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Our mission is to:
1. Provide a Superior Customer Experience
   • offer the best product quality and support
2. Make Cool Practical Technology
   • develop great products that customers love

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If anything at all with your Ross experience does not live up to your expectations be sure to reach out to us at solutions@rossvideo.com.

David Ross
CEO, Ross Video
dross@rossvideo.com

Ross Video Code of Ethics

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1. We will always act in our customers' best interest.
2. We will do our best to understand our customers' requirements.
3. We will not ship crap.
4. We will be great to work with.
5. We will do something extra for our customers, as an apology, when something big goes wrong and it's our fault.
6. We will keep our promises.
7. We will treat the competition with respect.
8. We will cooperate with and help other friendly companies.
9. We will go above and beyond in times of crisis. *If there's no one to authorize the required action in times of company or customer crisis - do what you know in your heart is right. (You may rent helicopters if necessary.)*
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Patents


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Safety Notices

Refer to the "Important Regulatory and Safety Notices" document that accompanied your product.

Statement of Compliance

This product has been determined to be compliant with the applicable standards, regulations, and directives for the countries where the product is marketed.

Compliance documentation, such as certification or Declaration of Compliance for the product is available upon request by contacting techsupport@rossvideo.com. Please include the product; model number identifiers and serial number and country that compliance information is needed in request.
EMC Notices

US FCC Part 15
This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a Commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Notice — Changes or modifications to this equipment not expressly approved by Ross Video Ltd. could void the user’s authority to operate this equipment.

Canada
This Class “A” digital apparatus complies with Canadian ICES-003 and part 15 of the FCC Rules.
Cet appareil numerique de la classe “A” est conforme a la norme NMB-003 du Canada.

European Union
This equipment is in compliance with the essential requirements and other relevant provisions established under regulation (EC) No 765/2008 and Decision No 768/2008/EC referred to as the “New Legislative Framework”.

Warning — This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

Australia/New Zealand
This equipment is in compliance with the provisions established under the Radiocommunications Act 1992 and Radiocommunications Labeling (Electromagnetic Compatibility) Notice 2008.

Korea
This equipment is in compliance with the provisions established under the Radio Waves Act.
Class A equipment (Broadcasting and communications service for business use)
This device is a business-use (Class A) EMC-compliant device. The seller and user are advised to be aware of this fact. This device is intended for use in areas outside home.

<table>
<thead>
<tr>
<th>Type of Equipment</th>
<th>User’s Guide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A Equipment (Industrial Broadcasting &amp; Communication Equipment)</td>
<td>This equipment is Industrial (Class A) electromagnetic wave suitability equipment and seller or user should take notice of it, and this equipment is to be used in the places except for home.</td>
</tr>
</tbody>
</table>
International

This equipment has been tested under the requirements of CISPR 22:2008 or CISPR 32:2015 and found to comply with the limits for a Class A Digital device.

Notice — This is a Class A product. In domestic environments, this product may cause radio interference, in which case the user may have to take adequate measures.

Maintenance/User Serviceable Parts

Routine maintenance to this openGear product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the “Contact Us” section of this manual. All openGear products are covered by a generous 5-year warranty and will be repaired without charge for materials or labor within this period. See the “Warranty and Repair Policy” section in this manual for details.

Environmental Information

The equipment may contain hazardous substances that could impact health and the environment. To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.

If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration. You can also contact Ross Video for more information on the environmental performances of our products.

Security and Privacy

If you would like more information on how Ross Video security and privacy practices have been applied to the GATOR-TOOLBOX, what you should know about maintaining security of this product, and how we can partner with you to ensure security throughout this product's life-cycle, contact techsupport@rossvideo.com.

Ross Video has implemented reasonable administrative, technical, and physical safeguards to help protect against security incidents and privacy breaches involving a Ross Video product provided those products are used in accordance with Ross Video instructions for use. However, as systems and threats evolve, no system can be protected against all vulnerabilities and we consider our customers the most important partner in maintaining security and privacy safeguards. If you have any concerns, we ask that you bring them to our attention, and we will investigate. Where appropriate, we will address the issue with product changes, technical bulletins and/or responsible
disclosures to customers and regulators. Ross Video continuously strives to improve security and privacy throughout the product life-cycle using practices such as:

- Privacy and Security by Design
- Product and Supplier Risk Assessment
- Vulnerability and Patch Management
- Secure Coding Practices and Analysis
- Vulnerability Scanning
- Access Controls appropriate to Customer Data
- Incident Response
- Clear paths for two-way communication between customers and Ross Video

If you would like to report a potential product related privacy or security issue (incident, breach, or vulnerability), contact techsupport@rossvideo.com.

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Introduction

This guide covers the installation, configuration, and use of the GATOR-TOOLBOX Multi-format Frame Synchronizer. The following chapters are included:

- “Introduction” summarizes the guide and provides important terms, and conventions.
- “Before You Begin” provides general information to keep in mind before installing and configuring your card.
- “Hardware Overview” provides a basic introduction to the GATOR-TOOLBOX hardware features including the supported rear modules.
- “Physical Installation” provides instructions for the physical installation of the card and its rear module into an openGear frame.
- “Cabling” provides an overview of connecting input and output devices to the rear module of the GATOR-TOOLBOX.
- “Getting Started” outlines how to display the card interfaces in DashBoard.
- “Configuring the Network Settings” outlines how to update the network settings assigned to the GATOR-TOOLBOX.
- “Licensed Features” outlines the available software licensed features, and how to install a software key for a licensed feature.
- “Reference Setup” outlines the frame rate compatibility, and how to configure and monitor the reference signal the GATOR-TOOLBOX will use for timing purposes.
- “Basic Video Configuration” outlines how to specify the output format and video source, adjust the timing, and summarizes what the card will do during a loss of signal.
- “Configuring 2SI Quad Link” provides information for configuring the card to carry UHD video content.
- “Configuring SQD Quad Link” provides information on the Square Division Quad feature of the GATOR-TOOLBOX.
- “Configuring the GPI/Tallies” outlines how to configure each GPI/Tally independently on the GATOR-TOOLBOX.
- “Format Converter Setup” provides instructions for configuring the Format Converter (FRC) licensed feature using the menus in DashBoard.
- “SDR/HDR Conversion” summarizes how to use the Proc Amps and RGB Color Correctors of the card.
- “Ancillary Data” provides an overview of ANC processing for the GATOR-TOOLBOX.
- “Audio Configuration” provides instructions for configuring the audio features using the menus in DashBoard.
- “Using Presets” outlines how to save and recall preset configurations to your GATOR-TOOLBOX.
- “Upgrading the Software” outlines how to upgrade the GATOR-TOOLBOX via DashBoard.
- “DashBoard Interface Overview” summarizes the menus and parameters of the GATOR-TOOLBOX tabs in DashBoard.
- “Technical Specifications” provides the specifications for the GATOR-TOOLBOX.
- “Supported SFP Modules” provides the specifications for each supported SFP module.
- “Service Information” provides information on the warranty and repair policy for your GATOR-TOOLBOX.
- “Software Licenses” provides third-party software license information for your GATOR-TOOLBOX.
- “Glossary” provides a list of terms used throughout this guide.
Related Publications

It is recommended to consult the following Ross documentation before installing and configuring your GATOR-TOOLBOX:

- **DashBoard User Guide**, Ross Part Number: 8351DR-004
- **MFC-OG3-N User Guide**, Ross Part Number: 8322DR-004
- **OGX-FR Series User Guide**, Ross Part Number: 8322DR-204

Documentation Conventions

Special text formats are used in this guide to identify parts of the user interface, text that a user must enter, or a sequence of menus and sub-menus that must be followed to reach a particular command.

Interface Elements

Bold text is used to identify a user interface element such as a dialog box, menu item, or button. For example:

In the **Network** tab, click **Apply**.

User Entered Text

Courier text is used to identify text that a user must enter. For example:

In the **Language** box, enter **English**.

Referenced Guides

Text set in bold and italic represent the titles of referenced guides, manuals, or documents. For example:

For more information, refer to the **DashBoard User Manual**.

Menu Sequences

Menu arrows are used in procedures to identify a sequence of menu items that you must follow. For example, if a step reads “**File** > **Save As**,” you would click the **File** menu and then click **Save As**.

Important Instructions

Star icons are used to identify important instructions or features. For example:

🌟 Contact your IT department before connecting to your facility network to ensure that there are no conflicts. They will provide you with an appropriate value for the IP Address, Subnet Mask, and Gateway for your device.

Contacting Technical Support

At Ross Video, we take pride in the quality of our products, but if problems occur, help is as close as the nearest telephone.

Our 24-hour Hot Line service ensures you have access to technical expertise around the clock. After-sales service and technical support is provided directly by Ross Video personnel. During business hours (Eastern Time), technical support personnel are available by telephone. After hours and on weekends, a direct emergency technical support phone line is available. If the technical support person who is on call does not answer this line immediately, a voice message can be left...
and the call will be returned shortly. This team of highly trained staff is available to react to any problem and to do whatever is necessary to ensure customer satisfaction.

- **Technical Support**: (+1) 613-652-4886
- **After Hours Emergency**: (+1) 613-349-0006
- **E-mail**: techsupport@rossvideo.com
- **Website**: http://www.rossvideo.com
Before You Begin

If you have questions about the operation of GATOR-TOOLBOX, contact us at the numbers listed in "Contacting Technical Support". Our technical staff is always available for consultation, training, or service.

Features

The GATOR-TOOLBOX includes the following features:

- High quality conversion engine delivering best quality Up/Down/Cross conversion over a wide variety of formats including:
  - 2160p 23.98/24/25/29.97/30/50/59.94/60
  - 1080p 23.98/24/25/29.97/30/50/59.94/60
  - 1080i 50/59.94/60
  - 720p 50/59.94/60
- Advance Motion adaptive de-interlacing with cadence detection
- Optional high quality motion adaptive linear frame rate conversion
- Optional 3D-LUT for advanced HDR/WCG conversion
- Support for importing industry-standard 3D-LUT 33x33x33 RGB cube files
- HDR support with conversion from and to SDR, PQ, S-LOG3, and HLG
- Support for BT.709 and Wide Color Gamut BT.2020
- Input RGB Color correction and Proc amps
- Support for Single link HD/3G/UHD SDI, Quad 3G 2SI through flexible gearboxes
- Support for 12G SDI fiber (GATOR-2F only)
- Detects the incoming video formats and converts to the assigned output format
- Built in frame synchronizer times the outputs to a selectable local or frame wide reference
- Supports bi-level, and tri-level sync
- Passes SMPTE 291M formatted vertical ancillary data from input to output
- 16 channels of discrete AES embed / de-embed (GATOR-4A / GATOR-4B only)
- 16 channels embedded audio pass through with SRC with full embedded audio processing and ability to delay relative to video
- Reports status and configuration remotely via the DashBoard control system
- Compatible with DataSafe
- Fully compliant with openGear specifications
- 5-year transferable warranty

Supported Formats for Conversion

The following table outlines the supported formats for conversion by the GATOR-TOOLBOX, and the required license(s).
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</table>

- **Supported**
- **UHD License Required**
- **FRC License Required**
- **UH and FRC Licenses Required**

X: Supported
U: UHD License Required
F: FRC License Required
UF: UH and FRC Licenses Required
GATOR-2, GATOR-4A, and GATOR-4B Block Diagram

Figure 1 provides a general overview when using the GATOR-2, GATOR-4A, or GATOR-4B systems.

* The type of AES connections (balanced or unbalanced) depends on the rear module installed with the card.

Figure 1 Functional Block Diagram — GATOR-2, GATOR-4A, or GATOR-4B

For More Information on...
- the hardware versions of GATOR-TOOLBOX, refer to “Hardware Overview”.
SNMP Monitoring and Control

The Network Controller card in the openGear frame provides optional support for remote monitoring of your frame and the GATOR-TOOLBOX card using Simple Network Management Protocol (SNMP), which is compatible with many third-party monitoring and control tools.

For More Information on...

• enabling SNMP Monitoring and Control for your frame, refer to the **MFC-OGX User Guide**.
• SNMP controls for your card, refer to its Management Information Base (MIB) file. Contact Ross Technical Support for this file.

Using DataSafe

DataSafe enables you to load and store card parameters automatically, or you can load from and store to a single file in DashBoard. Ensure that you are loading parameters to the same model of card. The DataSafe feature is available for openGear frames using the MFC-OG3-N or MFC-OGX-N card only. For details on using the DataSafe feature, refer to the **MFC-OGX User Guide** and the **DashBoard User Guide**.

* The Ethernet setup settings are not restored/saved using DataSafe.
Integration Example

GATOR-TOOLBOX is an easy to use signal chain problem solver that can be quickly integrated within an existing work flow to perform format, transport, rate and dynamic range conversion. The following example will walk you through the most common settings required to add your card to an existing setup.

System Integration Example

A user is building a flight pack that will drive large UHD monitors with live SDR or HDR content. The setup includes the following:

- The cameras are multi-link UHD or 3G
- Converting multi-link UHD to single-link UHD necessary to fit within the router I/O
- Some sources are asynchronous both UHD and below
- The graphic source output at 60Hz and needs to be converted to HDR

![Figure 3 Example of a Work Flow with GATOR-TOOLBOX](image)

Basic Setup

The user needs to physically install the GATOR-TOOLBOX and ensure the following tasks are performed:

1. Install and configure the openGear frame that houses the GATOR-TOOLBOX. Refer to the OGX-FR Series User Guide for details.
2. Install the rear module for the GATOR-TOOLBOX. Refer to “Installing the Rear Module into the openGear Frame”.
3. Install the GATOR-TOOLBOX into the openGear frame. Refer to “Installing the GATOR-TOOLBOX Card into an openGear Frame”.
4. Connect the SDI signals to the GATOR-TOOLBOX rear module. Refer to “Cabling”.

Network Settings

Now the user needs to connect the GATOR-TOOLBOX to the network and ensure it can communicate with a computer running the latest DashBoard client software. The DashBoard client software enables you to monitor, configure, and operate your GATOR-TOOLBOX.

The user must perform the following tasks to access and configure the GATOR-TOOLBOX:
1. Verify that a computer running the latest DashBoard client software is installed and available on the same subnet as the GATOR-TOOLBOX. The DashBoard client software and user guide are available from our website.

2. Verify that the openGear frame displays in the Tree View of DashBoard. Refer to the *OGX-FR Series User Guide* for details.

3. Display the GATOR-TOOLBOX in DashBoard as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.

**Configure the GATOR-TOOLBOX**

The GATOR-TOOLBOX is now ready for configuration. To complete the setup, the user must:

1. Select a valid reference source. Refer to “Specifying a Global Reference Source”.
2. Specify the transport type that the stream the GATOR-TOOLBOX will ingest. Refer to “Basic Video Configuration”.
3. Specify the transport type that the GATOR-TOOLBOX will output. Refer to “Basic Video Configuration”.
4. Specify the output format. Refer to “Basic Video Configuration”.
5. Specify the output timing requirements. Refer to “Basic Video Configuration”.

**Solution for Audio Processing**

A production setup has a stereo embedded audio source but:

- the video is asynchronous and is delayed by 8 frames due to passing through a virtual set
- the gain on the microphone is set too low and needs to be corrected

**Overview**

The solution for this user is to:

1. Enable Sample Rate Conversion (SRC) on the GATOR-TOOLBOX. Refer to “To set up processing of the embedded audio input”.
2. Increase the audio gain to the required level. Refer to “To set up processing of the embedded audio input”.
3. Delay the audio by the required amount. Refer to “To set up processing of the embedded audio input”.
4. Map the stereo channel to channels 1,2 and 7,8 respectively. Refer to “To map a channel”.


Hardware Overview

This chapter presents information on the GATOR-TOOLBOX hardware components and features.

Overview

The GATOR-TOOLBOX is an openGear modular system composed of two sub-systems:

- a main PCB which connects to a rear module and the openGear frame midplane
- a rear module that provides physical connectors

Table 1 outlines which rear module mates with specific main PCB version and openGear frames.

Table 1 Rear Modules — Supported openGear Frames

<table>
<thead>
<tr>
<th>Code Displayed in DashBoard</th>
<th>Main PCB Marketing Code</th>
<th>PCB Part Number</th>
<th>Rear Module Marketing Code</th>
<th>Rear Module Part Number</th>
<th>Supported openGear Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>GATOR-TOOLBOX</td>
<td>GATOR-2</td>
<td>8929AR-251</td>
<td>R4-GATOR</td>
<td>8323AR-325</td>
<td>OGX-FR</td>
</tr>
<tr>
<td>GATOR-TOOLBOX</td>
<td>GATOR-2F</td>
<td>8929AR-252</td>
<td>R4F-GATOR</td>
<td>8323AR-327</td>
<td>OGX-FR</td>
</tr>
<tr>
<td>GATOR-TOOLBOX-A</td>
<td>GATOR-4A</td>
<td>8929AR-253</td>
<td>R3A-GATOR</td>
<td>8322AR-319C</td>
<td>OG3-FR OGX-FR</td>
</tr>
<tr>
<td>GATOR-TOOLBOX-B</td>
<td>GATOR-4B</td>
<td>8929AR-254</td>
<td>R3B-GATOR</td>
<td>8322AR-318D</td>
<td>OG3-FR, OGX-FR</td>
</tr>
</tbody>
</table>

Notice — Installing the GATOR-TOOLBOX in a frame other than the OG3-FR or OGX-FR could damage the card, the rear module, or both. The GATOR-TOOLBOX must be installed in a -CN or -CNS frame. It is not supported on -C frames using the MFC-8322-S controller card.

Main PCB Overview

The main PCB is a typical openGear card. An ejector on one end secures the card to the slot inside the openGear frame, and the other end inserts into a connector on the back of the rear module.

Reset Button

Pressing this button resets the microprocessor and re-initializes the card. This is a hard reset of the card. This action should only be before as advised by Ross Video Technical Support.

Reference Termination Jumper (J3)

JP3 is a 3-position jumper block used to configure the 75ohm termination on the local reference input of the rear module. Refer to Figure 5 for pin positions.
• **Pin 1** (bottom) + **Pin 2** (center) — This is the default position. The reference is terminated with a 75ohm resistor. This position is used for point-to-point cabling, or on the last card of a daisy chain topology.

![Figure 5 J3 — Default Position](image)

• **Pin 2** (center) + **Pin 3** (top) — The 75ohm termination is removed and the reference is not terminated. This configuration is used in a daisy chain cabling topology where only the last card is terminated.

**Micro SD Card Slot**

The Micro SD card slot is located on the backside of the main PCB and just above the ejector.

* Ensure the Micro SD card is properly seated in its slot before installing the GATOR-TOOLBOX.

**Supported Rear Modules**

This section provides an overview of the rear module cabling for each GATOR-TOOLBOX system.

**R3A-GATOR Rear Module**

The R3A-GATOR rear module occupies four slots and accommodates one card. (Figure 6) The following connections are available:

- 4 SDI inputs on HD-BNCs
- 4 SDI outputs on HD-BNCs
- 6 GPIO connections
- 8 AES unbalanced connections on HD-BNCs
- 1 independent reference input signal (bi-level or tri-level sync)

![Figure 6 Cabling Designations — R3A-GATOR](image)
**R3B-GATOR Rear Module**

The R3B-GATOR rear module occupies four slots and accommodates one card. *(Figure 6)* The following connections are available:

- 4 SDI inputs on HD-BNCs
- 4 SDI outputs on HD-BNCs
- 6 GPIO connections
- 8 AES balanced connections on 3-pin connectors
- 1 independent reference input signal (bi-level or tri-level sync)

![Cabling Designations — R3B-GATOR](image)

**R4-GATOR Rear Module**

*Notice* — Installing the R4-GATOR in a frame other than the OGX-FR could damage the card, the rear module, or both.

The R4-GATOR rear module occupies two slots and accommodates one card. *(Figure 8)* The following connections are available:

- 4 SDI inputs on HD-BNCs
- 4 SDI outputs on HD-BNCs
- 4 GPIO connections
- 1 independent reference input signal
R4F-GATOR Rear Module

**Notice** — Installing the R4F-GATOR in a frame other than the OGX-FR could damage the card, the rear module, or both.

The R4F-GATOR rear module occupies two slots and accommodates one card. *(Figure 9)* The following connections are available:

- 1 dedicated SDI input on HD-BNC
- 1 dedicated SDI input on fiber optic port
- 1 dedicated SDI output on HD-BNC
- 1 dedicated SDI output on fiber optic port (refer to the chapter “Supported SFP Modules”)
- 2 bi-directional SDI HD-BNCs
- 4 GPIO connections
Physical Installation

Installing an GATOR-TOOLBOX card into the openGear frame requires you to remove the blank plates in the designation frame slots, install the required rear module into the frame rear panel, and then install the GATOR-TOOLBOX card into the required frame slot.

If you have questions pertaining to the installation of GATOR-TOOLBOX, contact us at the numbers listed in “Contacting Technical Support”. Our technical staff is always available for consultation, training, or service.

For More Information on...
• the technical specifications for the GATOR-TOOLBOX, refer to “Technical Specifications”.

Before You Begin
These installation guidelines assume the following:
• Ensure the openGear frame is properly installed. Refer to the User Guide for your frame.
• A valid IP addresses is available for the GATOR-TOOLBOX.
• If the rear module is already installed in the openGear frame, proceed to “Installing the GATOR-TOOLBOX Card into an openGear Frame”.

Static Discharge
Throughout this chapter, please heed the following cautionary note:

ESD Susceptibility — Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling circuit boards in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Always exercise proper grounding precautions when working on circuit boards and related equipment.

Removing the Blank Plates from the Rear Panel
When a frame slot is not populated with an openGear card, a blank plate must be installed to ensure proper frame cooling and ventilation.

Notice — Installing the 8323AR-325 or 8323AR-327 rear modules in a frame other than the OGX-FR could damage the card, the rear module, or both.

To remove a blank plate from the openGear frame
1. Locate the slots in the openGear frame you wish to install the GATOR-TOOLBOX into.
2. If you are using an 8322AR-319C, it is recommended to use the following slot combinations:
   • Slots 1, 2, 3, 4   • Slots 13, 14, 15, 16
   • Slots 5, 6, 7, 8   • Slots 17, 18, 19, 20
   • Slots 9, 10, 11, 12
3. If you are using an 8323AR-325 or an 8323AR-327 it is recommended to use the following slot combinations:
   - Slots 1, 2
   - Slots 3, 4
   - Slots 5, 6
   - Slots 7, 8
   - Slots 9, 10
   - Slots 11, 12
   - Slots 13, 14
   - Slots 15, 16
   - Slots 17, 18
   - Slots 19, 20

4. Use a Phillips screwdriver to unfasten each blank plate from the openGear backplane.
5. Remove each blank plate from the chassis and set aside.

**Installing the Rear Module into the openGear Frame**

If the rear module is already installed in the openGear frame, proceed to “Installing the GATOR-TOOLBOX Card into an openGear Frame”.

**To install a rear module into the openGear frame**

1. For each retaining screw on the rear module, push the o-ring to the end of the screw (but not off the screw). This will help to align the rear module to the frame backplane in step 3.

2. Seat the bottom of the rear module in the seating slots at the base of the openGear frame’s backplane.

3. Align the top holes of the rear module with the screw holes on the top-edge of the frame backplane.

4. Using a Phillips screwdriver and the provided screw, fasten the rear module to the backplane.

   - Do not fully tighten the screws until after installing the card and you have verified that the GATOR-TOOLBOX card aligns with the rear module.
Installing the GATOR-TOOLBOX Card into an openGear Frame

The slot the GATOR-TOOLBOX installs into depends on the slot combination you installed the rear module in. This allows adequate spacing to avoid damaging the card, the cards installed in the neighboring slots, or both.

Refer to **Table 2** for valid slot combinations when using the 8322AR-319C or 8323AR-327 rear module.

<table>
<thead>
<tr>
<th>Rear Module is Installed in</th>
<th>Card Installs into Slot</th>
<th>Daughter Card Installs into Slot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slots 1, 2, 3, 4</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Slots 5, 6, 7, 8</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Slots 9, 10, 11, 12</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Slots 13, 14, 15, 16</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Slots 17, 18, 19, 20</td>
<td>18</td>
<td>20</td>
</tr>
</tbody>
</table>

**Table 2 Card Slot Combinations — 8322AR-319C, 8323AR-327**

Refer to **Table 3** for valid slot combinations when using the 8323AR-325 or 8323AR-327 rear module.

<table>
<thead>
<tr>
<th>Rear Module is Installed in</th>
<th>Card Installs into Slot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slots 1, 2</td>
<td>1</td>
</tr>
<tr>
<td>Slots 3, 4</td>
<td>3</td>
</tr>
<tr>
<td>Slots 5, 6</td>
<td>5</td>
</tr>
<tr>
<td>Slots 7, 8</td>
<td>7</td>
</tr>
<tr>
<td>Slots 9, 10</td>
<td>9</td>
</tr>
<tr>
<td>Slots 11, 12</td>
<td>11</td>
</tr>
<tr>
<td>Slots 13, 14</td>
<td>13</td>
</tr>
<tr>
<td>Slots 15, 16</td>
<td>15</td>
</tr>
<tr>
<td>Slots 17, 18</td>
<td>17</td>
</tr>
<tr>
<td>Slots 19, 20</td>
<td>19</td>
</tr>
</tbody>
</table>

**Table 3 Card Slot Combinations — 8323AR-325, 8323AR-327**

To install the GATOR-TOOLBOX into the openGear frame

1. Locate the slot the GATOR-TOOLBOX card will slide into.
2. Verify that the GATOR-TOOLBOX card aligns with the rear module.
3. Using a Phillips screwdriver fasten the rear module to the backplane using the provided screws.
   - Do not over tighten the screws.
4. Hold the card by the edges and carefully align the card edges with the slot rails in the frame.
5. Fully insert the card into the frame until the card is properly seated in the rear module.
Cabling

If you have questions pertaining to the installation of GATOR-TOOLBOX, contact us at the numbers listed in "Contacting Technical Support". Our technical staff is always available for consultation, training, or service.

★ The examples in this chapter depict the 8322AR-319C rear module. Your setup may differ from what is presented here.

For More Information on...
• the specifications for the GATOR-TOOLBOX, refer to “Technical Specifications”.

Cabling the Ethernet Port on the openGear Frame

The GATOR-TOOLBOX is connected to your network via the MFC-OG3-N or MFC-OGX-N in the openGear frame. This enables the GATOR-TOOLBOX to interface with other cards in the frame, and the computer running the DashBoard client. After a physical connection is established, DashBoard is used to configure the network settings for the GATOR-TOOLBOX.

★ The GATOR-TOOLBOX requires the MFC-OG3-N or MFC-OGX-N Network Controller card to be installed in the openGear frame. The MFC-8322-S does not support the GATOR-TOOLBOX.

★ You must provide an Ethernet connection to the openGear frame as outlined in the manual that accompanied your frame.

Before You Begin

Contact your IT department before connecting to your facility network to ensure that there are no conflicts. They will provide you with an appropriate value for the IP Address, Subnet Mask, and Gateway for your GATOR-TOOLBOX.

For More Information on...
• downloading and installing DashBoard, refer to the DashBoard User Guide.
• configuring the Ethernet port on the openGear frame, refer to the OGX-FR Series User Guide.
★ Contact your network administrator if problems are experienced when connecting to a network hub.

Cabling for the Reference Input for an GATOR-TOOLBOX

The openGear frame provides two reference input connections that the GATOR-TOOLBOX can use as a reference source. Refer to the User Guide for your openGear frame to learn more about cabling these ports.

The rear module also includes a REF IN HD-BNC that can assigned as a local reference input.

★ This section is not applicable when using the 8323AR-327 rear module.

For More Information on...
• specifying the reference source for your card, refer to the chapter “Reference Setup”.

To connect a reference source to the GATOR-TOOLBOX rear module
1. Connect one end of a cable to the REF IN HD-BNC on the GATOR-TOOLBOX rear module.
2. Connect the other end of the same cable to the applicable output port on the external reference source device.
Video Signal Cabling

Each rear module provides connections for SDI inputs and SDI outputs. The number of inputs and outputs is dependent on the rear module model you are using.

SDI Inputs

Connect your input video signals to the SDI IN HD-BNCs on the rear module as required. (Figure 12)

SDI Outputs

Connect your destination devices to the SDI OUT HD-BNCs on the rear module as required. (Figure 13)
Getting Started

This chapter provides instructions for launching DashBoard, and accessing the GATOR-TOOLBOX interfaces in DashBoard.

If you have questions pertaining to the operation of GATOR-TOOLBOX, contact us at the numbers listed in “Contacting Technical Support”. Our technical staff is always available for consultation, training, or service.

Before You Begin

Ensure that:

• An MFC-OG3-N or MFC-OGX-N Network Controller Card is installed in your OGX-FR frame.
• The openGear frame that houses the GATOR-TOOLBOX displays in the Basic Tree View of DashBoard.
• The GATOR-TOOLBOX displays as a sub-node in the OGX-FR frame tree.
• Your facility IT Department provided the required network settings to be assigned to the GATOR-TOOLBOX.

Launching DashBoard

DashBoard must run on a computer that has a physical wired Ethernet connection. Wireless connections do not allow device discovery.

For More Information on...

• downloading and installing the DashBoard client software, refer to the DashBoard User Manual.
• the GATOR-TOOLBOX interfaces in DashBoard, refer to “DashBoard Interface Overview”.

To launch DashBoard

1. Ensure that you are running DashBoard software version 9.2.0 or higher.
2. Launch DashBoard by double-clicking its icon on your computer desktop.

Configuring the Initial Network Settings

Once the GATOR-TOOLBOX is physically installed and cabled to your facility network, you will need to assign it an initial IP Address in order to gain full access to the card menus, options, and status fields in DashBoard. Establishing an initial IP Address enables DashBoard to communicate with the GATOR-TOOLBOX and update the Basic Tree View with the GATOR-TOOLBOX sub-node.

* This procedure requires a reboot of the card.

To assign the initial network settings for the GATOR-TOOLBOX

1. Launch DashBoard.
2. Expand the OGX-FR frame node to display a list of cards installed in that frame.
3. Double-click the GATOR-TOOLBOX node under the frame node.
   The Network interface displays in DashBoard.
4. Select the Network tab.
5. Use the Mode menu to select Static.
6. Use the Static IP Address field to assign a unique IP Address to the GATOR-TOOLBOX card.
7. Use the **Subnet Mask** field to assign the subnet mask for the card.

8. Use the **Gateway** field to specify the gateway for communications outside of the local area network (LAN) the card will use.

9. Click **Apply**.
   The card is temporarily taken off-line during the reboot of the card to apply the new settings.

10. Verify the new network settings as follows:
    a. Close the **Network** interface.
    b. Refresh the Basic Tree View.
    c. Expand the OGX-FR frame node to display a list of sub-nodes.
    d. Verify that the GATOR-TOOLBOX displays as seen in the example below.

---

### Accessing the GATOR-TOOLBOX Interfaces in DashBoard

The interfaces are accessed by expanding the GATOR-TOOLBOX sub-node in the DashBoard Tree View.

**To access the GATOR-TOOLBOX interfaces in DashBoard**

1. Launch DashBoard.

2. In the Basic Tree View of DashBoard, locate the openGear frame the GATOR-TOOLBOX is installed in.

3. Expand the openGear frame node to display a list of sub-nodes.

4. Locate the GATOR-TOOLBOX node in the openGear frame tree.

5. Expand the GATOR-TOOLBOX node to display a list of sub-nodes for the card.
   In the following example, the user expanded the GATOR-TOOLBOX-B node in Slot 6.

   ![Example Tree View](image)

   The first sub-node provides access to the **Global** settings for the card while each subsequent sub-node represents interfaces for configuring the features of the GATOR-TOOLBOX.

6. Double-click the **Global** sub-node to display that interface in the right pane of the DashBoard window.

   - If the **Global** sub-node is not available, the Network Settings are not properly configured. Open the Card page and it will present the Network Settings page.

   There are two sets of tabs in the Global interface: Status (on the left), and Configuration (on the right). Use the tabs on the right to configure settings that impact the entire card (such as network settings, enabling licensed features, and enabling alarm reporting). Refer to “**Global Interface**” for a summary of the available menus and read-only fields in this interface.
7. Double-click the **Gator Toolbox** sub-node to display the interface for that feature in the right pane of the DashBoard window.

The area on the left displays read-only fields that report the overall status of the inputs. The area on the right provides options to configure specific features of the card. Refer to **“GATOR-TOOLBOX Interfaces”** for a summary of the available menus and read-only fields in this interface.
Configuring the Network Settings

This chapter outlines how to update the network settings assigned to the GATOR-TOOLBOX.

If difficulties or problems are experienced when assigning IP addresses, contact your network administrator.

Before You Begin

Ensure that:

- The OGX-FR frame that houses the GATOR-TOOLBOX displays in the Basic Tree View of DashBoard
- An MFC-OG3-N Network Controller Card installed in your OGX-FR frame
- The GATOR-TOOLBOX displays as a sub-node in the OGX-FR frame tree
- You have contacted your facility IT Department for the required settings to be assigned to the GATOR-TOOLBOX

Changing the Network Settings of the GATOR-TOOLBOX

Once you have established connection to the card, you may want to change the IP Address from the default setting to one that was provided by your IT Department.

Ross Video recommends using a static IP Address.

To change the network settings for the GATOR-TOOLBOX

1. Display the Global interface as outlined in “To access the GATOR-TOOLBOX interfaces in DashBoard”.
2. Select the Network tab.
3. If you are manually configuring the Ethernet settings for the GATOR-TOOLBOX:
   a. Use the Mode menu to select Static.
   b. Use the Static IP Address field to specify the new static IP Address for the GATOR-TOOLBOX. This is the address the card will use within the OGX-FR frame.
   c. Use the Subnet field to specify the subnet mask for your network.
   d. Use the Static Gateway field to specify the gateway for communications outside of the local area network (LAN) the card will use.
4. If you want the network settings to be automatically obtained, select DHCP from the Mode menu.
5. Click Apply to save the new settings.

The GATOR-TOOLBOX card reboots automatically.
Licensed Features

The GATOR-TOOLBOX has software licenses for enabling functions and features of the card. This chapter outlines the available software licensed features, and how to install a software key for a licensed feature.

License Keys Overview

Table 4 provides a brief summary on the types of licensed features available for the GATOR-TOOLBOX.

<table>
<thead>
<tr>
<th>License</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GATOR TOOLBOX+UHD</td>
<td>Enables 2160p video formats including 6G-SDI, 12G-SDI, and Quad-link</td>
</tr>
<tr>
<td>GATOR TOOLBOX+FRC</td>
<td>Enables format conversion</td>
</tr>
<tr>
<td>GATOR TOOLBOX+HDR-LUT</td>
<td>Enables 3D-LUT transforms for HDR conversion</td>
</tr>
</tbody>
</table>

Installing a License Key

Ross Video uses license keys to control user access to specific GATOR-TOOLBOX features. You can obtain a key for a GATOR-TOOLBOX licensed feature from Ross Video Technical Support.

To install a license key
1. Display the Global interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Configure Licenses tab.
3. Make a note of the character string in the Request Code field for the feature you wish to enable.
4. Contact Ross Video using the information found in “Contacting Technical Support”.
   a. When you speak to your Technical Support representative, tell them your name, your facility name, and the Request Code from the Configure Licenses tab.
   b. You will be given a License Key that must be entered in the applicable field in the Licenses table.
5. Enter the provided License Key in the applicable Key field in the Configure Licenses tab.
6. Click Apply in the row for the License Key you entered in step 5.

Removing a License Key

Disabling a License Key removes user access to the GATOR-TOOLBOX features associated with that License Key.

* To re-enable the features, you will need to contact Ross Technical Support and request a new License Key.
To remove a GATOR-TOOLBOX license key

1. Display the Global interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Configure Licenses tab.
3. Click in the Key field for the licensed feature you want to remove.
4. Type remove.
5. Click Apply to remove the license.
Reference Setup

The procedures in this chapter assume that the GATOR-TOOLBOX interface displays in the right-pane of the DashBoard window.

Frame Rate Compatibility

The GATOR-TOOLBOX video output frame rate must match the frame rate of the selected reference frame rate. Table 5 outlines the GATOR-TOOLBOX frame rate compatibility.

* It is recommended to use an interlaced analog or digital reference when using an interlaced video output format, with both running at the same frame rate.

Table 5  Reference/SDI Output Format Compatibility

<table>
<thead>
<tr>
<th>Reference Format</th>
<th>SDI Video Output Formata</th>
</tr>
</thead>
<tbody>
<tr>
<td>1080p 23.98Hz</td>
<td>1080p 23.98Hz</td>
</tr>
<tr>
<td></td>
<td>2160p 23.98Hz</td>
</tr>
<tr>
<td>1080p 24Hz</td>
<td>1080p 24Hz</td>
</tr>
<tr>
<td></td>
<td>2160p 24Hz</td>
</tr>
<tr>
<td>1080pSF 23.98Hz, 1080pSF 24Hz</td>
<td>1080pSF 23.98Hz</td>
</tr>
<tr>
<td></td>
<td>1080pSF 24Hz</td>
</tr>
<tr>
<td>576i 50Hz, 1080i 50Hz</td>
<td>720p 50Hz</td>
</tr>
<tr>
<td></td>
<td>1080i 50Hz</td>
</tr>
<tr>
<td></td>
<td>1080p 25Hz</td>
</tr>
<tr>
<td></td>
<td>1080p 50Hz</td>
</tr>
<tr>
<td></td>
<td>2160p 25Hz</td>
</tr>
<tr>
<td></td>
<td>2160p 50Hz</td>
</tr>
<tr>
<td>720p 50Hz, 1080p 50Hz</td>
<td>720p 50Hz</td>
</tr>
<tr>
<td></td>
<td>1080p 50Hz</td>
</tr>
<tr>
<td></td>
<td>2160p 50Hz</td>
</tr>
<tr>
<td>480i 59.94Hz, 1080i 59.94Hz</td>
<td>720p 59.94Hz</td>
</tr>
<tr>
<td></td>
<td>1080i 59.94Hz</td>
</tr>
<tr>
<td></td>
<td>1080p 29.97Hz</td>
</tr>
<tr>
<td></td>
<td>1080p 59.94Hz</td>
</tr>
<tr>
<td></td>
<td>2160p 29.97Hz</td>
</tr>
<tr>
<td></td>
<td>2160p 59.94Hz</td>
</tr>
<tr>
<td>720p 59.94Hz, 1080p 59.94Hz</td>
<td>720p 59.94Hz</td>
</tr>
<tr>
<td></td>
<td>1080p 59.94Hz</td>
</tr>
<tr>
<td></td>
<td>2160p 59.94Hz</td>
</tr>
</tbody>
</table>
Specifying a Global Reference Source

There are four options to select an external analog or digital reference source: Frame 1, Frame 2, Local, and Input SDI. Once selected, the GATOR-TOOLBOX video output timing will be locked to that reference source.

The Local option is not applicable when using the 8323AR-327 rear module as this module does not provide a REF IN connection.

It is possible to offset the GATOR-TOOLBOX video output timing relative to the selected reference with the Horizontal Delay and the Vertical Delay options in DashBoard. Refer to “Adjusting the Output Timing” for details.

To specify a global reference source for the GATOR-TOOLBOX

1. Display the Global interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Setup tab.
3. Use the Reference Source options to specify the source for the reference input signal.

To lock properly, the reference frame rate and the video output frame rate should be in a ratio of 1:1 or 1:2.

Monitoring the Reference Signal via DashBoard

The reference signal must be stable at all time. Any reference signal disruptions will cause the GATOR-TOOLBOX video output to re-lock with severe display artifacts.

The status of the GATOR-TOOLBOX may be monitored via its fields in the DashBoard client software or the LEDs located on the front panel of the chassis.

In the case of a reference signal loss, the Ref Status field in DashBoard will report “Unlocked” and the GATOR-TOOLBOX video output will free-run.

To configure the reference alarm for the GATOR-TOOLBOX

1. Display the Global interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Global Alarm Enables tab.
3. Select the Reference Format box to enable the Card state status field, located in the top left corner of the Global interface, to report when the reference signal is not detected.

### Table 5  Reference/SDI Output Format Compatibility

<table>
<thead>
<tr>
<th>Reference Format</th>
<th>SDI Video Output Format&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>480i 60Hz, 1080i 60Hz</td>
<td>720p 60Hz</td>
</tr>
<tr>
<td></td>
<td>1080i 60Hz</td>
</tr>
<tr>
<td></td>
<td>1080p 60Hz</td>
</tr>
<tr>
<td></td>
<td>2160p 60Hz</td>
</tr>
<tr>
<td>720p 60Hz, 1080p 60Hz</td>
<td>720p 60Hz</td>
</tr>
<tr>
<td></td>
<td>1080p 60Hz</td>
</tr>
<tr>
<td></td>
<td>2160p 60Hz</td>
</tr>
</tbody>
</table>

<sup>a</sup> UHD formats require the GATOR TOOLBOX+UHD license. Refer to “Licensed Features” for details.
Basic Video Configuration

This chapter outlines how to specify the output format and video source, adjust the timing, and summarizes what the card will do during a loss of the input signal.

Mapping the GATOR-TOOLBOX I/O

The GATOR-TOOLBOX enables you to configure the inputs and outputs as Single Link, or Quad Link (2SI or SQD).

To assign an I/O Mapping mode

1. Display the Global interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Setup tab.
3. Locate the IO Mapping area.
4. In the Inputs row, specify how to map the GATOR-TOOLBOX inputs. Choose from the following:
   - Single Link — The GATOR-TOOLBOX ingests one signal per SDI IN port. This is the default.
   - Quad Link: 2SI — The GATOR-TOOLBOX ingests four 3Gbps Level A 2SI signals. Refer to “Configuring 2SI Quad Link”.
   - Quad Link: SQD — The GATOR-TOOLBOX ingests four 3Gbps SQD signals. Refer to “Configuring SQD Quad Link”.
   - Fiber — The GATOR-TOOLBOX ingests one 12Gbps signal via the SDI IN connection of SFP 1 and outputs one 12Gbps via the SDI OUT connection of SFP 1. The Output Mapping is automatically set to Single Link and cannot be changed. This option only displays when using the 8323AR-327 rear module.
5. In the Outputs row, specify how to map the GATOR-TOOLBOX outputs. Choose from the following:
   - Single Link — The GATOR-TOOLBOX outputs a single SDI signal on each SDI OUT port. This is the default.
   - Quad Link: 2SI — The GATOR-TOOLBOX outputs four 3Gbps Level A 2SI signals. Refer to “Configuring 2SI Quad Link”.
   - Quad Link: SQD — The GATOR-TOOLBOX outputs four 3Gbps SQD signals. This option is unavailable when the Input Mapping field is set to Quad Link: SQD. Refer to “Configuring SQD Quad Link”.

Video Input Setup

By default, the GATOR-TOOLBOX card provides a Loss of Input Failover feature where the user can manually switch from the primary SDI input signal to a secondary (backup) SDI input signal. You have the option to configure the card so that it stays on the backup SDI input signal until you manually switch the card back to the primary signal, or to enable the card to automatically switch.

* On manual failover, the card will perform a clean/quiet switch if both SDI inputs are stable and the same video format.

Specifying the Primary and Backup Video Sources

You can specify which SDI video signal (Input 1, 2, 3, or 4) is the primary and backup using the options in the GATOR-TOOLBOX > Config tab.
This feature is only available when the Input Mapping mode is set to Single Link or Fiber.

To specify the primary and backup video sources
1. Display the GATOR-TOOLBOX interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Config tab.
3. Locate the Video Input area of the tab.
4. Click Configure Loss of Input.
   The Loss of Input dialog opens.

5. Use the Primary Input menu to specify an SDI input signal as the primary signal for the Loss of Input Failover mode.

   You cannot assign the same SDI signal as both the Primary Input and the Backup Input.

6. Use the Backup Input menu to specify an SDI input signal as the backup signal for the Loss of Input Failover mode.

Loss of Input Failover Mode
There are two Loss of Input Failover modes: automatic or manual. By default, the card automatically switches the signals from primary to secondary when a loss of input occurs. Or, you can choose to configure the card to wait until the user decides to manually switch the signals by clicking.

To define the behavior of the Loss of Input Failover mode
1. In the Loss of Input dialog, locate the Auto-Return options.

2. Use the Auto-Return options to specify whether the card automatically returns to the Primary Input source when a valid signal is detected (Yes), or whether the user must manually perform the switch (No).

3. In the Loss of Input dialog, locate the Force Failover options.
4. Use the **Force Failover** options to determine when the failover occurs. Choose from the following:

- **Normal** — When a loss of input occurs, the card automatically switches to the other video source.
- **Forced** — The user manually switches to the other video source by toggling the **Return to** button (located at the bottom of the **Loss of Input** dialog).

**To enable Failover mode and switch the SDI input signals**
1. In the **Loss of Input** dialog, locate the **Loss of Input Failover** options.
2. Click **ON**.
   
   The **ON** button automatically is lit (active) and the card switches from one signal to the other.

**To manually force a switch between SDI input signals**
1. In the **Loss of Input** dialog, ensure the **Force Failover** is set to **Forced**.
2. Toggle the **Return to** button.
   
   The input signal is switched and the button updates to display one of the following labels:
   - **Return to Primary** — When the button displays this label, the card is using the Backup input signal. Clicking this button again switches the input to the Primary signal.
   - **Return to Backup** — When the button displays this label, the card is using the Primary input signal. Clicking this button again switches the input to the Backup signal.

**Verifying the Active SDI Input Signal**

You can monitor the primary and backup SDI input signals via the **Input Status** tab in DashBoard.

**To verify the current active SDI input signal**
1. Display the GATOR-TOOLBOX interface as outlined in “**Accessing the GATOR-TOOLBOX Interfaces in DashBoard**”.
2. Select the **Input Status** tab.
3. Locate the **Loss of Input Failover Status** area of the tab.
4. Use the **Primary Input** field to determine which SDI input signal is assigned as the Primary Input Video Source.
5. Use the **Backup Input** field to determine which SDI input signal is assigned as the Backup Video Source.
6. Use the **Active Input** field to determine which SDI input signal is currently active and in use.
   
   - The embedded audio will also go silent if passing from input to output (when another audio source is not selected).

**Video Output Setup**

You can specify the video format and video source for the card output. If required, options are provided to adjust the output timing by adding delays.
**Specifying the Output Format**

You need to specify the video format for the card output.

**To specify the output format for your card**

1. Display the GATOR-TOOLBOX interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the **Config** tab.
3. From the **Output Format** menu, select the video format.
   
   The output must be compatible with the selected reference. Refer to “Reference Setup”.

**Specifying the Output Video Source**

You need to specify the video source for the output signal.

**To specify the output video source for your card**

1. Display the GATOR-TOOLBOX interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the **Config** tab.
3. Use the **Output Video Source** to specify the signal the GATOR-TOOLBOX will output. Choose from the following:
   - **Video in** — The output uses the video input signals.
   - **Test Pattern** — A SMPTE bars test pattern will replace all of the output picture (but not the HANC and VANC).

**Adjusting the Output Timing**

You can choose to add a horizontal delay, vertical delay, or both to the output.

The output timing is set by default from the MFC-OG3-N or MFC-OGX-N that is installed in the same openGear frame. This setting is displayed in the **Network** tab.

**To adjust the timing**

1. Display the GATOR-TOOLBOX interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the **Config** tab.
The Delay sliders in the Config tab affect all outputs.

3. Use the **Horizontal Delay** to specify the horizontal delay in pixels, relative to the selected reference.

4. Use the **Vertical Delay** to specify the vertical delay in lines, relative to the selected reference.
Configuring 2SI Quad Link

GATOR-TOOLBOX is compatible with multiple transport methods commonly used to carry UHD video content. In single-link mode, the GATOR-TOOLBOX can accept 11.88Gbps SDI as per SMPTE 2082-10. In Quad Link 2SI mode, the GATOR-TOOLBOX can accept quad-link 3G SDI as per SMPTE 425/5. This chapter outlines how to configure the GATOR-TOOLBOX to accept these standards.

The GATOR-TOOLBOX Gearbox function manages the two sample interleave (2SI) format of quad-link.

Gearbox Overview

Keep the following in mind when configuring the GATOR-TOOLBOX Gearbox feature:

- When you enable a Gearbox input, GATOR-TOOLBOX multiplexes the signals of the four 3Gbps Level A channels together. All audio and ancillary data used for processing originates from Link 1.
- When you enable a Gearbox output, GATOR-TOOLBOX ingests a signal (either 12G UHD single-link or a 4x3Gbps 2SI quad-link) and then outputs a 4x3Gbps 2SI quad-link UHD signal. All audio and ancillary data is inserted on Link 1 except for SMPTE ST 352 which is inserted on all links.
- Input failover is not available when the GATOR-TOOLBOX Gearbox In feature is enabled.

Timing

GATOR-TOOLBOX Gearbox requires all four of the input signals be within 350ns of each other. Cable lengths to the Gearbox input should be as matched as practicable.

For More Information on...
- the cable length specifications, refer to “Technical Specifications”.

UHD Transport Overview

The most common application of a Gearbox is a Quad Link SDI setup at 3G per coax SMPTE ST 424. The GATOR-TOOLBOX supports the 2SI and SQD methods.

Two Sample Interleave (2SI)

The GATOR-TOOLBOX can apply the 2 Sample Interleave (2SI) method where four sub-images are used to alternate sampling every 2 pixels and every line. This is the preferred method as it is defined in all UHDTV specifications.

![Figure 14  Representation of 2SI Sampling](Image)
Input Gearbox
All audio and ancillary used for processing will originate from link 1.

Output Gearbox
When you enable the Output 2SI gearbox, the GATOR-TOOLBOX will map a UHD signal as an 3Gbps Level A output. All audio and ancillary will be inserted on link 1 except for SMPTE ST-352 which will be inserted on all links.

Configuring the GATOR-TOOLBOX for Multiplexing 2SI Quad Link
This section outlines the steps required to enable the GATOR-TOOLBOX to multiplex four 3Gbps input signals into a 12Gbps output signal.

For More Information on...
- the SDI cabling for your rear module, refer to the appropriate section in “Supported Rear Modules”.

To set up a physical connection between the GATOR-TOOLBOX and the external devices
1. Connect the SDI IN BNCs on the GATOR-TOOLBOX rear module to the device that will supply the four 3Gbps input signals to be multiplexed.
2. Connect the SDI OUT 1 BNC on the GATOR-TOOLBOX rear module to the external device that will receive the 12Gbps signal.

To enable multiplexing of four 3Gbps inputs to a UHD Gearbox group
1. Display the Global interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Setup tab.
3. Locate the Gearbox area of the tab.
4. In the Gearbox In row click Quad Link: 2SI.
5. In the Gearbox Out row click Single Link.

Configuring the GATOR-TOOLBOX for De-multiplexing a 12Gbps Signal
The GATOR-TOOLBOX is capable of de-multiplexing a 12Gbps SDI sources into four separate 3Gbps SDI output signals.

For More Information on...
- the SDI cabling for your rear module, refer to the appropriate section in “Supported Rear Modules”.

To set up a physical connection between the GATOR-TOOLBOX and the external devices
1. Connect the SDI IN 1 BNC on the GATOR-TOOLBOX rear module to the external device that will provide the 12Gbps signal.
2. Connect the SDI OUT BNCs on the GATOR-TOOLBOX rear module to the external device that will receive the four 3Gbps signals.
To assign the de-multiplexed signals to a Gearbox group
1. Display the Global interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Setup tab.
3. In the Gearbox In row click Single Link.
4. In the Gearbox Out row click Quad Link: 2SI.

Configuring the GATOR-TOOLBOX for 2SI Quad Link Inputs and Outputs

The GATOR-TOOLBOX is capable of ingesting a quad-link signal and then feeding that signal to an external device. This is especially useful for downstream equipment that require a quad-link feed.

For More Information on...
• the SDI cabling for your rear module, refer to the appropriate section in “Supported Rear Modules”.

To set up a physical connection between the GATOR-TOOLBOX and the external devices
1. Connect the four SDI IN BNCs on the GATOR-TOOLBOX rear module to the device that will supply the quad-link signals.
2. Connect the SDI OUT BNCs on the GATOR-TOOLBOX rear module to the external device that will receive the quad-link signals.

To set up a quad-link input and output on the GATOR-TOOLBOX
1. Display the Global interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Setup tab.
3. In the Gearbox In row click Quad Link: 2SI.
4. In the Gearbox Out row click Quad Link: 2SI.
Configuring SQD Quad Link

There are two different ways of performing a quad link: Square Division Quad Split and 2 Sample Interleave (SI). This chapter provides information on the SQD feature of the GATOR-TOOLBOX.

* This chapter assumes that you have configured the Ethernet and timing settings, as well as receivers/senders for your GATOR-TOOLBOX.

* Input failover is not available when the GATOR-TOOLBOX Gearbox In feature is enabled.

What is Square Division Quad Split (SQD)?

SQD is a Quad Link method introduced to produce a UHD image. Each stream contains one quarter of the original image. (Figure 15) Each quarter image is displayed at HD 1920x1080 resolution, and then quadrants are reassembled to create a full UHD image.

How does SQD differ from 2 Sample Interleave (2SI)?

In 2SI, the entire image is interleaved across the four streams, so each stream looks like a lower-resolution version of the original image. The four streams are then combined to create one 3840x2160 image.

Configuring the GATOR-TOOLBOX for Multiplexing Quad Link SQD

This section outlines the steps required to enable the GATOR-TOOLBOX to multiplex four 3Gbps SQD input signals into a 12Gbps 2SI output signal.

For More Information on...

• the SDI cabling for your rear module, refer to the appropriate section in “Supported Rear Modules”.

To set up a physical connection between the GATOR-TOOLBOX and the external devices

1. Connect the SDI IN BNCs on the GATOR-TOOLBOX rear module to the device that will supply the four 3Gbps input signals to be multiplexed.

2. Connect the SDI OUT 1 BNC on the GATOR-TOOLBOX rear module to the external device that will receive the 12Gbps signal.
To enable multiplexing of four 3Gbps inputs to a UHD Gearbox group
1. Display the Global interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Setup tab.
3. Locate the Gearbox area of the tab.
4. In the Gearbox In row click Quad Link: SQD.
5. In the Gearbox Out row click Single Link.

Configuring the GATOR-TOOLBOX for De-multiplexing a 12Gbps Signal

The GATOR-TOOLBOX is capable of de-multiplexing a 12Gbps SDI sources into four separate 3Gbps SDI output signals.

For More Information on...
• the SDI cabling for your rear module, refer to the appropriate section in “Supported Rear Modules”.

To set up a physical connection between the GATOR-TOOLBOX and the external devices
1. Connect the SDI IN 1 BNC on the GATOR-TOOLBOX rear module to the external device that will provide the 12Gbps signal.
2. Connect the SDI OUT BNCs on the GATOR-TOOLBOX rear module to the external device that will receive the four 3Gbps signals.

To assign the de-multiplexed signals to a Gearbox group
1. Display the Global interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Setup tab.
3. In the Gearbox In row click Single Link.
4. In the Gearbox Out row click Quad Link: SQD.

* The GATOR-TOOLBOX cannot perform SQD Gearbox on input and output simultaneously.
Configuring the GPI/Tallies

This chapter outlines how to configure each GPI/Tally independently on the GATOR-TOOLBOX.

* The number of available GPIO ports depends on the rear module you are using. The 8322AR-318D and 8322AR-319C rear modules each provide 6 GPIO ports. The 8323AR-325 and 8323AR-327 rear modules each provide 4 GPIO ports.

GPI Communication Setup

When configured as a GPI, a port behaves as an input, and can be used to trigger actions such as Cut/Dissolve the Key and/or Background. A push-button switch, or an ON-OFF switch, may be directly connected between the port and the adjacent ground pin. Alternatively, an external device may drive a low level. Minimum pulse duration is 1ms, anything shorter will be filtered out.

Typically, users will configure the GPI for Edge trigger. This means that the action is carried out either on the falling edge (button is pushed), or rising edge (button is released), depending on which Polarity is selected. Alternatively, users may configure the GPI for Level trigger. In this mode, the action is carried out on both the rising and falling edges, so there are effectively two states. The Polarity control can be used to invert the behavior. Regardless of the trigger type, GPI commands may be overridden by other command inputs such as serial protocols.

The Edge options enable the GPI to act as a latching trigger. Edge triggers are used when you want to toggle between settings. This option enables the GPI to execute a specific function.

- If configured for Edge Falling, the selected function is executed when the GPI input signal transitions from High to Low.
- If configured for Edge Rising, the selected function is executed when the GPI input signal transitions from Low to High.
- Edge triggered GPI signals are sampled once per frame and the associated function is executed only once per frame. The minimum pulse width is 1 millisecond.
- Typically, the edge triggered GPI is driven by external equipment that generates one pulse per event.

Level triggers are used when you want to assert a particular state for a setting. You define the on-air state of the function as being either Level High or Level Low. Therefore, if the on-air state of the Key is defined as Level High for example, when the GPI is a Level High signal, the Key will stay on air. If a Level Low is received, the Key will be taken off air.

- If configured for Level Low, the selected function is executed when the GPI input signal is driven Low.
- If configured for Level High, the selected function is executed when the GPI input signal is driven High.

Configuring a Port as a GPI

Each port can be configured independently from the others, allowing you to customize the function of each connection.

To configure a port as a GPI

1. Display the GATOR-TOOLBOX interface as outlined in the procedure “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the GPI/Tally tab.
3. Use the **Function** menu to assign a transition event to a specific GPI port.

4. Use the **Trigger/Tally Type** menu to select a trigger and polarity for the GPI.

5. If the **Trigger/Tally Type** is set to **Falling** or **Rising**, use the **Output Pulse Width** menu to specify the number of frames the pulse will be for an edge trigger.

6. Use the **Manual Override** and **Level** options in conjunction to override a GPI.
   a. Select the **Manual Override** box for a GPI/Tally.
   b. Toggle the **Level** button.

### Tally Communication Setup

When configured as a Tally, a port becomes an output, providing a status indicator. Typically this is used to indicate which input(s) are on-air at any given moment. Each tally output on the card can be configured to be active when any of the inputs are on air. They can be configured as Level High or Level Low. Edge triggered tallies generate a pulse to the configure polarity (high or low) for a duration of 30 frames or the duration of the event (whichever is shorter). The tally outputs defaults to a logical high level when inactive. When the tally becomes active, for example the signal is on-air, then the output is driven low.

#### To configure a port as a tally

1. Display the GATOR-TOOLBOX interface as outlined in the procedure “**Accessing the GATOR-TOOLBOX Interfaces in DashBoard**”.

2. Select the **GPI/Tally** tab.

3. Use the **Function** menu to specify what will drive the tally output when the input is on-air.

4. Use the **Trigger/Tally Type** menu to select the polarity of the tally.

5. If the **Trigger/Tally Type** is set to **Falling** or **Rising**, use the **Output Pulse Width** menu to specify the number of frames the pulse will be for an edge trigger.

6. Use the **Manual Override** and **Level** options in conjunction to override a tally.
   a. Select the **Manual Override** box for a GPI/Tally.
   b. Toggle the **Level** button.
Format Converter Setup

This chapter provides instructions for configuring the Format Converter licensed feature using the menus in DashBoard.

Overview

The GATOR-TOOLBOX converts any video input format to any video output format, running at the same frame rate. A license is not required for frame rate conversion when the frame rate ratio is 1.001 or 1/1.001. For example, converting 1080p24Hz to 1080p23.98Hz does not require a license.

When the input frame rate does not match the output frame rate, the GATOR TOOLBOX+FRC license is required to enable the Format Converter options. This license enables the GATOR-TOOLBOX to perform frame rate conversion from/to 23.98Hz, 24Hz, 25Hz, 29.97Hz, 30Hz, 50Hz, 59.94Hz, and 60Hz.

For More Information on...

- enabling the GATOR TOOLBOX+FRC license, refer to “Licensed Features”.
- the supported formats for conversion by the GATOR-TOOLBOX, refer to “Supported Formats for Conversion”.

Format Converter Setup

Once the GATOR TOOLBOX+FRC license is enabled, the options on the Format Converter tab are editable.

To configure the format converter settings

1. Display the GATOR-TOOLBOX interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Format Converter tab.
3. In the Cadence Detection area, select the Enable box.
   - If the input is detected with the proper cadence, the GATOR-TOOLBOX will allow conversion from 23.98/24Hz formats.
4. If you are converting any HD or 3G source to any output format (including 2160p outputs), use the Vertical Detail Enhancement and Horizontal Detail Enhancement sliders to adjust the filtering during conversion.
   - The sliders are ignored when format conversion is not required (the input format matches the output format). The video input signal is passed without modification.
SDR/HDR Conversion

This chapter provides information on the SDR/HDR conversion features of the GATOR-TOOLBOX.

For More Information on...
- enabling the GATOR TOOLBOX+HDR-LUT license, refer to “Installing a License Key”.

Overview

The GATOR-TOOLBOX provides the following SDR/HDR conversion features as standard:
- Built-in HDR/SDR conversion
- Selecting a Tone Mapping mode
- SDI output Y/C clipper to pass/clip extended super-black or super-white ranges
- RGB Color Correction

The GATOR TOOLBOX+HDR-LUT license is required for the following features:
- Independent ProcAmp controls for the video input and for the video output.
- SDI output Y/C clipper to pass/clip extended super-black or super-white ranges.
- SDR/HDR transfer characteristic and colorimetry information inserted into the SDI video output 352M payload identifier.
- Import and apply 3D-LUT RGB Cube files
- Access the NBCU and BBC 3D-LUT libraries (pre-loaded RGB LUT files)

The following sub-sections outline specific features of the GATOR TOOLBOX+HDR-LUT license.

Built-in SDR/HDR Conversion

The GATOR-TOOLBOX supports dynamic range and color gamut conversion from/to any of these standards:
- BT.709 SDR
- BT.2020 SDR
- BT.2020 HLG
- BT.2020 PQ
- BT.2020 S-Log3

The video input dynamic range and color gamut settings can be manually configured or can be automatically detected from the SDI video input 352M payload identifier.

The video output dynamic range and color gamut settings can be manually configured or can be automatically set to follow the SDI video input dynamic range and color gamut.

The SDR/HDR conversion also offers the following options:
- Display light or scene light conversion
- Direct mapping or tone (up/down) mapping
- RGB Color Correction with adjustment controls for gamma, lift, gain, and offset
SDR/HDR Conversion with 3D-LUT RGB Cube Files

The GATOR-TOOLBOX also supports SDR/HDR conversion with a 33x33x33 3D-LUT RGB cube files including:

- BT.709 and BT.2020 color gamut for Y/C RGB conversion
- Preloaded 3D-LUT RGB Cube files library from BBC (17 files) and NBCU (6 files)
- Ability to load 33x33x33 3D-LUT RGB Cube files to perform custom conversions
- Support for Narrow Range (Type I) and Full Range (Type III) 3D-LUT RGB Cube files

Accessing the SDR/HDR Conversion Settings

The SDR/HDR conversion settings are accessed via the DashBoard Video Correction tab.

**To display the SDR/HDR Conversion tab**

1. Display the GATOR-TOOLBOX interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Video Correction tab.
   
   The SDR/HDR Conversion sub-tab is automatically selected.

Bypassing the Video Correction Settings

You can choose to bypass the video correction setting by clicking Normal (located in the top right corner of the Video Correction tab). Note that Normal is the default state of this button.

When clicked, the button is lit red and the label changes to Bypass. (Figure 16)
When this button displays the label **Normal**, the GATOR-TOOLBOX is processing the video input through the ProcAmps, the SDR/HDR converter, and the RGB Color Corrector and performing the target transform.

When this button displays the label **Bypass**, the GATOR-TOOLBOX is passing through the video input without modifications. Refer to “Bypass Alarm” for more details.

**Dynamic Range and Color Gamut Setup**

The GATOR-TOOLBOX performs the SDR/HDR dynamic range and color gamut conversion as specified in the **SDI Input** and **SDI Output** areas of the Video Corrections tab. (Figure 17 and Figure 18).

The default SDI Input > Input Color Gamut > Follow Upstream setting automatically extracts the dynamic range and colorimetry information from the SDI video input 352M payload identifier and adjusts the SDR/HDR conversion accordingly.

![Figure 17 Example of the Video Correction > SDI Input Area](image1)

The default SDI Output > Output Color Gamut > Follow Input setting automatically follows the dynamic range and colorimetry information as defined in the SDI Input area. In that case no SDR/HDR conversion is performed but the other video processing featured such as the ProcAmps and the RGB Color Correction are still available.

![Figure 18 Example of the Video Correction > SDI Output Area](image2)

The other options are common to both the **SDI Input** and the **SDI Output** and are used to force a specific SDR/HDR conversion. The following common options are available:

- BT.709 SDR — HD color gamut, Standard Dynamic Range
- BT.2020 SDR — UHD wide color gamut, Standard Dynamic Range
- BT.2020 HLG — UHD wide color gamut, Hybrid Log-Gamma dynamic range
- BT.2020 PQ — UHD wide color gamut, Perceptual Quantizer dynamic range
- BT.2020 S-LOG3 — UHD wide color gamut, Sony ® S-Log3 dynamic range

* An alarm is generated if the dynamic range and colorimetry information extracted from the SDI video input 352M payload identifier does not match the specific SDR/HDR conversion as defined by the user.
ProcAmps Setup

The GATOR-TOOLBOX offers two independent ProcAmps. The **Input ProcAmp** is located upstream of the SDR/HDR conversion and the **Output ProcAmp** is located downstream of the SDR/HDR conversion. Both ProcAmps offer the same controls.

<table>
<thead>
<tr>
<th>Input ProcAmp</th>
<th>Output ProcAmp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Offset</td>
<td>Black Offset</td>
</tr>
<tr>
<td>Gain</td>
<td>Gain</td>
</tr>
</tbody>
</table>

*Figure 19  Example of the Input ProcAmp and Output ProcAmp Settings*

**Black Offset**

This control adjusts the Luma (Y) black offset of the SDI input or output streams. The value is reported as a percentage of the full black to white signal amplitude with an adjustment range from -20% to +20%, in steps of 0.1%.

★ The black offset adjustment is applied before the gain adjustment.

**Gain**

This control adjusts the Luma and Chroma (Y/C) gain of the SDI input or output streams. The value is reported in dB with an adjustment range from -20dB to +20dB, in steps of 0.01dB.

★ The gain adjustment is applied after the user’s black offset adjustment.

**Built-In SDR/HDR Conversion Setup**

The GATOR-TOOLBOX features a build-in SDR/HDR Conversion engine, calculating on-the-fly the conversion specified in the **SDI Input** and **SDI Output** areas, and loading the internal 33x33x33 3D-LUT tetrahedral interpolator hardware with the calculated transform. The built-in SDR/HDR Conversion engine is enabled when the **Tone Mapping** option is selected in the **Conversion** area.

*Figure 20  Example of the Tone Mapping Settings*

**Selecting a Tone Mapping Conversion Option**

The Tone Mapping feature provides two SDR/HDR conversion light options: Display Light or Scene Light.

**Display Light**

The common reference for the transform is the visible light as emitted by a display monitor. When set to Display Light conversion, the GATOR-TOOLBOX:
1. Uses the EOTF of the SDI input dynamic range and color gamut to convert the SDI input electrical signal to the Display Light units.

2. Uses the inverse EOTF of the SDI output dynamic range and color gamut to convert the Display Light units to the SDI output electrical signal.

Scene Light
The common reference for the transform is the visible light as diffused by the ambient scene. When set to Scene Light conversion, the GATOR-TOOLBOX:

1. Uses the inverse EOTF of the SDI input dynamic range and color gamut to convert the SDI input electrical signal to Scene Light units.

2. Uses the EOTF of the SDI output dynamic range and color gamut to convert the Scene Light units to the SDI output electrical signal.

Selecting a Conversion Mapping Option
The GATOR-TOOLBOX built-in SDR/HDR conversion mapping options are:

- Direct Mapping
- ITU-R BT.2446 Method A
- ITU-R BT.2446 Method B
- ITU-R BT.2446 Method C

![Figure 21 Example of Selecting a Conversion Mapping Option](image)

Direct Mapping
The Direct Mapping option performs a straight conversion, without dynamic range compression or expansion, and without color gamut compression or expansion. This means that when a HDR input stream is converted to an SDR output stream, all HDR source pixels that are outside the output SDR dynamic range or color gamut will be clipped, losing luminance and/or color information.

ITU-R BT.2446 Methods A, B, C Tone Mapping and Inverse Tone Mapping
The GATOR-TOOLBOX built-in SDR/HDR Conversion engine provides three mapping methods as defined in ITU-R BT.2446. These offer tone mapping for HDR to SDR down-conversions and inverse tone mapping methods for SDR to HDR up-conversions.

The three methods (A, B, and C) exhibit different features that are intended primarily for different applications:

- Method A — Graded content, including movies, ads, episodic content.
- Method B — Live broadcast, with compensation for SDR over exposed bright area.
- Method C — Live broadcast, with the conversion robust to round-tripping.

For more details, refer to the Report ITU-R BT.2446 Methods for conversion of high dynamic range content to standard dynamic range content and vice-versa.
SDR/HDR Conversion with 3D-LUT RGB Cube Files

The GATOR-TOOLBOX SDR/HDR built-in conversion engine offers limited tone mapping and inverse tone mapping options. To expand the capability of the GATOR-TOOLBOX, Ross Video offers a set of pre-loaded 3D-LUT RGB cube files, each one designed to meet specific conversion requirements. It is also possible for the user to load custom 33x33x33 3D-LUT RGB cube files for specific applications.

When the user configures the GATOR-TOOLBOX to perform the SDR/HDR conversion using a 3D-LUT RGB cube file, then the proprietary SDR/HDR transform is natively programmed into the 3D-LUT file. In that case, the user still needs to configure correctly the DashBoard SDI Input and the SDI Output options as the BT.709 or BT.2020 colorimetry information are required by the GATOR-TOOLBOX to:

- convert the Y/C to RGB values,
- drive the RGB 3D-LUT input, and then
- convert the RGB 3D-LUT output back to Y/C.

Loading a 3D-LUT RGB Cube File

The DashBoard RGB Cube File option allows to select and load one RGB Cube file stored locally on the GATOR-TOOLBOX.

![Image](image.png)

**Figure 22 Example of Selecting an RGB Cube File to Upload**

The Scan Files button will read and list all the files found in the root directory and in the sub-directories, listing all the pre-loaded BBC and NBCU cube files libraries and any custom cube files already loaded by the user. Selecting one cube file from the list will automatically load and apply it.

- Loading a RGB Cube File disables the DashBoard Tone Mapping options Display/Scene light and Direct/Tone Mapping Methods.

Specifying the 3D-LUT RGB Cube File Type

A 3D-LUT Cube File is designed to process a specific input/output signal range. The DashBoard option Range provides two processing signal ranges:

- Type I – Normal Range [64,940]
- Type III – Full Range [0,1023]

- The pre-loaded 3D-LUT RGB cube files library, most BBC cube files, and all NBCU cube files are of Type III.

![Image](image.png)

**Figure 22 Example of Selecting an RGB Cube File to Upload**

The Scan Files button will read and list all the files found in the root directory and in the sub-directories, listing all the pre-loaded BBC and NBCU cube files libraries and any custom cube files already loaded by the user. Selecting one cube file from the list will automatically load and apply it.

- Loading a RGB Cube File disables the DashBoard Tone Mapping options Display/Scene light and Direct/Tone Mapping Methods.

Specifying the 3D-LUT RGB Cube File Type

A 3D-LUT Cube File is designed to process a specific input/output signal range. The DashBoard option Range provides two processing signal ranges:

- Type I – Normal Range [64,940]
- Type III – Full Range [0,1023]

- The pre-loaded 3D-LUT RGB cube files library, most BBC cube files, and all NBCU cube files are of Type III.

The Type I Normal Range scales the SDI input signal level [64,940] to drive the 3D-LUT input processing range [0,1023] and will scale the 3D-LUT output processing range [0,1023] back to the SDI output signal level [64,940]. This means that a Type I 3D-LUT Cube file will clip super-blacks or
super-whites on the SDI input and will not be able to generate super-blacks or super-whites on the SDI output.

The **Type III Full Range** will drive the full 10-bit SDI input signal level directly to the 3D-LUT input processing range \([0, 1023]\) and will scale the 3D-LUT output processing range \([0, 1023]\) to the SDI output signal level \([0, 1023]\). This means that a Type III 3D-LUT Cube file will be able to process super-blacks and super-whites on the SDI input and will be able to generate super-blacks and super-whites on the SDI output.

To allow super-blacks or super-whites on the SDI video output stream, the **Video Output Clipping** option must be set to the **Extended Luma \([4, 1019]\)** range.

![Figure 23  Example of Selecting a Range for the RGB Cube File](image)

As described above, the functionality of the **Type I Normal Range** 3D-LUT RGB Cube File is a subset of the functionality of the **Type III Full Range**. For that reason, most applications will be using the **Type III Full Range** 3D-LUT RGB Cube File.

**Pre-Loaded RGB Cube Files Library**

With the GATOR TOOLBOX+HDR-LUT license, the GATOR-TOOLBOX provides a library of pre-loaded 3D-LUT RGB cube files from the BBC and NBCU.

**3D-LUT RGB Cube Files from BBC**

These 3D-LUT files are designed and copyrighted by the BBC and are available under license. A sub-set of the BBC 3D-LUT files are pre-loaded in the GATOR-TOOLBOX as part of the GATOR TOOLBOX+HDR-LUT license. Refer to **Table 6** for details on the available files.

<table>
<thead>
<tr>
<th>BBC LUT #</th>
<th>Conversion and Filename Info</th>
</tr>
</thead>
</table>
| 1        | BT.2100 PQ 1000 cd/m² to BT.2100 HLG, Type III  
File: BBC/ 1e_PQ1000_HLG_Type3_Transcode_nocomp-v1.5.cube |
| 2        | BT.2100 PQ 4000 cd/m² to BT.2100 HLG, Type III  
File: BBC/ 2e_PQ4000_HLG_Type3_Transcode_nocomp-v1.5.cube |
| 3        | BT.709 SDR to BT.2100 HLG direct-mapping, Type I, display-light  
File: BBC/ 3a_BT709_HLG_Type1_Display_DirectMapping_nocomp-v1.5.cube  
BT.709 SDR to BT.2100 HLG direct-mapping, Type III, display-light  
File: BBC/ 3c_BT709_HLG_Type3_Display_DirectMapping_nocomp-v1.5.cube |
| 4        | BT.709 SDR to BT.2100 HLG direct-mapping, Type III, scene-light  
File: BBC/ 4-1a_BT709_HLG_Type3_Scene_DirectMapping_nocomp-v1.5.cube |

**Table 6 Pre-loaded 3D-LUT RGB Cube Files — BBC**
Table 6 Pre-loaded 3D-LUT RGB Cube Files — BBC

<table>
<thead>
<tr>
<th>BBC LUT #</th>
<th>Conversion and Filename Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>BT.709 SDR to BT.2100 HLG up-mapping, Type III, display-light</td>
</tr>
<tr>
<td></td>
<td>File: BBC/ 5c_BT709_HLG_Type3_Display_UpMapping_nocomp-v1.5.cube</td>
</tr>
<tr>
<td>6</td>
<td>BT.709 SDR to BT.2100 HLG up-mapping, Type III, scene-light</td>
</tr>
<tr>
<td></td>
<td>File: BBC/ 6-2a_BT709_HLG_Type3_Scene_UpMapping_nocomp-v1.5.cube</td>
</tr>
<tr>
<td>7</td>
<td>BT.2100 HLG to BT.2100 PQ 1000 cd/m², Type III</td>
</tr>
<tr>
<td></td>
<td>File: BBC/ 7c_HLG_PQ1000_Type3_Transcode_nocomp-v1.5.cube</td>
</tr>
<tr>
<td>8</td>
<td>BT.2100 HLG to BT.709 SDR down-mapping, Type III, display-light</td>
</tr>
<tr>
<td></td>
<td>File: BBC/ 8c_HLG_BT709_Type3_Display_DownMapping_nocomp-v1.5.cube</td>
</tr>
<tr>
<td>9</td>
<td>BT.2100 HLG to BT.709 SDR down-mapping, Type III, display-light, with SDR super-whites</td>
</tr>
<tr>
<td></td>
<td>File: BBC/ 9c_HLG_BT709_Type3_Display_DownMapping_SuperWhite_nocomp-v1.5.cube</td>
</tr>
<tr>
<td>10</td>
<td>BT.2020 S-Log3 to BT.2100 HLG, Type II, scene-light (use DashBoard Type III option)</td>
</tr>
<tr>
<td></td>
<td>File: BBC/ 10a_S-Log3-100pc_HLG_Type2_Scene_Transcode_nocomp-v1.5.cube</td>
</tr>
<tr>
<td>11</td>
<td>&quot;SR Live&quot; S-Log3 to BT.2100 HLG, Type II, scene-light (use DashBoard Type III option)</td>
</tr>
<tr>
<td></td>
<td>File: BBC/ 11a_S-Log3-200pc_HLG_Type2_Scene_Transcode_nocomp-v1.5.cube</td>
</tr>
<tr>
<td>12</td>
<td>BT.2100 HLG to BT.709 SDR down-mapping, Type III, scene-light</td>
</tr>
<tr>
<td></td>
<td>File: BBC/ 12-1c_HLG_BT709_Type3_Scene_DownMapping_nocomp-v1.5.cube</td>
</tr>
<tr>
<td></td>
<td>BT.2100 HLG to BT.709 SDR down-mapping, Type III, scene-light, clean source without graphics</td>
</tr>
<tr>
<td></td>
<td>File: BBC/ 12-2c_HLG_BT709_Type3_Scene_DownMapping_nocomp-v1.5.cube</td>
</tr>
<tr>
<td>17</td>
<td>BT.2020 SDR to BT.2100 HLG direct-mapping, Type III, display-light, graded content</td>
</tr>
<tr>
<td></td>
<td>File: BBC/ 17c_BT2020_HLG_Type3_DirectMapping_nocomp-v1.5.cube</td>
</tr>
<tr>
<td>18</td>
<td>BT.2020 SDR to BT.2100 HLG up-mapping, Type III, display-light, graded content</td>
</tr>
<tr>
<td></td>
<td>File: BBC/ 18c_BT2020_HLG_Type3_Display_UpMapping_nocomp-v1.5.cube</td>
</tr>
<tr>
<td>19</td>
<td>BT.2100 HLG to BT.2100 HLG Traditional Camera Look, Type III</td>
</tr>
<tr>
<td></td>
<td>File: BBC/ 19c_HLG_Camera_to_TraditionalLook_Type3_Conversion_nocomp-v1.5.cube</td>
</tr>
</tbody>
</table>

3D-LUT RGB Cube Files from NBCU

These 3D-LUT files are designed and copyrighted by the NBC Universal (NBCU) and are publicly available free of use. A sub-set of the NBCU 3D-LUT files are pre-loaded in the GATOR-TOOLBOX as part of the GATOR TOOLBOX+HDR-LUT license. Refer to Table 7 for details on the available files.

Table 7 Pre-loaded 3D-LUT RGB Cube Files — NBCU

<table>
<thead>
<tr>
<th>NBCU LUT #</th>
<th>Conversion and Filename Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BT.709 SDR to BT.2100 HLG, Type III, display-light, direct-mapping</td>
</tr>
<tr>
<td></td>
<td>File: NBC/ 1-NBCU_SDR2HLG_DL_v1.1.cube</td>
</tr>
</tbody>
</table>
Loading Custom RGB Cube Files

The GATOR TOOLBOX+HDR-LUT license also offers the possibility of loading third-party or custom made 33x33x33 RGB Cube files directly into the GATOR-TOOLBOX local directory. Once loaded, the files are saved internally in non-volatile storage and can be recalled anytime to fulfill the requirements of specific SDR/HDR conversions.

3D-LUT Cube File Format

The three-dimensional RGB Cube file is a text file following the format defined in the Cube LUT Specification Version 1.0 document from Adobe Systems Inc. The GATOR-TOOLBOX product supports only the 33x33x33 three-dimensional table LUT data. In other words, the file must have the keyword "LUT_3D_SIZE" set to 33.

No Matrix Compensation

The GATOR-TOOLBOX does not require 3D-LUT Cube files with matrix compensation as this product has all the build-in hardware to do the BT.709 or BT.2020 color gamut conversion on the SDI video input and on the SDI video output. You must then select and use only the third-party 3D-LUT Cube files that were created "Without Compensation Matrix".

Conversion Types I, II, and III

When browsing into third-party offering of 3D-LUT Cube files library, you will often encounter the option for conversions Type I, Type II and Type III. The Type III 3D-LUT Cube Files are the recommended type to be used with the GATOR-TOOLBOX product.

- **Type I** — intended for software applications and older hardware-LUT devices that operate over the nominal SDI signal range [64,940]. They do not process super-blacks or super-whites. The GATOR-TOOLBOX has the option to support these files but it is recommended the use the Type III 3D-LUT Cube Files if possible.
- **Type II** — intended for SDI input signals that require full-range processing, like Sony's S-Log3. The GATOR-TOOLBOX does not support the Type II 3D-LUT Cube files.
- **Type III** — intended for hardware 3D-LUT devices that process narrow-range SDI signal [64,940], but operate over the full 10-bit signal range [0,1023]. These files offer the headroom to process super-blacks and super-whites without clipping. The Type III 3D-LUT Cube Files are the recommended type to be used with the GATOR-TOOLBOX product.

<table>
<thead>
<tr>
<th>NBCU LUT #</th>
<th>Conversion and Filename Info</th>
</tr>
</thead>
</table>
| 2          | BT.709 SDR to BT.2100 HLG, Type III, display-light, up-mapping  
File: NBC/ 2-NBCU_SDR2HLG_SL_v1.cube |
| 3          | BT.2100 HLG to BT.709 SDR, Type III, display-light, down-mapping  
File: NBC/ 3-NBCU_HLG2SDR_DL_v1.1.cube |
| 4          | BT.709 SDR to BT.2100 PQ, Type III, display-light, up-mapping  
File: NBC/ 4-NBCU_SDR2PQ_DL_v1.cube |
| 5          | BT.2100 PQ to BT.709 SDR, Type III, display-light, down-mapping  
File: NBC/ 5-NBCU_PQ2SDR_DL_v1.cube |
| 7          | BT.2100 HLG 1000 cd/m² to BT.2100 PQ, Type III, display-light  
File: NBC/ 7-NBCU-HLG2PQ_1000nit_v1.cube |
Loading a 3D-LUT Cube File to the GATOR-TOOLBOX

The 3D-LUT cube files are transferred to and from the GATOR-TOOLBOX using FTP protocol. The files are stored on the Micro SD card that is installed on the GATOR-TOOLBOX. You must load the files to the Micro SD card, before importing to the GATOR-TOOLBOX Video Correctors.

✦ When using Mac OS X™ to transfer files to the Micro SD card via an FTP server, you may only have read-only access. Refer to your Mac OS X™ documentation for details.

Keep the following in mind before loading your 3D-LUT files:
- The directory for your 3D-LUT files must be only 1 folder deep.
- The filename must include the 3D-LUT file extension.

Connection using FTP

You can use an FTP connection to transfer 3D-LUT files to and from the Micro SD card of the GATOR-TOOLBOX. You can also use an FTP client to delete files on the Micro SD card.

Before accessing the GATOR-TOOLBOX via FTP:
1. Ensure the GATOR-TOOLBOX link status is valid. This information is reported in the Global > Network > Link Status field in DashBoard.
2. The default login credentials are:
   - User Name — user
   - Password — password

Using the Micro SD Card

The following tips and restrictions apply when using the Micro SD card:
- the GATOR-TOOLBOX must be powered down to install or remove the Micro SD card.
- if you must remove the Micro SD card for programming, re-boot the GATOR-TOOLBOX when you re-install the Micro SD card. This allows the GATOR-TOOLBOX to recognize that a new card is available.

SDI Video Output Clipping Setup

The GATOR-TOOLBOX provides the options to enable or clip super-blacks and super-whites on the SDI video output Luma (Y') stream. Super-blacks are often found in common color bar test patterns such as the ITU-R BT.814 HDR PLUGE and others. Super-whites may be created when down converting HDR to SDR, where the HDR highlights will be mapped in the 100% to 109% SDR super-white range. Super-blacks and super-whites can also be created with the ProcAmp’s gain and offset controls.

Figure 24 shows the Output Clipping > Y’ settings.

![Output Clipping](image)

Figure 24 Example of Video Correction > SDR/HDR Conversion > Output Clipping

✦ An option to allow extended Chroma (Cb'/Cr') is also available but will rarely be used in practice to maintain interoperability with other equipment.
RGB Color Correction

This section outlines the controls that the GATOR-TOOLBOX provides to perform basic RGB color correction.

The Color Correction functions are not available when the user selects to perform an SDR/HDR conversion with an 3D-LUT RGB Cube file. Refer to “SDR/HDR Conversion with 3D-LUT RGB Cube Files” for details.

Overview

Under the DashBoard Video Correction tab, the Color Correction sub-tab provides several controls to perform basic RGB color correction functions. (Figure 25)

To display the Color Correction tab

1. Display the GATOR-TOOLBOX interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Video Correction tab.
3. Select the Color Correction sub-tab.

Controls are available for the grouped RGB’ and for individual R’, G’, and B’ components. The color correction processing is performed downstream of the SDR/HDR 3D-LUT conversion engine, and as indicated by the prime symbol, in the nonlinearly coded (gamma-corrected) components of the video output.

The RGB Color Corrector processing functions are cumulative and are executed in this sequence:

1. Gamma In — applies a Gamma function to the RGB’ stream.
2. Black Offset — adjusts the black offset of the RGB’ stream. The unit is in percentage of the full black to white signal amplitude with an adjustment range from -20% to +20%, in steps of 0.1%.
3. Gain — adjusts the gain of the RGB’ stream. The unit is in dB with an adjustment range from -20dB to +20dB, in steps of 0.01dB.
4. Black Lift — lifts the black level of the RGB’ stream, while applying a gain to keep the peak white at the same level. The unit is in percentage of the full black to white signal amplitude with an adjustment range from -20% to +20%, in steps of 0.1%.
5. Gamma Out — applies an inverse Gamma function to the RGB’ stream.
Monitoring the Color Conversion

Under the DashBoard Video Correction tab, the Alarms sub-tab has three options to enable or disable alarm notifications related to color conversion. In all cases, the alarm event information is always reported inside the top left Status text box, only the green indicator will turn yellow if the alarm is enabled.

![Figure 26 Example of the Video Correction > Alarms Options](image)

Bypass Alarm

When enabled, this option will raise a DashBoard alarm notification whenever the Video Correction is bypassed. As a reminder, all the Video Correction settings are bypassed after the top-right button is clicked and is then lit red and labeled Bypass. (Figure 27)

![Figure 27 Example of Bypassing the Video Correction Settings](image)

Input Mismatch Alarm

When enabled, this option will raise a DashBoard alarm notification whenever the SDR/HDR dynamic range and the BT.709 / BT.2020 colorimetry information decoded in the SDI video input 352M payload identifier does not match the option selected in the SDI Input area of the Video Correction > SDR/HDR Conversion sub-tab.

Cube File Alarm

When enabled, this option will raise a DashBoard alarm notification whenever there was a problem loading the user specified 33x33x33 3D-LUT RGB Cube File. The most common error condition will simply be that there is no file specified by the user, that the Select File option is set to the default [None] in the Video Correction > SDR/HDR Conversion sub-tab.
Ancillary Data

Ancillary Data (ANC) is the non-video data that can be embedded within the SDI signal, such as audio, audio metadata, timecode, closed caption data, AFD, and payload identification. This chapter provides an overview of ANC processing for the GATOR-TOOLBOX.

* This chapter assumes the GATOR-TOOLBOX1 interface displays in the DashBoard window as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.

Overview

There are two areas in which ancillary data may be found:

- **HANC** — ANC packets that are found in the horizontal blanking region.
- **VANC** — ANC packets that are found in the vertical blanking region.

This section outlines how to view incoming status in the **Input Status** tab and configure the GATOR-TOOLBOX to manage HANC and VANC data using the options in the **ANC** tab of DashBoard.

HANC and VANC Status

The **Input Status** tab in DashBoard provides HANC and VANC status details:

- **Embedded Audio** — These fields indicate the information extracted from the channel status, such as PCM/Non-PCM, 20bit or 24bit. If there is PCM data, a level in dB is also displayed. When this field is blank, the packet for the specified group is absent. Refer to Table 20 for status message details.
- **ST 352 Upstream** — This field indicates whether the 352M data is detected on the input, and displays the four bytes.
- **AFD, Closed Captioning, Timecode, Compressed Audio Metadata, SCTE-104, Other** — These fields indicate the status of the specified packet, such as whether it is detected or not on the input. Where each message includes the following information:
  - **Field #** — indicates which field the timecode was detected in (e.g. Field 1 (Odd))
  - **Type** — indicates the type of timecode (e.g. ATC-VITC1)
  - **Line #** — indicates the specific line the timecode data was detected in (e.g. 16)
  - **Location** — indicates timecode is in the HANC (H), or VANC (<blank>)
  - **Channel** — indicates timecode is in the luma (L), or chroma (C) channel

CEA-708/CEA-608 Closed Captioning

When disabled, closed captioning (packet and line 21) is not inserted. Otherwise, this section summarizes the closed caption processing of the card.

The GATOR-TOOLBOX card:

- ensures continuity of CEA-608 data and/or DTVCC data during frame drop or repeat.
- receives the packet, processes it, and inserts a new packet into the specific line.
- monitors the CDP sequence number of incoming CEA-708 data to detect discontinuities in the DTVCC transport stream, and propagates any sequence-number discontinuity to the outgoing DTVCC data, to alert downstream equipment of the change.
Captioning Priority

There are two supported types of closed captioning data: native CEA-708, and CEA-608 embedded in CEA-708. The order of preference for output CEA-708 data is as follows:

1. CEA-708
2. Up-converted CEA-608 embedded in CEA-708

The order of preference for output CEA-608 data is as follows:

1. CEA-608 embedded in CEA-708
2. Null content

* CEA-708 is not down-converted to CEA-608.

The card decodes any CEA-708 caption distribution packets (CDP) from the input video and embeds the same data in the output video. The CDP is re-formatted as required based on the frame rate, to maintain the correct CEA-708 transport channel data rate (9600bps) as specified by SMPTE 334-2. The GATOR-TOOLBOX ignores any timecode information in the CDP. If there is no native CEA-708, then CEA-608 is translated to native CEA-708 DTVCC format, and embedded along with the original CEA-608 data in the output CDPs.

- CC1 is translated and encoded as DTVCC Service #1.
- CC3 is translated and encoded as DTVCC Service #2.
- CC2 and CC4 are not translated.
- such translation follows CEA-708-C section 8.11 and supports the standard character sets described in CEA-608-D section 6.4.1.

Other Data Types

This section provides additional information on other data types that the GATOR-TOOLBOX series manages.

Timecode

The user can specify whether timecode is passed or disabled:

- If the input is not synchronous to the output, select Disable from the Action menu of the ANC tab.
- If converting between progressive and interlaced, select Disable from the Action menu of the ANC tab.
- When pass is enabled, the timecode will be inserted in VANC (RP208) for SD outputs, and HANC (RP196) for all other formats.
- If the input is not synchronous to the output, data will be dropped (but not duplicated\(^1\)) as part of the frame sync behavior.

---

\(^1\) When a frame of video is duplicated, no packet is inserted in the duplicate frame.
Compressed Audio Metadata
Compressed Audio Metadata can be passed or disabled as follows:

- If the input is not synchronous to the output, select **Disable** from the **Action** menu of the **ANC** tab.
- If converting between progressive and interlaced formats, select **Disable** from the **Action** menu of the **ANC** tab.
- If the input is not synchronous to the output, data will be dropped (but not duplicated) as part of the frame sync behavior.

Other Packets
All remaining packets can be passed or disabled. When pass is enabled, the packets will be inserted in VANC on the specified line in the same order as they were received. If they do not fit on the specified line, they will continue on the next line. Approximately up to 250 packets, or 1500 bytes of data, can be passed this way. If the input is not synchronous to the output, data will be dropped (but not duplicated) as part of the frame sync behavior.

**Specific ANC Processing**
The **ANC** tab controls how ancillary data is inserted in the output when HANC and/or VANC pass through is not enabled.

**ANC Processing Overview**
For each packet type the user can control the insertion position.

**To configure the processing of specific ANC types**
1. Display the GATOR-TOOLBOX interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the **ANC** tab.
3. For each packet, select how the card processes the ANC data by selecting an option from the **Action** field.

* It is recommended to set the Time Code and Audio Metadata fields to Disable when converting between interlace and progressive video.
4. Specify the line to insert the ANC data packet as follows:
   • Use the Insertion Line menu to select a line to insert the specified ANC packet on. The default is 12 for each packet. Note that all packets are inserted in VANC, except for timecode in non-SD formats which are inserted in the HANC.
   • Note that if more than one packet is to be inserted in the same line, the packet with the lowest insertion order number will be inserted first.
5. Specify the insertion order for the data packet as follows:
   • Use the Insertion Order menu to define the hierarchy of the packets insertion.
   • Note that the lower the number, the higher priority the packet is given. For example, by default, the AFD packet is set to be inserted first (1), and Compressed Audio Metadata is inserted fourth (4).

**SMPTE ST 352 Packet Insertion**

You can choose where to insert the SMPTE ST-352 packets.

To configure the location of insert SMPTE ST-352 packets

1. Display the GATOR-TOOLBOX interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the ANC tab.
3. Locate the ST 352 Packet Insertion area of the tab.
4. Use the ST 352 Location options to determine where to insert the SMPTE ST-352 packets in the GATOR-TOOLBOX output.
   • The packets are automatically inserted before the audio packets.
Audio Configuration

This chapter provides instructions for configuring the audio features using the menus in DashBoard.

Configuring the AES Pairs

Before proceeding, ensure that you have made a note of the AES connections on your rear module. This information is required when assigning a function to each AES signal.

★ This section applies only to the GATOR-4A or GATOR-4B systems.

Selecting an AES Configuration

The GATOR-TOOLBOX enables you to configure the AES signals independently as inputs, outputs, or as a loopback.

To specify the AES configuration

1. Display the Global interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Setup tab.
3. Click Configure AES IO Mapping.
   The AES IO Mapping dialog opens.
4. Locate the AES signal you wish to configure.
5. Select one of the following:
   • Input — assigns the AES signal as an input. The associated AES connector on the rear module will receive discrete audio from an upstream source.
   • Output — assigns the AES signal as an output. The associated AES connector on the rear module will transmit discrete audio to the connected external device.
6. Repeat steps 4 and 5 for each AES signal you wish to configure.
7. Close the AES IO Mapping dialog.

Configuring the AES Outputs

This section briefly summarizes how to configure the AES outputs using the options in the Audio > AES tab.

To configure the AES outputs

1. Display the GATOR-TOOLBOX interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Audio tab.
3. Select the AES sub-tab.
4. Locate the column for the AES output you wish to configure.
5. Use the Audio Source options to assign a signal to channel 1 and 2 for the pair.
6. To set the gain for a channel of an AES output, use the associated Gain slider to select a value between -20dB and 20dB.
7. To set the delay for a channel of an AES output, use the associated Delay Offset slider to specify a value between 0ms and 500ms.
8. To invert a channel of an AES output, click the associated Invert button.
9. To sum the input (A+B/2) of the AES output, click the associated Sum button.
10. Repeat steps 4-9 for each AES output you wish to configure.

Processing the Embedded Audio Input

* When passing non-PCM data (e.g. Dolby E®), ensure that input and output are synchronous and all audio modifying settings (such as SRC, gain, and invert) are disabled or set to zero (0).

To set up processing of the embedded audio input
1. Display the GATOR-TOOLBOX interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Audio tab.
   The Embedded sub-tab is automatically selected.
3. To enable the SRC of the embedded audio, select the Sample Rate Conversion box.
4. To apply a gain to a channel, use the associated Ch # slider to select a value between -20dB and 20dB. Repeat for each channel you wish to configure.
5. To invert a channel, select the associated Ch # Invert box.

Mapping the Embedded Audio Channels

The embedded output channels are configured per processed input to allow different audio mapping that will track the currently processed input.

To map a channel
1. Display the GATOR-TOOLBOX interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Audio tab.
   The Embedded sub-tab is automatically selected.
3. From the associated Audio Source menu, select an audio source.
   In the example below, the user is assigning the source for SDI Ch 2.

* If the selected source is not present on the input video, silence is embedded.
* Channel status bits are only passed when a left/right pair are not separated. Otherwise, a standard channel status will be inserted. When channel status is passed, it may not reflect a change between 20bit and 24bit.
**To insert test tones**

1. Display the GATOR-TOOLBOX interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.

2. Select the **Audio** tab.
   
   The **Embedded** sub-tab is automatically selected.

3. From the associated **Audio Source** menu, select a test tone.
   
   In the example below, the user is assigning an 4kHz test tone to Channel 4.

![GATOR-TOOLBOX Interface](image)

**To mute a specific channel**

- Click **Mute**.
Using Presets

This chapter outlines how to store and recall a GATOR-TOOLBOX configuration using a Preset button on the Global interface in DashBoard.

* Presets are retained after a factory default is performed.

Overview

Up to eight presets can be defined, each capturing a unique GATOR-TOOLBOX configuration as required. These presets can then be recalled using the individual Preset buttons on the Global > Presets tab.

Table 8 summarizes the GATOR-TOOLBOX settings that are captured in a single preset.

<table>
<thead>
<tr>
<th>Tab</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gator Toolbox Interface</td>
<td></td>
</tr>
<tr>
<td>ANC</td>
<td>All editable menus</td>
</tr>
<tr>
<td>Audio</td>
<td>All editable menus</td>
</tr>
<tr>
<td>Config</td>
<td>All editable menus</td>
</tr>
<tr>
<td>Format Converter</td>
<td>Detail Enhancement &gt; Vertical</td>
</tr>
<tr>
<td></td>
<td>Detail Enhancement &gt; Horizontal</td>
</tr>
<tr>
<td>Input Status</td>
<td>All selectable boxes</td>
</tr>
<tr>
<td>Video Correction</td>
<td>SDR/HDR Conversion &gt; All editable menus</td>
</tr>
<tr>
<td></td>
<td>Color Correction &gt; All editable menus</td>
</tr>
<tr>
<td>Global Interface</td>
<td></td>
</tr>
<tr>
<td>Global Alarm Enables</td>
<td>All Alarm Enable boxes</td>
</tr>
<tr>
<td>Security</td>
<td>SSH Login</td>
</tr>
<tr>
<td>Setup</td>
<td>All editable menus</td>
</tr>
</tbody>
</table>

Storing a Preset

* Before proceeding ensure that the GATOR-TOOLBOX is configured how you want it for the preset.

To store your settings to a preset

1. Display the Global interface as outlined in “Accessing the GATOR-TOOLBOX Interfaces in DashBoard”.
2. Select the Preset tab.
3. Click the Preset button in the Select Presets area that you want to store the current configuration to.
4. In the text field of the Preset Actions area, type a unique identifier for the preset. This text will display as the button label.
5. Click **Store**.
   The settings are stored to the selected preset and name of the button updates.

**To edit a preset**
1. Update the GATOR-TOOLBOX configuration as required.
2. Select the **Global > Preset** tab.
3. Click the required **Preset** button.
4. Click **Store**.

**Recalling a Preset**
Recalling a preset applies the settings saved to that specific preset during the procedure “**To store your settings to a preset**”. Refer to Table 8 to learn which settings are captured in a preset.

**To recall a preset**
1. Display the Global interface as outlined in “**Accessing the GATOR-TOOLBOX Interfaces in DashBoard**”.
2. Select the **Preset** tab.
3. Click the **Preset** button that includes the settings you want to recall to the GATOR-TOOLBOX.
4. Click **Recall**.
   The selected button is lit and the configuration is recalled.
Upgrading the Software

The GATOR-TOOLBOX can be upgraded in the field via DashBoard.

**To upgrade the software on a card**

2. Ensure the Ethernet cable is connected to the **Ethernet** port on the openGear frame.
3. From the **Tree View**, expand the node for the GATOR-TOOLBOX you want to access.
4. Double-click the **Global** sub-node to display the interface in the right-half of DashBoard.
5. Select **Upload**, located near the bottom of the interface, to display the **Select file Upload** dialog.
6. Navigate to the *bin file you want to upload.
7. Click **Open**.
8. If you are upgrading a single card:
   a. Click **Finish** to start the upgrade.
   b. Proceed to step 10.
9. If you are upgrading multiple cards:
   a. Click **Next >** to display the **Select Destination** menu. This menu provides a list of the compatible cards.
   b. Specify the card(s) to upload the file to by selecting the check box(es) for the cards you want to upload the file to.
   c. Verify the card(s) you want to upload the file to. The **Error/Warning** fields indicate any errors, such as incompatible software or card type mismatch.
   d. Click **Finish**.
10. Monitor the upgrade.
    - An **Upload Status** dialog enables you to monitor the upgrade process.
    - Notice that each card is listed in the dialog with a  button. This button is replaced with a **Reboot** button once the software file is loaded to that card.

   🌟 Avoid clicking the individual Reboot buttons until all cards have successfully completed the file upload process and the OK button, located in the bottom right corner of the dialog, is enabled.
   - Click **OK** to reboot all the cards listed in the **Uploading to Selected Devices** dialog.
   - The **Reboot Confirm** dialog displays, indicating the number of cards that will reboot.
   - Click **Yes** to continue the upgrade process.

   🌟 Clicking **Cancel** or **No** returns you to the **Uploading to Selected Devices** dialog without rebooting the card(s).
   - The card(s) are temporarily taken off-line during the reboot process.
   - The process is complete once the status indicators for the **Card State** and **Connection** return to their previous status.
DashBoard Interface Overview

The DashBoard client software enables you to monitor, configure, and operate your GATOR-TOOLBOX. This chapter summarizes the interfaces, and tabs available in DashBoard for the GATOR-TOOLBOX.

Global Interface

The Global interface is accessed by double-clicking the Global sub-node in the GATOR-TOOLBOX tree. There are two distinct areas in the Global interface: Status (on the left), and Configuration (on the right).

![Figure 28  Example of the Global Interface](image)

Signal Tab

Table 9 summarizes the read-only fields displayed in the Signal tab.

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog Ref Status</td>
<td>OK (Green)</td>
<td>A valid signal is detected from the reference source device</td>
</tr>
<tr>
<td></td>
<td>Alarm suppressed (Green)</td>
<td>There are reference errors detected but the Global Alarm Enables &gt; Reference Error option is disabled (box is not selected)</td>
</tr>
<tr>
<td></td>
<td>Unsupported (Red)</td>
<td>An unsupported signal is detected from the reference source device</td>
</tr>
<tr>
<td></td>
<td>Unlocked (Red)</td>
<td>A valid or present reference signal is not detected by the card</td>
</tr>
<tr>
<td>Analog Ref Format</td>
<td>#</td>
<td>Reports the video format detected on the input reference signal as defined by the Setup &gt; Reference Source menu.</td>
</tr>
</tbody>
</table>

Inputs
Table 9  Signal Tab

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input # Format</td>
<td>#</td>
<td>A valid SDI signal is detected on the input, the format is supported, and the selected reference signal is supported and compatible</td>
</tr>
<tr>
<td></td>
<td>N/A</td>
<td>An invalid SDI signal is detected on the input</td>
</tr>
</tbody>
</table>

Outputs

<table>
<thead>
<tr>
<th>Output # Format</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>A valid SDI signal is detected on the output, the format is supported, and the selected reference signal is supported and compatible</td>
</tr>
<tr>
<td></td>
<td>N/A</td>
<td>An invalid SDI signal is detected on the output</td>
</tr>
</tbody>
</table>

Product Tab

Table 10 summarizes the read-only information displayed in the Product area.

Table 10  Product Tab

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
<td>GATOR-TOOLBOX</td>
<td></td>
</tr>
<tr>
<td>Supplier</td>
<td>Ross Video Ltd.</td>
<td></td>
</tr>
<tr>
<td>Board Rev</td>
<td>#</td>
<td>Indicates the hardware version</td>
</tr>
<tr>
<td>Serial Number</td>
<td>#</td>
<td>Indicates the serial number of the card</td>
</tr>
<tr>
<td>Rear Module</td>
<td>#</td>
<td>Indicates the rear module the card is installed in</td>
</tr>
<tr>
<td>Rear Module Status</td>
<td>OK (Green)</td>
<td>A supported rear module is installed with the card</td>
</tr>
<tr>
<td></td>
<td>Alarm suppressed (Green)</td>
<td>An unsupported rear module is installed by the Global Alarm Enables &gt; Incomp Rear Module option is disabled (box is not selected)</td>
</tr>
<tr>
<td></td>
<td>Incomp I/O Module (Red)</td>
<td>Card is connected to an unsupported rear module</td>
</tr>
<tr>
<td>Software Rev</td>
<td>#.#-#</td>
<td>Indicates the software version running on the card</td>
</tr>
<tr>
<td>Firmware Rev</td>
<td>#.#</td>
<td>Indicates the firmware version running on the card</td>
</tr>
<tr>
<td>CPLD Rev</td>
<td>#.#</td>
<td>Indicates the complex programmable logic device version of the GATOR-TOOLBOX</td>
</tr>
<tr>
<td>Daughter Card</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Hardware Tab

**Table 11** summarizes the read-only information displayed in the Hardware tab.

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Status</td>
<td>OK (Green)</td>
<td>Fans are operating correctly; no errors are detected</td>
</tr>
<tr>
<td>Alarm suppressed</td>
<td>(Green)</td>
<td>There are fan errors detected but the Global Alarm Enables &gt; Stalled Fan option is disabled (box is not selected)</td>
</tr>
<tr>
<td>Critical Temperature</td>
<td>(Red)</td>
<td>The FPGA temperature is 100°C (212°F) or above</td>
</tr>
<tr>
<td>Fan Off/Stalled</td>
<td>(Red)</td>
<td>The fan installed on the GATOR-TOOLBOX is not operating correctly</td>
</tr>
<tr>
<td>Voltage (mV)</td>
<td>#</td>
<td>Measured input millivolts</td>
</tr>
<tr>
<td>Current (mA)</td>
<td>#</td>
<td>Current consumption in milliamperes</td>
</tr>
<tr>
<td>Power (W)</td>
<td>#</td>
<td>Power consumption in watts</td>
</tr>
<tr>
<td>FPGA Temp (C)</td>
<td>#°C</td>
<td>Indicates the FPGA Core temperature where:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A green indicator displays when the temperature is less than 95°C.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A yellow indicator displays when the temperature is greater than or equal to 95°C.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A red indicator displays when the temperature is greater than or equal to 100°C (212°F).</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>If the temperature is greater than 100°C (212°F), the user must manually power down the card.</strong></td>
</tr>
<tr>
<td>AXI Bridge</td>
<td>#</td>
<td>The Advanced extensible interface bridge is running correctly on the GATOR-TOOLBOX. This information is for Ross Technical Support.</td>
</tr>
<tr>
<td>Fan Speed</td>
<td>#</td>
<td>Reports the speed (rpm) of the fan on the board</td>
</tr>
</tbody>
</table>
Table 11 Hardware Tab

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Usage</td>
<td>x.xx / y.yy / z.zz</td>
<td>Displays the CPU Load average where:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• x.xx represents in the last minute</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• y.yy represents the last five minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• z.zz represents the last fifteen minutes</td>
</tr>
<tr>
<td>RAM Available</td>
<td># / # MB</td>
<td>CPU Memory Used / Total CPU Memory</td>
</tr>
<tr>
<td>SD Card Status</td>
<td># of #GB used</td>
<td>Reports the amount of memory used on the Micro SD card</td>
</tr>
<tr>
<td>Daughter Board</td>
<td>#</td>
<td>Measured Daughter Board input millivolts</td>
</tr>
<tr>
<td>Voltage (mV)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daughter Board</td>
<td>#</td>
<td>Current consumption of the Daughter Board in milliamperes</td>
</tr>
<tr>
<td>Current (mA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daughter Board</td>
<td>#</td>
<td>Power consumption of the Daughter Board in watts</td>
</tr>
<tr>
<td>Power (W)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Licensing State Tab

Table 12 summarizes the read-only information displayed in the Licensing State tab.

Table 12 Licensing State Tab

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Product Type</td>
<td>GATOR-TOOLBOX</td>
<td></td>
</tr>
<tr>
<td>GATOR-TOOLBOX+UHD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>License State</td>
<td>Unlicensed</td>
<td>The license key for the feature is not installed. Navigate to the Configure License tab to enable this feature</td>
</tr>
<tr>
<td></td>
<td>Licensed</td>
<td>The license key for the GATOR-TOOLBOX+UHD feature was correctly enabled in the Configure License tab</td>
</tr>
<tr>
<td>GATOR-TOOLBOX+FRC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>License State</td>
<td>Unlicensed</td>
<td>The license key for the feature is not installed. Navigate to the Configure License tab to enable this feature</td>
</tr>
<tr>
<td></td>
<td>Licensed</td>
<td>The license key for the GATOR-TOOLBOX+FRC feature was correctly enabled in the Configure License tab</td>
</tr>
<tr>
<td>GATOR-TOOLBOX+HDR-LUT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>License State</td>
<td>Unlicensed</td>
<td>The license key for the feature is not installed. Navigate to the Configure License tab to enable this feature</td>
</tr>
<tr>
<td></td>
<td>Licensed</td>
<td>The license key for the GATOR-TOOLBOX+HDR-LUT feature was correctly enabled in the Configure License tab</td>
</tr>
</tbody>
</table>
Setup Tab

Table 13 summarizes the options displayed in the Setup tab.

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference Source</td>
<td>Frame 1</td>
<td>Uses the reference signal connected to the REF 1 BNC on the openGear frame</td>
</tr>
<tr>
<td></td>
<td>Frame 2</td>
<td>Uses the reference signal connected to the REF 2 BNC on the openGear frame</td>
</tr>
<tr>
<td></td>
<td>Local</td>
<td>Uses the reference signal connected to the REF IN port on the GATOR-TOOLBOX rear module</td>
</tr>
<tr>
<td>Input SDI</td>
<td></td>
<td>Uses the video signal connected to the SDI IN port on the rear module</td>
</tr>
<tr>
<td>Input Fiber</td>
<td></td>
<td>Uses the video signal connected to the specified SDI IN port of SFP 1. This option only displays when the GATOR-TOOLBOX is connected to the 8323AR-327 rear module. Refer to “R4F-GATOR Rear Module” for port designations.</td>
</tr>
</tbody>
</table>

IO Mapping

<table>
<thead>
<tr>
<th>Input Status</th>
<th>Gearbox input: enabled</th>
<th>The Gearbox feature of the GATOR-TOOLBOX is currently in use on the inputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel not in sync</td>
<td>Gearbox input: disabled</td>
<td>The Gearbox feature is not in use on any inputs</td>
</tr>
</tbody>
</table>

Input Mapping

<table>
<thead>
<tr>
<th>Input Mapping</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Link</td>
<td></td>
<td>The GATOR-TOOLBOX ingests one 12Gbps signal</td>
</tr>
<tr>
<td>Quad Link: 2SI</td>
<td></td>
<td>The GATOR-TOOLBOX ingests four 3Gbps Level A 2SI signals</td>
</tr>
<tr>
<td>Quad Link: SQD</td>
<td></td>
<td>The GATOR-TOOLBOX ingests four 3Gbps SQD signals</td>
</tr>
<tr>
<td>Fibera</td>
<td></td>
<td>The GATOR-TOOLBOX ingests one 12Gbps signal via the SDI IN connection of SFP 1 and outputs one 12Gbps via the SDI OUT connection of SFP 1. The Output Mapping is automatically set to Single Link and cannot be changed. Refer to “R4F-GATOR Rear Module” for port designations.</td>
</tr>
</tbody>
</table>

Output Status

<table>
<thead>
<tr>
<th>Output Status</th>
<th>Gearbox output: enabled</th>
<th>The Gearbox feature of the GATOR-TOOLBOX is currently in use on the outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gearbox output: disabled</td>
<td></td>
<td>The Gearbox feature is not in use on any outputs</td>
</tr>
</tbody>
</table>
Network Tab

Table 14 summarizes the menus and read-only fields displayed in the Network tab.

<table>
<thead>
<tr>
<th>Table 14 Network</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Item</strong></td>
</tr>
<tr>
<td>Network Time</td>
</tr>
<tr>
<td>Use Time from Network Controller Card</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Default Gateway</td>
</tr>
<tr>
<td>Current (read-only)</td>
</tr>
<tr>
<td>Static Gateway</td>
</tr>
<tr>
<td>openGear Chassis RJ-45</td>
</tr>
</tbody>
</table>
Table 14  Network

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Link Status (read-only)</td>
<td>OK (Green)</td>
<td>The GATOR-TOOLBOX is communicating on the network via the Network Controller Card</td>
</tr>
<tr>
<td>Invalid Subnet Mask (Yellow)</td>
<td></td>
<td>The Current Subnet Mask value is set incorrectly or is invalid within your network</td>
</tr>
<tr>
<td>Apply/Cancel Changes (Yellow)</td>
<td></td>
<td>One or more setting on this tab was changed but the Apply button was not selected</td>
</tr>
<tr>
<td>Link Down (Red)</td>
<td></td>
<td>The link for the Network Controller Card is invalid</td>
</tr>
<tr>
<td>Current IP Address (read-only)</td>
<td>#.#.#.#</td>
<td>Indicates the IP Address currently assigned to the GATOR-TOOLBOX via the Network Controller Card</td>
</tr>
<tr>
<td>Current Subnet Mask (read-only)</td>
<td>#.#.#.#</td>
<td>Indicates the subnet mask for the GATOR-TOOLBOX</td>
</tr>
<tr>
<td>MAC Address (read-only)</td>
<td>#</td>
<td>Indicates the MAC Address currently assigned to the GATOR-TOOLBOX</td>
</tr>
<tr>
<td>Mode</td>
<td>Static</td>
<td>The user manually supplies the network settings for the GATOR-TOOLBOX</td>
</tr>
<tr>
<td></td>
<td>DHCP*</td>
<td>Automates the assignment of network settings for the GATOR-TOOLBOX</td>
</tr>
<tr>
<td>Static IP Address</td>
<td>#</td>
<td>The IP Address for the GATOR-TOOLBOX that the user manually assigned</td>
</tr>
<tr>
<td>Subnet Mask</td>
<td>#</td>
<td>The Subnet Mask for the GATOR-TOOLBOX that the user manually assigned</td>
</tr>
</tbody>
</table>

Global Alarm Enables Tab

Table 15 summarizes the options displayed in the Global Alarm Enables tab.

Table 15  Global Alarm Enables Tab

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Alarm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network Time (read-only)</td>
<td>#</td>
<td>Displays the time data transmitted by the Frame Controller card in the same openGear frame. Requires that the Global &gt; Network &gt; Use time from Frame Controller box is selected.</td>
</tr>
<tr>
<td>Alarm Enable</td>
<td>Selected*</td>
<td>Reports when a loss of connection to the Frame Controller card occurs</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>Disables this alarm</td>
</tr>
<tr>
<td>Rear Module Alarm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 15 Global Alarm Enables Tab

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status (read-only)</td>
<td>OK (Green)</td>
<td>The rear module installed with the GATOR-TOOLBOX is a supported model</td>
</tr>
<tr>
<td>Alarm Suppressed (Green)</td>
<td></td>
<td>The Alarm Enable box is cleared. The status of the rear module will not be reported.</td>
</tr>
<tr>
<td>Incompat Rear Module (Red)</td>
<td></td>
<td>The rear module installed with the GATOR-TOOLBOX is not supported. Refer to “Supported Rear Modules” for a list of supported rear modules.</td>
</tr>
<tr>
<td>Alarm Enable</td>
<td>Selected*</td>
<td>The Global &gt; Product &gt; Rear Module Status field reports when a rear module is not compatible with the card</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>Disables this alarm</td>
</tr>
</tbody>
</table>

**Fan Alarm**

| Fan Speed (read-only)       | #                  | Reports the fan speed (rpm) of the fan on the board                          |
| Alarm Enable                | Selected*          | The GATOR-TOOLBOX reports when the fan is not working correctly              |
|                             | Cleared            | Disables this alarm                                                         |

**Analog Reference Alarm**

| Reference Format (read-only) | OK (Green)         | Indicates the detected reference format is supported                         |
| Alarm Suppressed (Green)    |                    | The Alarm Enable box is cleared. The status of the reference signal will not be reported. |
| Unlocked (Red)              |                    | A reference signal is detected, but the card is not locked to it             |
| Unsupported (Red)            |                    | A reference signal is detected, but the format is not supported by the GATOR-TOOLBOX |
| Incompatible (Red)          |                    | A reference signal is detected but the format is incompatible with the current output mode of the card |
| Alarm Enable                | Selected*          | The Global > Signal > Analog Reference Status field reports when there is a loss of reference signal |
|                             | Cleared            | Disables this alarm                                                         |

**SDI Input Alarms**

| Input # Status (read-only) |                    | This field duplicates the information reported in the Input Status field as outlined in Table 20. |
| Alarm Enable              | Selected*          | GATOR-TOOLBOX reports a loss of the specified input or if the format is incompatible for the specified input |
|                             | Cleared            | Disables this alarm                                                         |
Security Tab

Table 16 summarizes the options displayed in the Security tab.

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security Configuration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSH Login</td>
<td>Disable*</td>
<td>Disables the ability for a user to log onto the GATOR-TOOLBOX via a SSH client</td>
</tr>
<tr>
<td></td>
<td>Enable</td>
<td>The GATOR-TOOLBOX can be accessed via a secure channel by an SSH client. This should only be selected if directed to do so by Ross Video Technical Support.</td>
</tr>
</tbody>
</table>

Preset Tab

Table 17 summarizes the options in the Preset tab.

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selected Presets</td>
<td>&lt;text&gt;</td>
<td>Specifies which preset will be stored/edited/recalled to the GATOR-TOOLBOX</td>
</tr>
<tr>
<td>Preset Actions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rename</td>
<td>&lt;text&gt;</td>
<td>Applies a new label to the selected Preset button</td>
</tr>
<tr>
<td>Store</td>
<td></td>
<td>Captures the current configuration of the GATOR-TOOLBOX and saves it to the selected Preset button.</td>
</tr>
<tr>
<td>Recall</td>
<td></td>
<td>Applies the configuration of the selected Preset button to the GATOR-TOOLBOX</td>
</tr>
</tbody>
</table>

Configure Licenses Tab

Table 18 summarizes the read-only information displayed in the Configure Licenses tab.

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Product Type</td>
<td>GATOR-TOOLBOX</td>
<td></td>
</tr>
<tr>
<td>Feature</td>
<td>GATOR-TOOLBOX++#</td>
<td>Specifies the license(s) available for your card</td>
</tr>
<tr>
<td>Request Code</td>
<td>#</td>
<td>This character string is used to obtain a license key</td>
</tr>
<tr>
<td>Key</td>
<td>#</td>
<td>Specifies the license key that was provided for the specified feature</td>
</tr>
</tbody>
</table>
Logging Tab

Table 19 summarizes the menus and read-only fields displayed in the Logging tab.

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logging Level</td>
<td></td>
<td>Filters the events the System Log captures</td>
</tr>
<tr>
<td>Remote Logging</td>
<td>#.#.#.#</td>
<td>Specifies the IP Address for the external device that is logging the communication activity for the GATOR-TOOLBOX</td>
</tr>
<tr>
<td>System Log</td>
<td></td>
<td>Displays the events logged for the GATOR-TOOLBOX since the last time the log was cleared</td>
</tr>
</tbody>
</table>

GATOR-TOOLBOX Interfaces

Double-click the Gator Toolbox sub-node to display the configuration options for the channel in the right pane of the DashBoard window.

![Figure 29  Example of a GATOR-TOOLBOX Channel Interface in DashBoard](image)

GATOR-TOOLBOX Status Tab

Table 20 summarizes the read-only fields displayed in the Status tab for the channel.

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Input</td>
<td>#</td>
<td>Indicates the source for the active SDI input signal</td>
</tr>
<tr>
<td>Backup Input</td>
<td>#</td>
<td>Indicates the source for the backup SDI input signal</td>
</tr>
</tbody>
</table>
**Table 20  GATOR-TOOLBOX Interface — Status**

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Input</td>
<td>Primary Input Source</td>
<td>Indicates that the Primary Input Source is the active input signal for the card. The signal is assigned via the Config &gt; Primary Video Source menu.</td>
</tr>
<tr>
<td>Backup Input Source</td>
<td>Indicates that the Backup Input Source is the active input signal for the card. The signal is assigned via the Config &gt; Backup Video Source menu.</td>
<td></td>
</tr>
<tr>
<td>Status</td>
<td>OK (Green)</td>
<td>No errors are detected on the video signal of the specific SDI IN BNC</td>
</tr>
<tr>
<td>Alarm suppressed</td>
<td>(Green)</td>
<td>The GATOR-TOOLBOX is not monitoring the input signal(s)</td>
</tr>
<tr>
<td>Unsupported Format</td>
<td>(Yellow)</td>
<td>An input signal is detected on the specific SDI IN BNC but the video is not supported by the card</td>
</tr>
<tr>
<td>Incompatible Video</td>
<td>(Yellow)</td>
<td>An input signal is detected on the specific SDI IN BNC but its format is not compatible with the output video format</td>
</tr>
<tr>
<td>Not time to Ref</td>
<td>(Yellow)</td>
<td>An input signal is detected on the specific SDI IN BNC but the detected reference signal is incompatible with this input signal</td>
</tr>
<tr>
<td>Gearbox: Format not 3G</td>
<td>(Yellow)</td>
<td>An input signal is detected on the specific SDI IN BNC but it is a format other than 1080p 59.94Hz or 1080p 50Hz</td>
</tr>
<tr>
<td>Gearbox: Frame rate</td>
<td>mismatch (Yellow)</td>
<td>The frame rate on the specified input signal does not match the output frame rate</td>
</tr>
<tr>
<td>Gearbox: Timing</td>
<td>mismatch (Yellow)</td>
<td>The input signals for the Gearbox are not co-timed</td>
</tr>
<tr>
<td>No Signal</td>
<td>(Red)</td>
<td>Indicates one of the following issues is occurring:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• the SDI input signal is not detected</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• SDI IN 1 is not detected in Single Link mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• the system frame rate does not match the input frame rate</td>
</tr>
<tr>
<td>Format</td>
<td>#</td>
<td>Indicates the input video format</td>
</tr>
<tr>
<td>Invalid Selection</td>
<td>The input video format is not supported or does not match the reference format</td>
<td></td>
</tr>
<tr>
<td>Timing</td>
<td>Lines: #, Pixels: #</td>
<td>Indicates the timing offset between the video input signal and the reference signal. The unit of measure is lines and pixels with respect to the input video format.</td>
</tr>
</tbody>
</table>
Input Status Tab
The Input Status tab is organized into three sub-tabs: Video Status, Audio Status, and AES.

Video Status Tab
Table 21 summarizes the read-only fields displayed in the Video Status tab.

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input #</td>
<td>#a #x #s #s</td>
<td>Indicates the input audio status where:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• # represents the audio group (e.g. 1, 2, 3, 4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• a represents an async audio group</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• x represents a missing audio group</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• s represents a sync audio group</td>
</tr>
</tbody>
</table>

Output Status
Indicates the output status of the SDI OUT BNC:
- OK (Green): No errors detected on the video signal
- Alarm Suppressed (Green): The GATOR-TOOLBOX is not monitoring the output signal(s)
- Test Pattern: Color (Green): The current output is set to a test pattern
- Matte Pattern (Green): The current output is set to black
- No Lock (Red): A reference signal is detected, but the card output is not locked to it
- Frame Rate Conversion license required (Red): Requires a license key

Format
Indicates the output video format:
- Invalid Selection: The input video format is not supported or does not match the reference format

Timing
Indicates the timing offset between the video output signal and the reference signal:
- # lines (to x): Specifies the reference signal
### Alarm Enable

- **Selected**
  - An alarm is reported during a loss of the specified input or the format is incompatible for the specified input.
- **Cleared**
  - Disables the alarm.

### CRC Errors

- **#**
  - Displays the count of the CRC errors on the video input. This counter is reset on loss of video, or by user request. The counter is non-latching, and the count can roll over the counter.
- **Reset**
  - Resets the CRC Errors field.

### ST-352 Details

- **Status**
  - #
  - 352M is detected and the 4 bytes are displayed.

### Loss of Input Failover Status

- **Primary Input (read-only)**
  - **Input #**
  - Reports the SDI signal assigned as the primary SDI input. This is set in the Config tab.

- **Backup Input (read-only)**
  - **Input #**
  - Reports the SDI signal assigned as the backup SDI input. This is set in the Config tab.

- **Active Input (read-only)**
  - **Primary Input Source**
  - **Back Input Source**
  - Reports which SDI signal (Primary or Backup) is the currently active input signal.

### Input ANC

- **Status (read-only)**
  - **ANC: Present (Green)**
    - Expected incoming ANC data: present
  - **ANC: Exceeded Bandwidth**
    - Captured VANC services exceeded bandwidth
  - **ANC: Missing**
    - Expected incoming ANC data: not present
  - **ANC: Present in Luma and Chroma**
    - Incoming data was found on both LUMA and CHROMA channels
  - **ANC: Unexpected: Field #**
    - Receiving ANC data from wrong field
  - **ANC: Unexpected: LUMA**
    - Receiving ANC data from wrong channel
  - **ANC: Unexpected: CHROMA**
    - Receiving ANC data from wrong channel
  - **ANC: Line Out of Range**
    - Receiving data from wrong line
  - **ANC: Too Many Packets in Frame**
  - **ANC: Not Assigned**
    - The required output port has not been assigned
  - **ANC: Not Connected**
    - The output has been assigned, but is not connected
  - **ANC: Overflow**
    - Exceeded output bandwidth. Lost data.
Table 22 Input Status — Audio Status

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status (read-only)</td>
<td>ANC: CRC Error</td>
<td>CRC error found in incoming ANC data: some protocols only</td>
</tr>
<tr>
<td></td>
<td>ANC: Parse Error</td>
<td>Incoming data does not match expected protocol</td>
</tr>
<tr>
<td></td>
<td>ANC: Invalid Length</td>
<td>The length of incoming ANC packet is incorrect for service</td>
</tr>
<tr>
<td>Data Rate (Bytes/Sec)</td>
<td>#</td>
<td>Reports the upstream data transfer rate; the number of bytes received in the last field</td>
</tr>
<tr>
<td>Line</td>
<td># VL, VC</td>
<td>Reports the upstream data insertion location</td>
</tr>
<tr>
<td></td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Alarm Enable</td>
<td>Selected*</td>
<td>The GATOR-TOOLBOX monitors the Input ANC status and updates the Status field accordingly</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>Disables this alarm</td>
</tr>
<tr>
<td>Field #</td>
<td>Bandwidth Used (%)</td>
<td>The overall bandwidth percentile including buffer overflow state, of all incoming ANC services on the SDI input</td>
</tr>
</tbody>
</table>

Audio Status Tab

Table 22 summarizes the read-only fields displayed in the Audio Status tab.

Table 22 Input Status — Audio Status

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Embedded Audio Status - Group #</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ch # Status (read-only)</td>
<td>PCM</td>
<td>The channel is PCM audio</td>
</tr>
<tr>
<td></td>
<td>Non-PCM</td>
<td>The channel is non-PCM audio</td>
</tr>
<tr>
<td></td>
<td>Absent</td>
<td>The audio channel is not detected or invalid</td>
</tr>
<tr>
<td>Async Alarm</td>
<td>Selected*</td>
<td>An alarm is reported when the embedded audio is incompatible</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>Disables the alarm</td>
</tr>
<tr>
<td>Presence Alarm</td>
<td>Selected*</td>
<td>An alarm is reported when the embedded audio is not present</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>Disables the alarm</td>
</tr>
</tbody>
</table>

AES Status Tab

Table 23 summarizes the options, and read-only fields displayed in the AES Status tab.

* This tab only displays when using an R3A-GATOR (8322AR-319C) or R3B-GATOR (8322AR-318D) rear module.
Table 23 Input Status — AES Status

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AES # Input(^a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Rate Conversion</td>
<td>Selected</td>
<td>SRC is used on the input of the specified AES signal</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>SRC is not used on the input of the specified AES signal. Select this option when using non-PCM audio data.</td>
</tr>
<tr>
<td>Ch # Status (read-only)</td>
<td>PCM (Green)</td>
<td>Displays the status of the specified channel input</td>
</tr>
<tr>
<td></td>
<td>PCM-silent (Green)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non-PCM (Green)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No Input (Red)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Async(^b) (Red)</td>
<td></td>
</tr>
<tr>
<td>Word Length (read-only)</td>
<td>#bit</td>
<td>Reports the number of bits of audio</td>
</tr>
<tr>
<td>Sample Rate (read-only)</td>
<td>#kHz</td>
<td>Reports the sample rate of the AES input</td>
</tr>
<tr>
<td>Emphasis (read-only)</td>
<td>Yes</td>
<td>The incoming AES signal is indicating 50/15 or CCITT J.17 emphasis</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>The incoming AES signal is indicating no emphasis or the emphasis is not indicated</td>
</tr>
<tr>
<td>Presence Alarm(^c)</td>
<td>Selected(^*)</td>
<td>The Input Status &gt; AES Status tab reports when the specified AES input is not detected</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>Disables the alarm.</td>
</tr>
<tr>
<td>Async Alarm(^c)</td>
<td>Selected</td>
<td>The AES source is either asynchronous to the input video, or is not a 48kHz rate</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>Disables the alarm. The AES input is not monitored.</td>
</tr>
</tbody>
</table>

\(^a\) The fields on this tab are disabled if the AES signal is configured as an output.
\(^b\) If the Sample Rate Conversion is enabled, an Async AES signal is processed to be PCM and indicated as such.
\(^c\) This option is disabled if the AES signal is configured for loopback.

Config Tab

Table 24 summarizes the menus displayed in the Config tab.

Table 24 Config Tab

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Setup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Video Source</td>
<td>Input #</td>
<td>Specifies an SDI input for the Primary input signal when the Loss of Input Failover mode is enabled</td>
</tr>
</tbody>
</table>
### Table 24 Config Tab

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backup Video Source</td>
<td>Input #</td>
<td>Specifies the SDI input for the Backup input signal when the Loss of Input Failover mode is enabled</td>
</tr>
</tbody>
</table>

#### Configure Loss of Input

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Input (read-only)</td>
<td>Input #</td>
<td>Reports the SDI signal assigned as the Primary SDI input</td>
</tr>
<tr>
<td>Backup Input (read-only)</td>
<td>Input #</td>
<td>Reports the SDI signal assigned as the Backup SDI input</td>
</tr>
<tr>
<td>Active Input (read-only)</td>
<td>#</td>
<td>Reports which SDI signal (Primary or Backup) is the currently active input signal</td>
</tr>
<tr>
<td>Loss of Input Failover</td>
<td>ON</td>
<td>Enables the feature where one specified input video signal (as defined by the Primary Video Source menu) is the primary source and a second source is defined as the Backup Video Source (by default).</td>
</tr>
<tr>
<td></td>
<td>OFF*</td>
<td>Disables this feature</td>
</tr>
<tr>
<td>Force Failover</td>
<td>Normal*</td>
<td>The card automatically switches input video sources when a loss of input signal is detected</td>
</tr>
<tr>
<td></td>
<td>Forced</td>
<td>The user must manually switch between the input video sources by clicking this button</td>
</tr>
<tr>
<td>Auto Return</td>
<td>Yes</td>
<td>The card automatically switches back to the Primary source when it becomes available</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>The card stays on the Backup source until the user manually switches the signal back to the Primary source</td>
</tr>
<tr>
<td>Return to Primary</td>
<td>Click this button to immediately switch back to the Primary source</td>
<td></td>
</tr>
</tbody>
</table>

#### Output Setup

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Format</td>
<td>#</td>
<td>Selects the video format for the output signal. Note that a change in video format will not take effect until the reference is compatible</td>
</tr>
<tr>
<td>Output Video Source</td>
<td>Video in</td>
<td>Specifies that the input video signal will be the output</td>
</tr>
<tr>
<td></td>
<td>Test Pattern</td>
<td>Specifies that a SMPTE bars test pattern will replace all of the output picture (but not the HANC and VANC)</td>
</tr>
<tr>
<td>Horizontal Delay (percent of line)</td>
<td>#</td>
<td>Adjusts the horizontal delay with respect to the selected reference</td>
</tr>
<tr>
<td>Vertical Delay (lines)</td>
<td>#</td>
<td>Specifies the vertical delay with respect to the selected reference</td>
</tr>
</tbody>
</table>
Video Correction Tabs

The Video Correction options are organized into sub-tabs that provide options for color correction and conversion.

SDR/HDR Conversion Sub-tab

Table 25 summarizes the options displayed in the SDR/HDR Conversion sub-tab.

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bypass</td>
<td></td>
<td>The card is passing through the video input without modifications</td>
</tr>
<tr>
<td>Normal</td>
<td></td>
<td>The card is processing the video input through the ProcAmps, the SDR/HDR converter, and the RGB Color Corrector. and performing the target transform</td>
</tr>
<tr>
<td>SDI Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Color Gamut</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BT.709 SDR</td>
<td>HD color gamut, Standard Dynamic Range</td>
<td></td>
</tr>
<tr>
<td>BT.2020 SDR</td>
<td>UHD wide color gamut, Standard Dynamic Range</td>
<td></td>
</tr>
<tr>
<td>BT.2020 HLG</td>
<td>UHD wide color gamut, Hybrid Log-Gamma dynamic range</td>
<td></td>
</tr>
<tr>
<td>BT.2020 PQ</td>
<td>UHD wide color gamut, Perceptual Quantizer dynamic range</td>
<td></td>
</tr>
<tr>
<td>BT.2020 SLOG3</td>
<td>UHD wide color gamut, Sony ® S-Log3 dynamic range</td>
<td></td>
</tr>
<tr>
<td>Follow Upstream</td>
<td></td>
<td>Automatically extracts the dynamic range and colorimetry information from the SDI video input 352M payload identifier and adjusts the SDR/HDR conversion accordingly</td>
</tr>
<tr>
<td>Input Proc Amp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black Offset</td>
<td>%</td>
<td>Adjusts the Luma (Y) black offset of the SDI input streams</td>
</tr>
<tr>
<td>Gain</td>
<td>#</td>
<td>Adjusts the Luma and Chroma (Y/C) gain of the SDI input streams</td>
</tr>
<tr>
<td>SDI Output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Color Gamut</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BT.709 SDR</td>
<td>HD color gamut, Standard Dynamic Range</td>
<td></td>
</tr>
<tr>
<td>BT.2020 SDR</td>
<td>UHD wide color gamut, Standard Dynamic Range</td>
<td></td>
</tr>
<tr>
<td>BT.2020 HLG</td>
<td>UHD wide color gamut, Hybrid Log-Gamma dynamic range</td>
<td></td>
</tr>
<tr>
<td>BT.2020 PQ</td>
<td>UHD wide color gamut, Perceptual Quantizer dynamic range</td>
<td></td>
</tr>
<tr>
<td>BT.2020 SLOG3</td>
<td>UHD wide color gamut, Sony ® S-Log3 dynamic range</td>
<td></td>
</tr>
</tbody>
</table>
Output Color Gamut Follow Input

Automatically follows the dynamic range and colorimetry information as defined in the SDI Input area. In that case no SDR/HDR conversion is performed but the other video processing featured such as the ProcAmps and the RGB Color Correction are still available.

### Output Proc Amp

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Offset %</td>
<td>Adjusts the Luma (Y) black offset of the SDI output streams</td>
</tr>
<tr>
<td>Gain #dB</td>
<td>Adjusts the Luma and Chroma (Y/C) gain of the SDI output streams</td>
</tr>
</tbody>
</table>

**Conversion > Tone Mapping**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Light</td>
<td>Uses the EOTF of the SDI input dynamic range and color gamut to convert the SDI input electrical signal to the Display Light units. Uses the inverse EOTF of the SDI output dynamic range and color gamut to convert the Display Light units to the SDI output electrical signal.</td>
</tr>
<tr>
<td>Scene Light</td>
<td>Uses the inverse EOTF of the SDI input dynamic range and color gamut to convert the SDI input electrical signal to Scene Light units. Uses the EOTF of the SDI output dynamic range and color gamut to convert the Scene Light units to the SDI output electrical signal</td>
</tr>
<tr>
<td>Direct Mapping</td>
<td>Performs a straight conversion, without dynamic range compression or expansion, and without color gamut compression or expansion</td>
</tr>
</tbody>
</table>

**ITU-R BT.2446 Method A**

Tone mapping methods for HDR to SDR down-conversions and inverse tone mapping methods for SDR to HDR up-conversions. Refer to “ITU-R BT.2446 Methods A, B, C Tone Mapping and Inverse Tone Mapping” for details.

**Conversion > RGB Cube File**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status Cube File Not Used (Green)</td>
<td>The Select File menu is set to [None]</td>
</tr>
<tr>
<td>Valid file (Green)</td>
<td>The last cube file selected using the RGB Cube file menu is imported and valid</td>
</tr>
<tr>
<td>Invalid file (Red)</td>
<td>An error occurred importing the last selected cube file. Verify that the file is in a supported format (*.cube)</td>
</tr>
<tr>
<td>Scan Files</td>
<td>Reads and list all the files found in the root directory and in the sub-directories, listing all the pre-loaded BBC and NBCU cube files libraries and any custom cube files already loaded by the user</td>
</tr>
<tr>
<td>Select File [None]</td>
<td>An RGB cube file is not currently loaded to the card</td>
</tr>
<tr>
<td>&lt;filename.cube&gt;</td>
<td>Indicates the last cube file loaded to the card. Note that loading a RGB Cube File disables the DashBoard Tone Mapping options Display/Scene light and Direct/Tone Mapping Methods.</td>
</tr>
</tbody>
</table>

---

**Table 25 Video Correction — SDR/HDR Conversion**

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Color Gamut</td>
<td>Follow Input</td>
<td>Automatically follows the dynamic range and colorimetry information as defined in the SDI Input area. In that case no SDR/HDR conversion is performed but the other video processing featured such as the ProcAmps and the RGB Color Correction are still available.</td>
</tr>
</tbody>
</table>

---

**Output Proc Amp**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Offset %</td>
<td>Adjusts the Luma (Y) black offset of the SDI output streams</td>
</tr>
<tr>
<td>Gain #dB</td>
<td>Adjusts the Luma and Chroma (Y/C) gain of the SDI output streams</td>
</tr>
</tbody>
</table>

**Conversion > Tone Mapping**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Light</td>
<td>Uses the EOTF of the SDI input dynamic range and color gamut to convert the SDI input electrical signal to the Display Light units. Uses the inverse EOTF of the SDI output dynamic range and color gamut to convert the Display Light units to the SDI output electrical signal.</td>
</tr>
<tr>
<td>Scene Light</td>
<td>Uses the inverse EOTF of the SDI input dynamic range and color gamut to convert the SDI input electrical signal to Scene Light units. Uses the EOTF of the SDI output dynamic range and color gamut to convert the Scene Light units to the SDI output electrical signal</td>
</tr>
<tr>
<td>Direct Mapping</td>
<td>Performs a straight conversion, without dynamic range compression or expansion, and without color gamut compression or expansion</td>
</tr>
</tbody>
</table>

**ITU-R BT.2446 Method A**

Tone mapping methods for HDR to SDR down-conversions and inverse tone mapping methods for SDR to HDR up-conversions. Refer to “ITU-R BT.2446 Methods A, B, C Tone Mapping and Inverse Tone Mapping” for details.

**Conversion > RGB Cube File**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status Cube File Not Used (Green)</td>
<td>The Select File menu is set to [None]</td>
</tr>
<tr>
<td>Valid file (Green)</td>
<td>The last cube file selected using the RGB Cube file menu is imported and valid</td>
</tr>
<tr>
<td>Invalid file (Red)</td>
<td>An error occurred importing the last selected cube file. Verify that the file is in a supported format (*.cube)</td>
</tr>
<tr>
<td>Scan Files</td>
<td>Reads and list all the files found in the root directory and in the sub-directories, listing all the pre-loaded BBC and NBCU cube files libraries and any custom cube files already loaded by the user</td>
</tr>
<tr>
<td>Select File [None]</td>
<td>An RGB cube file is not currently loaded to the card</td>
</tr>
<tr>
<td>&lt;filename.cube&gt;</td>
<td>Indicates the last cube file loaded to the card. Note that loading a RGB Cube File disables the DashBoard Tone Mapping options Display/Scene light and Direct/Tone Mapping Methods.</td>
</tr>
</tbody>
</table>
## Color Correction Sub-tab

Table 26 summarizes the options displayed in the **Color Correction** sub-tab.

### Table 26 Video Correction — Color Correction

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RGB Color Correction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RGB</td>
<td></td>
<td>Enables you to adjust the Red, Blue, and Green color components simultaneously</td>
</tr>
<tr>
<td>R</td>
<td></td>
<td>Enables you to adjust the red color component independently of the other components</td>
</tr>
<tr>
<td>G</td>
<td></td>
<td>Enables you to adjust the green color component independently of the other components</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>Enables you to adjust the blue color component independently of the other components</td>
</tr>
<tr>
<td>Gamma In</td>
<td>#</td>
<td>Applies a gamma function to the RGB' stream</td>
</tr>
<tr>
<td>Offset</td>
<td>#</td>
<td>Adjusts the black offset of the RGB' stream</td>
</tr>
<tr>
<td>Gain</td>
<td>#</td>
<td>Adjusts the gain of the RGB' stream</td>
</tr>
<tr>
<td>Lift</td>
<td>#</td>
<td>Lifts the black level of the RGB' stream, while applying a gain to keep the peak white at the same level</td>
</tr>
<tr>
<td>Inv. Gamma Out</td>
<td>#</td>
<td>Applies an inverse gamma function to the RGB' stream</td>
</tr>
</tbody>
</table>

## Alarms Sub-tab

Table 26 summarizes the options displayed in the **Alarms** sub-tab.
The Audio tab options are dependent on the GATOR model you have installed. There are two possible sub-tabs: Embedded and AES.

### Embedded Sub-tab

*Table 28* summarizes the options displayed in the Embedded sub-tab.

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bypass Alarm</td>
<td>Selected</td>
<td>Reports when the Normal/Bypass button, located in the top right corner of the Video Correction interface, is toggled to Bypass.</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>The status of the Normal/Bypass button is ignored</td>
</tr>
<tr>
<td>Input Mismatch Alarm</td>
<td>Selected</td>
<td>Reports when the SDR/HDR dynamic range and the BT.709 / BT.2020 colorimetry information decoded in the SDI video input does not match the SDI Input menu setting</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>The state of the input color settings are ignored</td>
</tr>
<tr>
<td>Cube File Alarm</td>
<td>Selected</td>
<td>Reports when there is a problem loading the user specified 33x33x33 3D-LUT RGB Cube File</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>The status of the cube file is ignored</td>
</tr>
</tbody>
</table>

### Table 27 Video Correction — Alarms

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bypass Alarm</td>
<td>Selected</td>
<td>Reports when the Normal/Bypass button, located in the top right corner of the Video Correction interface, is toggled to Bypass.</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>The status of the Normal/Bypass button is ignored</td>
</tr>
<tr>
<td>Input Mismatch Alarm</td>
<td>Selected</td>
<td>Reports when the SDR/HDR dynamic range and the BT.709 / BT.2020 colorimetry information decoded in the SDI video input does not match the SDI Input menu setting</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>The state of the input color settings are ignored</td>
</tr>
<tr>
<td>Cube File Alarm</td>
<td>Selected</td>
<td>Reports when there is a problem loading the user specified 33x33x33 3D-LUT RGB Cube File</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>The status of the cube file is ignored</td>
</tr>
</tbody>
</table>

### Audio Tab

The Audio tab options are dependent on the GATOR model you have installed. There are two possible sub-tabs: Embedded and AES.

#### Embedded Sub-tab

*Table 28* summarizes the options displayed in the Embedded sub-tab.

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Rate Conversion</td>
<td>Selected</td>
<td>Applies the SRC on the audio channels in the video input before processed by the Frame Sync</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>SRC is not applied to any of the audio channels in the SDI input Select this option when using non-PCM audio data</td>
</tr>
<tr>
<td>Ch #</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audio Source</td>
<td>Group # Ch #</td>
<td>Specifies the input for the specified channel that is inserted into the embedded pair (if present)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>#kHz Tone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Embeds the selected test tone</td>
</tr>
<tr>
<td>Mute</td>
<td>Selected</td>
<td>Mutes the input source for the specified channel that is inserted into the embedded pair (if present)</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>The input source for the specified channel is not muted</td>
</tr>
</tbody>
</table>
Table 28  GATOR-TOOLBOX # Interface — Audio > Embedded Tab

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AES # - Channel #</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audio Source</td>
<td>SDI# Ch #</td>
<td>Assigns the input for the specified channel</td>
</tr>
<tr>
<td>Mute</td>
<td>Selected</td>
<td>Mutes the input source for the specified channel</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>The input source for the specified channel is not muted</td>
</tr>
<tr>
<td>Gain (dB)</td>
<td>#</td>
<td>• Adjusts the gain of the specified channel of audio</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Select 0 when using non-PCM audio</td>
</tr>
<tr>
<td>Gain Lock</td>
<td>Selected</td>
<td>Locks the Ch Gain slider for the specified channel pair</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>Unlocks the Ch Gain slider</td>
</tr>
<tr>
<td>Sum</td>
<td>Selected</td>
<td>Both channels will carry the average of the two input channels ((A+B)/2)</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>Disables this feature</td>
</tr>
<tr>
<td>Invert</td>
<td>Selected</td>
<td>Inverts the audio signal of the specified pair</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>• Audio signal of the specified pair is not inverted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use for non-PCM audio data</td>
</tr>
<tr>
<td>Total Delay (ms)</td>
<td>#</td>
<td>Reports the total delay applied to the specified channel</td>
</tr>
<tr>
<td>(read-only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delay Offset (ms)</td>
<td></td>
<td>Adjusts the delay of the specified channel</td>
</tr>
<tr>
<td>Delay Lock</td>
<td></td>
<td>Locks the Ch Delay slider for the specified channel pair</td>
</tr>
<tr>
<td>Reset</td>
<td></td>
<td>Resets all Audio Output settings for the applicable audio pair to the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>factory default values</td>
</tr>
</tbody>
</table>

AES Sub-tab

Table 28 summarizes the options displayed in the AES sub-tab.

* This tab only displays when using an GATOR-4A or GATOR-4B.

Table 29  GATOR-TOOLBOX # Interface — Audio > AES Tab

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AES # - Channel #</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audio Source</td>
<td>SDI# Ch #</td>
<td>Assigns the input for the specified channel</td>
</tr>
<tr>
<td>Mute</td>
<td>Selected</td>
<td>Mutes the input source for the specified channel</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>The input source for the specified channel is not muted</td>
</tr>
<tr>
<td>Gain (dB)</td>
<td>#</td>
<td>• Adjusts the gain of the specified channel of audio</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Select 0 when using non-PCM audio</td>
</tr>
<tr>
<td>Gain Lock</td>
<td>Selected</td>
<td>Locks the Ch Gain slider for the specified channel pair</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>Unlocks the Ch Gain slider</td>
</tr>
<tr>
<td>Sum</td>
<td>Selected</td>
<td>Both channels will carry the average of the two input channels ((A+B)/2)</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>Disables this feature</td>
</tr>
</tbody>
</table>
ANC Tab

Table 30 summarizes the ANC options available in DashBoard.

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invert</td>
<td>Selected</td>
<td>Inverts the audio signal of the specified AES pair</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>• Audio signal of the specified AES pair is not inverted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use for non-PCM audio data</td>
</tr>
<tr>
<td>Total Delay (ms)</td>
<td>#</td>
<td>Reports the total delay applied to the specified AES channel</td>
</tr>
<tr>
<td>(read-only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delay Offset (ms)</td>
<td>#</td>
<td>Adjusts the delay of the specified AES channel</td>
</tr>
<tr>
<td>Delay Lock</td>
<td></td>
<td>Locks the Ch Delay slider for the specified AES channel pair</td>
</tr>
<tr>
<td>Reset</td>
<td></td>
<td>Resets all settings for the applicable AES pair to the factory default values</td>
</tr>
</tbody>
</table>

**Table 30  ANC Tab**

ST 352 Packet Insertion

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST 352 Location</td>
<td>Off</td>
<td>Determines where to insert the SMPTE ST-352 packet in the output</td>
</tr>
<tr>
<td></td>
<td>Luma Only</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chroma Only</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Luma and Chroma</td>
<td></td>
</tr>
<tr>
<td>ANC Frame Delay</td>
<td>#</td>
<td>• The frame delay is always relative to the next output frame.</td>
</tr>
<tr>
<td>(read-only)</td>
<td></td>
<td>• The ANC frame sync may operate with different input and output frame rates.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The output is at a fixed rate as defined by the Output Video mode.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• When the output rate is lower than the input rate, then there is the potential for multiple inputs fields to be copied into the same output field.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• When the output rate is higher than the input rate, then there will be some output fields with no ANC data.</td>
</tr>
<tr>
<td>Packet Name</td>
<td>#</td>
<td>Indicates the ancillary data type</td>
</tr>
<tr>
<td>(read-only)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 30 ANC Tab

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action</td>
<td>Delete</td>
<td>Card deletes the packet from the output</td>
</tr>
<tr>
<td></td>
<td>Pass</td>
<td>• The card receives and re-inserts the specified packet type into the specified line without modifying the packet contents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• This option is only applicable to packets that the card is not currently able to process</td>
</tr>
<tr>
<td>Insertion Line</td>
<td>Follow upstream</td>
<td>Uses the line detected in the input signal as the specified line to insert the ANC packet</td>
</tr>
<tr>
<td></td>
<td>Switch Line + #</td>
<td>Selects a line to insert the specified ANC packet on. Note that if more than one packet is to be inserted in the same line, the packet with the lowest insertion order number will be inserted first.</td>
</tr>
<tr>
<td>Process</td>
<td></td>
<td>Card receives the Closed Captioning CC-708 packet, processes it, and inserts a new packet into the specific line</td>
</tr>
<tr>
<td>Insertion Order</td>
<td>#</td>
<td>Defines the hierarchy of the packets insertion. Note that the lower the number, the higher priority the packet is given.</td>
</tr>
</tbody>
</table>

Format Converter Tab

Table 31 summarizes the options displayed in the Format Converter tab.

Table 31 Format Converter Tab

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format Converter Setup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cadence Detection</td>
<td>Disable</td>
<td>Disables this feature</td>
</tr>
<tr>
<td>Enable*</td>
<td></td>
<td>Enables automatic 2:3 file cadence detection</td>
</tr>
<tr>
<td>Vertical</td>
<td>#</td>
<td>Adjusts the horizontal and vertical frequency response of the scaler as required to enhance the image</td>
</tr>
<tr>
<td>Horizontal</td>
<td>#</td>
<td></td>
</tr>
</tbody>
</table>

GPI/Tally Tab

Table 32 summarizes the options displayed in the GPI/Tally tab.

Table 32 GPI/Tally Tab

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPI/Tally #</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 32  GPI/Tally Tab

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
<td>None*</td>
<td>The specified GPIO port is not configured and the GPI has no effect. The Trigger/Tally Type setting is ignored.</td>
</tr>
<tr>
<td>Tally Failover Active</td>
<td></td>
<td>The GPIO port will trigger when the card enters the failover state. It reflects whether the card is in failover state, either by Force Failover or automatic failover.</td>
</tr>
<tr>
<td>General Output</td>
<td></td>
<td>is useful for troubleshooting external equipment that is sending GPI's to Toolbox. The user can see the state change without affecting the state of the card. Unlike the General Output, it doesn't need the Manual Override option to be enabled.</td>
</tr>
<tr>
<td>GPI Force Failover</td>
<td></td>
<td>The port will trigger/enable/disable the Force Failover option</td>
</tr>
<tr>
<td>General Input</td>
<td></td>
<td>When the card receives a trigger on the selected GPI input, it runs the events that have been assigned to the GPI input.</td>
</tr>
<tr>
<td>Trigger/Tally Type</td>
<td>Edge Falling*</td>
<td>The selected function is executed when the GPI input signal transitions from High to Low</td>
</tr>
<tr>
<td></td>
<td>Edge Rising</td>
<td>The selected function is executed when the GPI input signal transitions from Low to High</td>
</tr>
<tr>
<td></td>
<td>Level High</td>
<td>The selected function is executed when the GPI input signal is driven High</td>
</tr>
<tr>
<td></td>
<td>Level Low</td>
<td>The selected function is executed when the GPI input signal is driven Low</td>
</tr>
<tr>
<td>Current State (read-only)</td>
<td>#</td>
<td>Reports the state of the port (whether is an input or an output)</td>
</tr>
<tr>
<td>Output Pulse Width (frames)</td>
<td>#</td>
<td>Specifies the number of frames between the rising and falling edges of the output</td>
</tr>
<tr>
<td>Manual Override</td>
<td>Selected</td>
<td>The user will trigger a switch in states</td>
</tr>
<tr>
<td></td>
<td>Cleared</td>
<td>The port will trigger a switch in states</td>
</tr>
</tbody>
</table>
GPI/Tally Logging Level

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency</td>
<td></td>
<td>Events are listed in a hierarchical order based on the selected severity including:</td>
</tr>
<tr>
<td>Alert</td>
<td></td>
<td>• internal errors and unrecognized or invalid responses from the GPI/Tally port</td>
</tr>
<tr>
<td>Critical</td>
<td></td>
<td>• failed communications between the GATOR-TOOLBOX (such as time outs) and the device connected to the GPI/Tally port.</td>
</tr>
<tr>
<td>Error</td>
<td></td>
<td>This is intended for troubleshooting incompatibilities between the GATOR-TOOLBOX and downstream devices.</td>
</tr>
<tr>
<td>Warning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Info*</td>
<td></td>
<td>The GATOR-TOOLBOX provides a summary of commands sent to and responses via this GPI/Tally port</td>
</tr>
</tbody>
</table>
Technical Specifications

This chapter provides technical information for GATOR-TOOLBOX.

* Specifications are subject to change without notice.

Supported Video Formats

Table 33  Technical Specifications — Supported Video Formats

<table>
<thead>
<tr>
<th>Resolution (lines)</th>
<th>Frame Rate (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>720p</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>59.94</td>
</tr>
<tr>
<td></td>
<td>60</td>
</tr>
<tr>
<td>1080i</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>59.94</td>
</tr>
<tr>
<td></td>
<td>60</td>
</tr>
<tr>
<td>1080p</td>
<td>23.98</td>
</tr>
<tr>
<td></td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>29.97</td>
</tr>
<tr>
<td></td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>59.94</td>
</tr>
<tr>
<td></td>
<td>60</td>
</tr>
<tr>
<td>1080pSF</td>
<td>23.98</td>
</tr>
<tr>
<td></td>
<td>24</td>
</tr>
<tr>
<td>2160p</td>
<td>23.98</td>
</tr>
<tr>
<td></td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>29.97</td>
</tr>
<tr>
<td></td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>59.94</td>
</tr>
<tr>
<td></td>
<td>60</td>
</tr>
</tbody>
</table>
### SDI Inputs Specifications

**Table 34 Technical Specifications — SDI Inputs**

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Inputs (based on rear module)</td>
<td>8322AR-318D 4</td>
</tr>
<tr>
<td></td>
<td>8322AR-319C 4</td>
</tr>
<tr>
<td></td>
<td>8323AR-325 4</td>
</tr>
<tr>
<td></td>
<td>8323AR-327(^a) 2 dedicated 2 bi-directional</td>
</tr>
<tr>
<td>Standards Accommodated</td>
<td>1.485Gbps SDI, SMPTE 292M</td>
</tr>
<tr>
<td></td>
<td>2.97Gbps SDI, SMPTE 424M</td>
</tr>
<tr>
<td></td>
<td>11.88Gbps SDI, SMPTE 2082</td>
</tr>
<tr>
<td>Impedance</td>
<td>75ohm</td>
</tr>
<tr>
<td>Return Loss</td>
<td>&gt;15dB to 1.485Gbps</td>
</tr>
<tr>
<td></td>
<td>&gt;10dB to 2.97Gbps</td>
</tr>
<tr>
<td></td>
<td>&gt;4dB to 11.88Gbps</td>
</tr>
<tr>
<td>Equalization (Belden 1694A cable)</td>
<td>&gt;220m (722ft) @ 1.485Gbps</td>
</tr>
<tr>
<td></td>
<td>&gt;140m (459ft) @ 2.97Gbps</td>
</tr>
<tr>
<td></td>
<td>&gt;50m (190ft) @ 11.88Gbps</td>
</tr>
<tr>
<td>Connector Type</td>
<td>8322AR-318D HD-BNC</td>
</tr>
<tr>
<td></td>
<td>8322AR-319C HD-BNC</td>
</tr>
<tr>
<td></td>
<td>8323AR-325 HD-BNC</td>
</tr>
<tr>
<td></td>
<td>8323AR-327 HD-BNC and SFP</td>
</tr>
</tbody>
</table>

\(^a\)Refer to “Supported SFP Modules” for more specifications.

### SDI Outputs Specifications

**Table 35 Technical Specifications — SDI Outputs**

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Outputs (based on rear module)</td>
<td>8322AR-318D 4</td>
</tr>
<tr>
<td></td>
<td>8322AR-319C 4</td>
</tr>
<tr>
<td></td>
<td>8323AR-325 4</td>
</tr>
<tr>
<td></td>
<td>8323AR-327(^a) 2 dedicated 3 bi-directional</td>
</tr>
<tr>
<td>Impedance</td>
<td>75ohm</td>
</tr>
<tr>
<td>Return Loss</td>
<td>&gt;15dB to 1.485Gbps</td>
</tr>
<tr>
<td></td>
<td>&gt;10dB to 2.97Gbps</td>
</tr>
<tr>
<td></td>
<td>&gt;4dB to 11.88Gbps</td>
</tr>
<tr>
<td>Signal Level</td>
<td>800mV ±10%</td>
</tr>
<tr>
<td>DC Offset</td>
<td>0V ±50mV</td>
</tr>
</tbody>
</table>
Table 35 Technical Specifications — SDI Outputs

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rise and Fall Time (20-80%)</td>
<td>1.485Gbps: &lt;270ps, &lt;100ps difference</td>
</tr>
<tr>
<td></td>
<td>2.97Gbps: &lt;135ps, &lt;50ps difference</td>
</tr>
<tr>
<td></td>
<td>11.88Gbps: &lt;45ps, &lt;18ps difference</td>
</tr>
<tr>
<td>Jitter</td>
<td>1.485Gbps: &lt;1.0UI jitter measured</td>
</tr>
<tr>
<td></td>
<td>10Hz-100kHz, &lt;0.2UI above 100kHz</td>
</tr>
<tr>
<td></td>
<td>2.97Gbps: &lt;1.0UI jitter measured</td>
</tr>
<tr>
<td></td>
<td>10Hz-100kHz, &lt;0.3UI above 100kHz</td>
</tr>
<tr>
<td></td>
<td>11.88Gbps: &lt;2.0UI jitter measured</td>
</tr>
<tr>
<td></td>
<td>10Hz-100kHz, &lt;0.3UI above 100kHz, band limit @1188MHz</td>
</tr>
<tr>
<td>Overshoot</td>
<td>&lt;10% (11.88Gpbs: &lt;15%)</td>
</tr>
<tr>
<td>Connector Type</td>
<td>8322AR-318D HD-BNC</td>
</tr>
<tr>
<td></td>
<td>8322AR-319C HD-BNC</td>
</tr>
<tr>
<td></td>
<td>8323AR-325 HD-BNC</td>
</tr>
<tr>
<td></td>
<td>8323AR-327 HD-BNC and SFP</td>
</tr>
</tbody>
</table>

a. Refer to “Supported SFP Modules” for more specifications.

AES Specifications

GATOR-4A

Table 36 Technical Specifications — GATOR-4A

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>AES Standards Accommodated</td>
<td>AES-3id-2001, AES3</td>
</tr>
<tr>
<td>Connector Type</td>
<td>HD-BNC</td>
</tr>
<tr>
<td>Inputs</td>
<td></td>
</tr>
<tr>
<td>Impedance</td>
<td>75ohm</td>
</tr>
<tr>
<td>Minimum Input</td>
<td>50mV p-p</td>
</tr>
<tr>
<td>Maximum Input</td>
<td>2.5V p-p @ 48kHz</td>
</tr>
<tr>
<td></td>
<td>1.5V p-p @ 96kHz</td>
</tr>
<tr>
<td>Minimum Audio Delay</td>
<td>SRC ON: 2ms</td>
</tr>
<tr>
<td></td>
<td>SRC OFF: 1ms</td>
</tr>
<tr>
<td>Maximum Audio Delay</td>
<td>1365 ms</td>
</tr>
<tr>
<td>Sampling Rate</td>
<td>48kHz compliant with AES-3id or any rate from 32kHz to 96kHz with SRC on</td>
</tr>
<tr>
<td>Equalization</td>
<td>up to 800m (2,400ft) @ 48kHz</td>
</tr>
<tr>
<td></td>
<td>up to 500m (1,500ft) @ 96kHz</td>
</tr>
</tbody>
</table>
### Table 36 Technical Specifications — GATOR-4A

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>AES Standards Accommodated</td>
<td>AES-3id-2001, AES3</td>
</tr>
<tr>
<td>Connector Type</td>
<td>WECO</td>
</tr>
<tr>
<td>Impedance</td>
<td>110ohm</td>
</tr>
<tr>
<td>Minimum Input</td>
<td>100mV p-p</td>
</tr>
<tr>
<td>Maximum Input</td>
<td>10V p-p</td>
</tr>
<tr>
<td>Minimum Audio Delay</td>
<td>SRC ON: 2ms</td>
</tr>
<tr>
<td></td>
<td>SRC OFF: 1ms</td>
</tr>
<tr>
<td>Maximum Audio Delay</td>
<td>1365 ms</td>
</tr>
<tr>
<td>Sampling Rate</td>
<td>48kHz compliant with AES-3id or any rate from 32kHz to 96kHz with SRC on</td>
</tr>
<tr>
<td>Equalization</td>
<td>&gt;450m of Belden 1492 cable</td>
</tr>
<tr>
<td>Return Loss</td>
<td>&gt;26dB 100KHz to 6MHz</td>
</tr>
<tr>
<td>Output Amplitude</td>
<td>4Vp-p</td>
</tr>
<tr>
<td>Rise and Fall Times</td>
<td>30ns</td>
</tr>
<tr>
<td>Jitter</td>
<td>4.5mUI</td>
</tr>
</tbody>
</table>

### Table 37 Technical Specifications — GATOR-4B

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impedance</td>
<td>75ohm</td>
</tr>
<tr>
<td>Output Level</td>
<td>1V p-p</td>
</tr>
<tr>
<td>Sampling Rate</td>
<td>48kHz</td>
</tr>
</tbody>
</table>
**GPIO**

*Table 38 Technical Specifications — GPIO*

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute Maximum Voltage at Connector Pins</td>
<td>1.0V to +6.0V to prevent damage</td>
</tr>
<tr>
<td><strong>GPI</strong></td>
<td></td>
</tr>
<tr>
<td>Input</td>
<td>• 4.7K ohm resistor pull-up to 5V for High</td>
</tr>
<tr>
<td></td>
<td>• GND contact closure (or external logic) for Low</td>
</tr>
<tr>
<td></td>
<td>• High In is &gt;= 2.5V</td>
</tr>
<tr>
<td></td>
<td>• Low In is &lt;= 0.5V</td>
</tr>
<tr>
<td><strong>Tally</strong></td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>• Pulled to 5V with 4k7 ohm resistor for High</td>
</tr>
<tr>
<td></td>
<td>• Driven to ground or Low through 30ohms</td>
</tr>
<tr>
<td></td>
<td>• Maximum sink current 50mA to drive an external relay</td>
</tr>
<tr>
<td></td>
<td>• To drive a logic gate input, sink current needs to be below 10mA (0.3V at pin)</td>
</tr>
</tbody>
</table>

**Environment**

*Table 39 Technical Specifications — Environment*

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Ambient Temperature</td>
<td>40°C (104°F)</td>
</tr>
</tbody>
</table>

**Power**

*Table 40 Technical Specifications — Power*

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Power Consumption</td>
<td>40W-80W (application dependent)</td>
</tr>
</tbody>
</table>
Supported SFP Modules

This chapter summarizes the supported SFP modules when using the GATOR-2F with the R4F-GATOR rear module.

SFP-FIBER-12G

The SFP-FIBER-12G is an optical transceiver module that supports data rates up to 12Gbps for single fiber communications.

Features

• SMPTE 297-2006 compatible for SD-SDI, HD-SDI, 3G-SDI, and 12G-SDI
• Compliant with SFP MSA (Small Form-Factor Pluggable Transceiver Multi-Source Agreement) and SFS-8472
• Compliant with SMPTE 297, SMPTE 259, SMPTE 292, SMPTE 424, SMPTE 2081, and SMPTE 2082
• 1310 DFB laser diode with CML logic interface
• Duplex LC receptacle
• Up to 10km on 9/125μm SMF
• Single 3.3V power supply
• Operating temperature range: 0°C to 70°C
• SFP package size: 56.5mm x 13.4mm x 8.6mm

Simplified Block Diagram

![Simplified Block Diagram of SFP-FIBER-12G](image)

Technical Specifications

Note that specifications are subject to change without notice.

Absolute Maximum Ratings

Exceeding any of these ratings may permanently damage the module. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>0V</td>
<td>+3.6V</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°C</td>
<td>+85°C</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>5%</td>
<td>95%</td>
</tr>
</tbody>
</table>
Recommended Operating Environment and Electrical Ratings

**Table 42 Recommended Ratings**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min.</th>
<th>Typical</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>+3.2V</td>
<td>+3.3V</td>
<td>+3.4V</td>
</tr>
<tr>
<td>Supply Current</td>
<td>-</td>
<td>-</td>
<td>300mA</td>
</tr>
<tr>
<td>Operating Case Temperature</td>
<td>0°C</td>
<td></td>
<td>+70°C</td>
</tr>
<tr>
<td>Data Rate</td>
<td>-</td>
<td>11.88Gbps</td>
<td>-</td>
</tr>
</tbody>
</table>

Optical Specifications

**Table 43 Optical Specifications — Transmitter**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min.</th>
<th>Typical</th>
<th>Max.</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient Operating Temperature</td>
<td>Ta=+25±5°C, VCC = 3.3±0.2V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Rate</td>
<td></td>
<td>11.88Gbps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Center Wavelength</td>
<td>1260nm</td>
<td>1310nm</td>
<td>1360nm</td>
<td></td>
</tr>
<tr>
<td>Output Spectral Width (-20dB)</td>
<td></td>
<td>1nm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Optical Output Power</td>
<td>-6dBm</td>
<td>0dBm</td>
<td></td>
<td>The optical power is launched into 9/125µm SMF</td>
</tr>
<tr>
<td>Extinction Ratio</td>
<td>3.5dB</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 44 Optical Specifications — Receiver**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min.</th>
<th>Typical</th>
<th>Max.</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiver Sensitivity</td>
<td>-11dBm</td>
<td></td>
<td></td>
<td>With a PRBS 223-1 test pattern @ 11.88Gbps</td>
</tr>
<tr>
<td>Maximum Input Power</td>
<td>-3dBm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation Center Wavelength</td>
<td>1260nm</td>
<td>1360nm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss of Signal</td>
<td>Assert</td>
<td>-25dBm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>De-assert</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOS Hysteresis</td>
<td>0.5dB</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Physical Channel Position

*Figure 31 SFP Package Outline, Front View — Channel Position*
Service Information

Routine maintenance to this product is not required. In the event of problems with your card, the following basic troubleshooting checklist may help identify the source of the problem. If the frame still does not appear to be working properly after checking all possible causes, please contact your openGear products distributor, or the Technical Support department at the numbers listed under the “Contacting Technical Support”.

1. **Visual Review** — Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the card, the frame, and any associated peripheral equipment for signs of trouble.

2. **Power Check** — Inspect the power indicator LED on the distribution frame front panel for the presence of power. If the power LED is not illuminated, verify that the power cable is connected to a power source and that power is available at the power main. Confirm that the power supplies are fully seated in their slots. If the power LED is still not illuminated, replace the power supply with one that is verified to work.

3. **Input Signal Status** — Verify that source equipment is operating correctly and that a valid signal is being supplied.

4. **Output Signal Path** — Verify that destination equipment is operating correctly and receiving a valid signal.

5. **Unit Exchange** — Exchanging a suspect unit with a unit that is known to be working correctly is an efficient method for localizing problems to individual units.

### Reloading the Software on the Card

In the unlikely event of a complete card failure, you may be instructed by a Ross Technical Support specialist to perform a complete software reload on the card.

**To reload the software on the card**

1. Eject the card from the frame.
2. Press and hold the **Bootload** button, while re-inserting the card into the frame.
3. Release the button.
   - If a new software load is not sent to the card within 60 seconds, the card will attempt to re-start with its last operational software load.
   - Software loads can be sent to the card via the connection on the rear of the frame.

### Warranty and Repair Policy

The GATOR-TOOLBOX is warranted to be free of any defect with respect to performance, quality, reliability, and workmanship for a period of FIVE (5) years from the date of shipment from our factory. In the event that your card proves to be defective in any way during this warranty period, Ross Video Limited reserves the right to repair or replace this piece of equipment with a unit of equal or superior performance characteristics.

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In Case of Problems

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zlib

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The data format used by the zlib library is described by RFCs (Request for Comments) 1950 to 1952 in the files ftp://ds.internic.net/rfc/rfc1950.txt (zlib format), rfc1951.txt (deflate format) and rfc1952.txt (gzip format).
Glossary

The following terms are used throughout this guide:

**Active image** — the portion of the video picture area (production aperture) that is being utilized for output content. Active image excludes letterbox bars and pillarbox bars.

**Card** — openGear terminal devices within openGear frames, including all components and switches.

**CBR** — constant bit rate

**DashBoard** — the DashBoard Control System

**DTVCC captions** — CEA-708 captions

**EETF** — Electrical Y’CbCr to Electrical Y’CbCr Transfer Function

**EOTF** — Electrical Y’CbCr to Optical display light Cd/m² Transfer Function

**Frame** — the openGear frame that houses the GATOR-TOOLBOX.

**HTTP** — Direct Hypertext Transfer Protocol

**MIB** — management information base

**Network Controller Card** — the MFC-OG3-N and any available options unless otherwise noted.

**NTSC captions** — the CEA-608-D: Line 21 Data Services captions.

**OETF** — Optical scene light Cd/m² to Electrical Y’CbCr Transfer Function

**OOTF** — Optical Cd/m² to Optical Cd/m² Transfer Function

**openGear frame** — refers to the OGX-FR series frames unless otherwise noted.

**PAL** — PAL-B and PAL-G unless otherwise stated.

**Production aperture** — the image lattice that represents the maximum possible image extent in a given standard (e.g. the full size of all active pixels and active lines). For example, the 1080i production aperture would be 1920x1080.

**System** — the mix of interconnected production and terminal equipment in your environment.

**TCP** — Transmission Control Protocol.

**User** — the person who uses the GATOR-TOOLBOX.