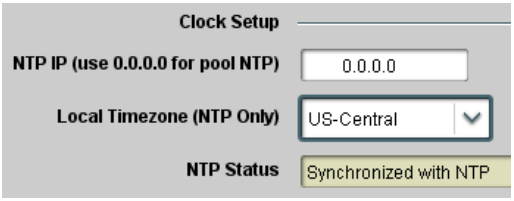
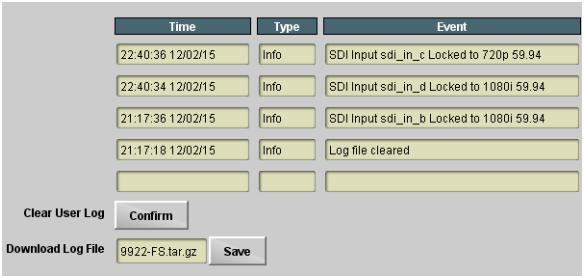
Admin	**(continued)**
• Log Status and Download Controls 	• **Log Status** indicates overall internal operating status. • **Download Log File** allows a operational log file to be saved to a host computer. This log file can be useful in case of a error or in the case of an operational error or condition. The file can be submitted to Cobalt engineering for further analysis. • **Thermal Shutdown** enable/disable allows the built-in thermal failover to be defeated. (Thermal shutdown is enabled by default). **CAUTION** **The BBG-1070-QS 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 protection.**
• Network Setup Controls 	**Note:** The IP address setting here is independent of a frame IP typically used for DashBoard or other frame/device remote control. • **Addressing Mode** allows setting address to static (user) address or via DHCP (where a DHCP server is available for the connection). • **Static IP Address**, **Static Subnet Mask**, and **Static Default Gateway** fields allow setting IP parameters when Static mode is selected. • **Card Active IP** shows the currently configured IP address (whether static or DHCP).
• 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.

Table 3-1 BBG-1070-QS Function Menu List — continued

Admin	**(continued)**
• **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.
User Log	Automatically maintains a log of user actions and input lock status.
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-1070-QS 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.

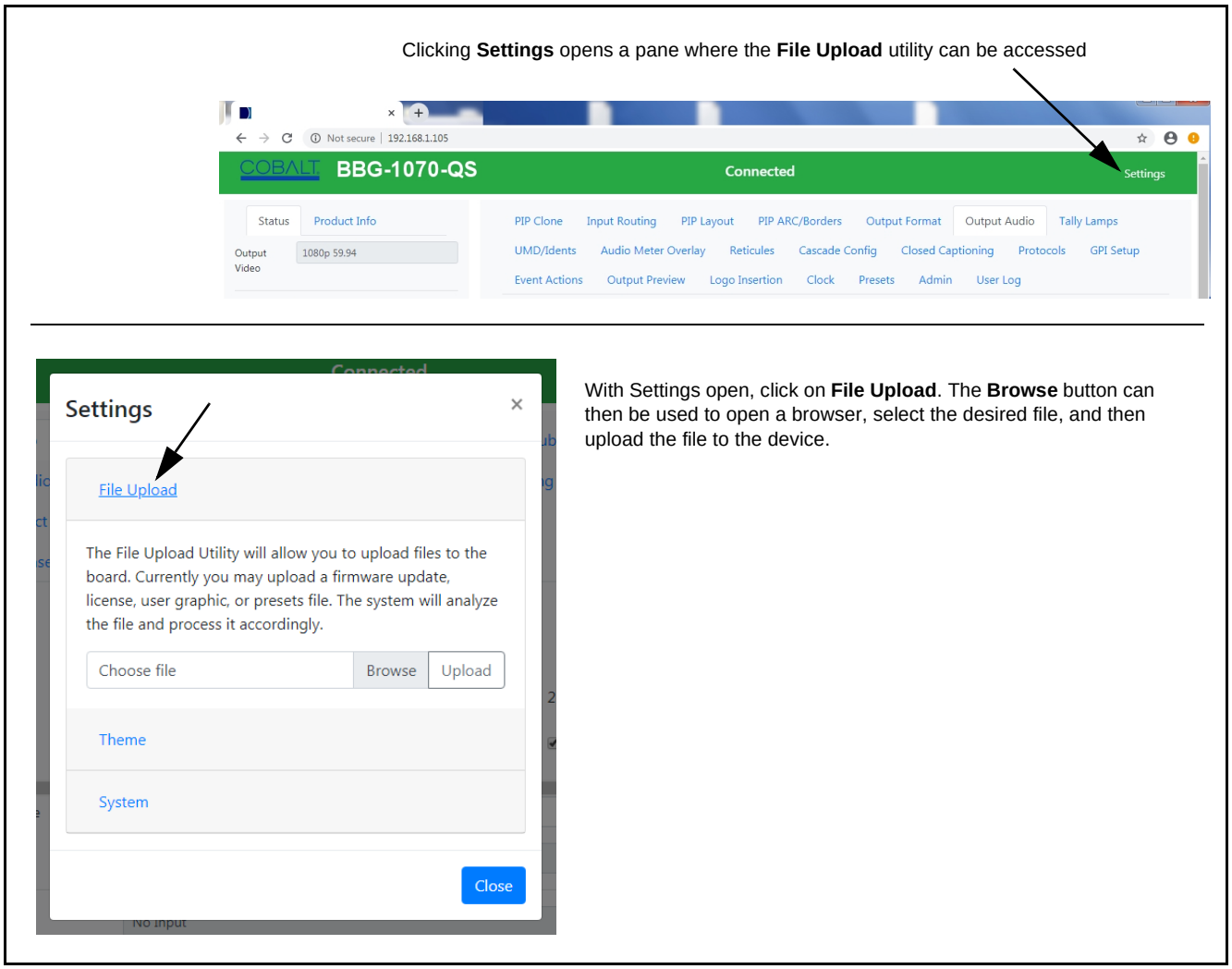


Figure 3-7 Uploads Using Web Interface/GUI

Front Panel User Menus

Some of the mode and parametric controls available using the web UI (as described in Front Panel User Menus) are available using the front panel display and arrow navigating buttons.

The front panel menus offers a true standalone means to configure the BBG-1070-QS 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 or DashBoard remote control be used for all applications other than the most basic cases.

Troubleshooting

This section provides general troubleshooting information and specific symptom/corrective action for the BBG-1070-QS and its remote control interface. The BBG-1070-QS 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-1070-QS itself and its remote control provide error and failure indications. Depending on how the BBG-1070-QS is being used (i.e, standalone or network controlled), check all available indications in the event of an error or failure condition.

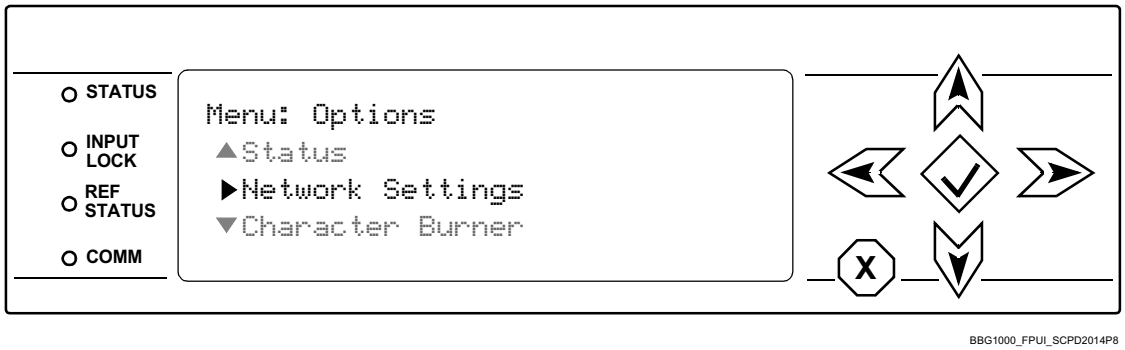
The various BBG-1070-QS device and remote control error and failure indicators are individually described below.

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. 3-66)
- BBG-1070-QS Processing Error Troubleshooting (p. 3-66)

BBG-1070-QS Front Panel Status/Error Indicators and Display

Figure 3-8 shows and describes the BBG-1070-QS 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-1070-QS 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-1070-QS 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 may indicate an error with the device.	

Figure 3-8 BBG-1070-QS 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-1070-QS, 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-1070-QS. This can be observed using the Status front-panel or web UI pane.
	  • If display shows **no** power being consumed, either the frame power supply, connections, or the BBG-1070-QS itself is defective.
	  • If display shows **excessive** power being consumed (see Technical Specifications (p. 1-11) in Chapter 1, “Introduction”), the BBG-1070-QS 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-1070-QS 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-1070-QS Processing Error Troubleshooting

Table 3-3 provides BBG-1070-QS processing troubleshooting information. If the BBG-1070-QS 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-1070-QS is not appropriately set for the type of signal being received by the device.

Note: Where errors are displayed on both the BBG-1070-QS and network remote controls, the respective indicators and displays are individually described in this section.

Table 3-3 Troubleshooting Processing Errors by Symptom

Symptom	Error/Condition	Corrective Action
BBG-1070-QS shows **Unlocked** message in BBG-1070-QS Info pane.	No video input present	Make certain intended video source is connected to appropriate BBG-1070-QS video input. Make certain BNC cable connections are OK.
Cannot see one of five PiPs on output	PiP obscured by another PiP	When custom layouts are being used, it is easy for a PiP to “hide” underneath another PiP. When using this mode, size all PiPs small enough such that a PiP cannot be obscured. See Input Routing (p. 3-10) for more information.
Cascade mode upstream image not as expected	• -QS devices in cascade chain not set for same grid layout	• All BBG-1070-QS devices used in a cascading chain must be set for the same number of columns and rows. See Cascade Mode Using PiP Layout QuickSet Template Presets (p. 3-16) for more information.
	• Downstream -QS device importing a cascade input not set for cascading mode	• Downstream QS devices which are receiving a cascade output from an upstream QS device must use the PiP 5 input and be set with **Cascade Mode > Enabled**. This ensures the imported upstream image is inserted as full-screen and with no burn-ins caused by the receiving -QS device. See Input Routing (p. 3-10) controls for more information.
Cannot set UMD text Display Format to choice other than External Input	Protocols tab inadvertently set to use router for UMD assert/ burn-in	If the **Protocols** tab > **Enable Utah Router Fetch** control is set to Enabled, UMD text is asserted by Utah router commands. The UMD > Display Format control is locked to External Input, with user text entry or other UMD type selections locked out.
Cascade grid layout has been inadvertently lost	Non-cascade mode using the Layout Presets (Quint, Quad, Three Bottom, etc.) was possibly applied	The non-cascade Layout Presets will clear or change row/column settings previously set for a custom cascading grid that was set up using the cascading QuickSet setup controls. The basic non-cascade Layout Presets should not be re-applied once a cascade layout is set up.
Cannot set UMD text Display Format to choice other than External Input	External Inputs tab inadvertently set to use router for UMD assert/burn-in	If the **External Inputs** tab > **Enable Utah Router Fetch** control is set to Enabled, UMD text is asserted by Utah router commands. The UMD > Display Format control is locked to External Input, with user text entry or other UMD type selections locked out.
Audio not processed or passed through device	Enable control not turned on	On **Output Audio Routing/Controls** tab, **Audio Group Enable** control for group 1 thru 4 must be turned on for sources to be embedded into respective embedded channel groups.
Output Preview function does not provide preview pane display.	Device is not set to provide a progressive raster video output	This function operates only if the device is set to provide a progressive video output (e.g., 720p, 1080p, etc.)

Table 3-3 Troubleshooting Processing Errors by Symptom — continued

Symptom	Error/Condition	Corrective Action
DashBoard slider controls lack fluidity, have “jerky” motion.	DashBoard experiencing high traffic volume due to **Output Preview** mode set to Capture Automatically	Automatically updated captures are useful for assessing incoming content on a dynamic basis. However, due to the traffic demands imposed by this mode, it is recommended to set the **Screen Capture Mode** control to Capture On Trigger (or entirely disable Output Preview) when the preview function is no longer needed. When the mode is set to capture on trigger or this function is disabled, normal fluid control motion will be restored. See Output Preview (p. 3-54) for more information.
(Cascade Config mode) User text (UMD, Idents) does not appear in cloned PiPs	Manually entered user text cannot be cloned	Only pre-defined DashBoard selections (from drop-downs or other selections) can be cloned from one PiP to another. User custom text cannot be cloned and **must** be entered manually for each PiP UMD and/or Ident field.
(Cascade Config mode) Presets cannot be uploaded from computer to units	Special upload steps required	Saved preset .bin files from a computer to target units must be uploaded as described in Loading Saved Presets to New or Different BBG-1070-QS Units (Cascade Config Usage) (p. 3-59).
Text entered using triggered Event Action persists (even if event cleared/false)	—	Optional triggered ident text may persist even if condition is cleared. **Ident Update** button on respective **UMD/Idents** sub-tab may need to be pressed to restore text as entered in Ident sub-tab.
Event setup/action, following pressing **Force Event** engagement button, persists	—	If **Engage Mode** > **Force Event** is invoked for an event, event action will stay persistent unless forced by a new event action. With Engage Mode set to Use Event Rules, set up conditions for a clearing event. This will disengage forced event.
Selected upgrade firmware will not upload	Automatic reboot after upgrade turned off	Device **Presets** > **Automatically Reboot After Upgrade** box unchecked. Either reboot the device manually, or leave this box checked to allow automatic reboot to engage an upgrade upon selecting the upgrade.

In Case of Problems

Recovering Card From SD Memory Card

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

1. (See Figure 3-9.) 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.

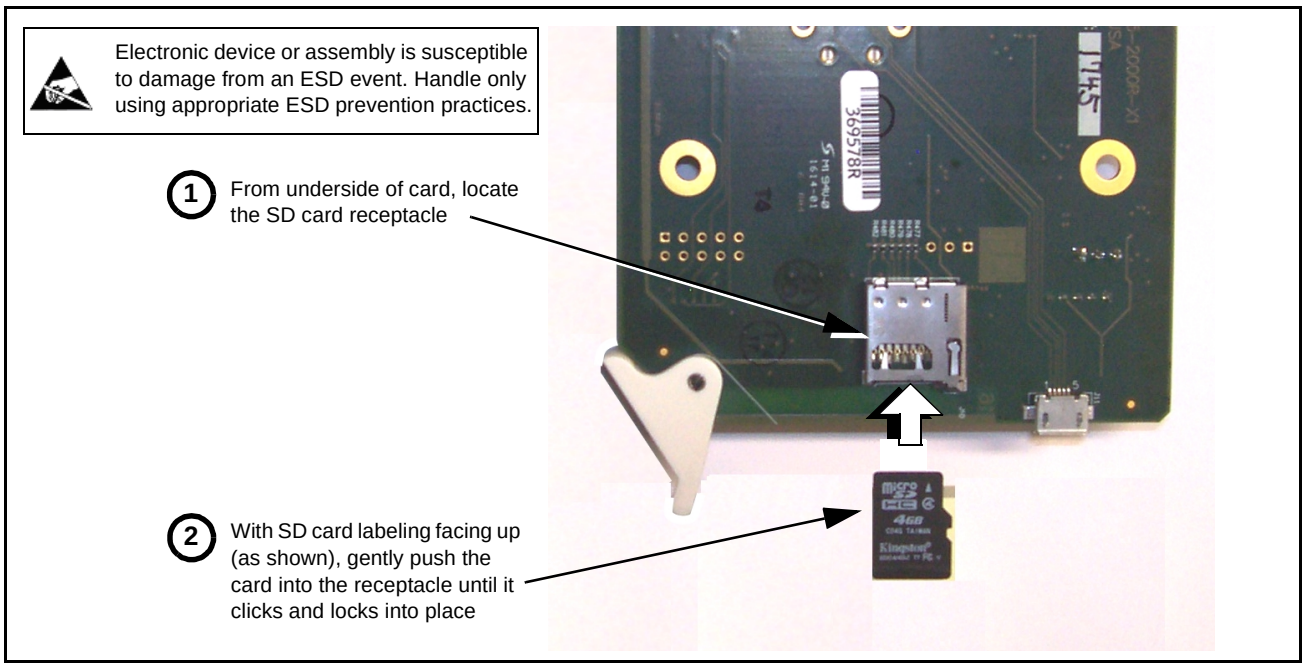


Figure 3-9 SD Card Installation

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

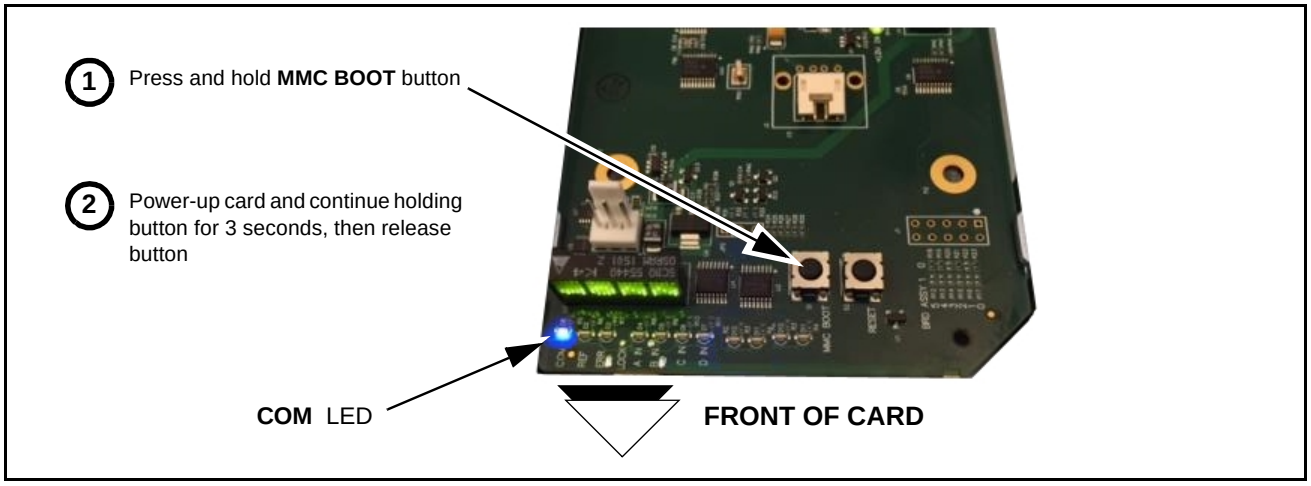


Figure 3-10 MMC Boot Button

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. 1-14) in Chapter 1, "Introduction" for contact information.

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