



GATOR-SYNC User Guide

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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.)*

GATOR-SYNC · User Guide

- Ross Part Number: **8922DR-004-03**
- Release Date: November 11, 2021.
- Software Version: 1.2

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Patents

Patent numbers US 7,034,886; US 7,508,455; US 7,602,446; US 7,802,802 B2; US 7,834,886; US 7,914,332; US 8,307,284; US 8,407,374 B2; US 8,499,019 B2; US 8,519,949 B2; US 8,743,292 B2; GB 2,419,119 B; GB 2,447,380 B; and other patents pending.

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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.

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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.*

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Cet appareil numerique de la classe "A" est conforme a la norme NMB-003 du Canada.

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Type of Equipment	User's Guide
A급 기기 (업무용 방송통신기자재)	이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.
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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.

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Introduction

This guide covers the installation, configuration, and use of the GATOR-SYNC 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 GATOR-SYNC.
- **“Hardware Overview”** provides a basic introduction to the GATOR-SYNC hardware features including the cabling and monitoring features of the rear module.
- **“Physical Installation”** provides instructions for the physical installation of the GATOR-SYNC 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-SYNC.
- **“Getting Started”** provides instructions for configuring the GATOR-SYNC network settings and outlines how to display the GATOR-SYNC interfaces in DashBoard.
- **“Reference Setup”** provides instructions for specifying the reference source for the GATOR-SYNC.
- **“Frame Sync Setup”** provides instructions for configuring the video settings of each frame sync.
- **“Upgrading the Software”** outlines how to upgrade the GATOR-SYNC via DashBoard.
- **“DashBoard Interface Overview”** summarizes the menus and parameters of the GATOR-SYNC tabs in DashBoard.
- **“Technical Specifications”** provides the specifications for the GATOR-SYNC.
- **“Service Information”** provides information on the warranty and repair policy for your GATOR-SYNC.
- **“Software Licenses”** provides third-party software license information for your GATOR-SYNC.
- **“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-SYNC:

- ***DashBoard User Manual***, Ross Part Number: 8351DR-004
- ***MFC-OG3-N User Manual***, Ross Part Number: 8322DR-004
- ***OG3-FR Series User Manual***, Ross Part Number: 8322DR-005
- ***OGX-FR Series User Manual***, 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 pertaining to the operation of GATOR-SYNC, contact us at the numbers listed in the section “**Contacting Technical Support**”. Our technical staff is always available for consultation, training, or service.

Video Overview

Each card provides a valid video output frame with formatted TRS codes. In certain conditions, however, the video output of the card will have to be re-synchronized and while doing so, the card will not be able to maintain a valid output. The following conditions will force a re-sync of the video output of the card:

- **Reference loss and reference re-acquired** — To provide a stable output, the card must have a stable reference.
- **Changes in the vertical (V) or horizontal (H) delay parameters** — A parameter change will force the GATOR-SYNC output to reset and restart the video output with the specified V/H offset. Note that changing the number of frames (F) of delay will not reset the output as long as the V/H parameters are constant.
- **Video input format change** — Depending on how the Loss of Input Format setting is configured, the card will auto-detect the video input format and apply the last valid input format (Last Input Format setting) or a specified format, it will set its output to match it. While doing so, the output will be reset to the format and re-started.

It is important to understand that when the card is using the digital reference extracted from the SDI video input, the SDI video input signal must be stable at all times. Any glitches on this signal will likely cause the card video output to stop and restart, basically re-syncing the video output to the digital reference. Therefore, in practical applications, it will not be possible to switch the SDI video input from an upstream router without re-syncing the card video output. For this reason, it is strongly recommended not to use the SDI input as the reference, and to select instead one of the analog references. If the SDI video input signal happens to be locked to the selected analog reference, the card will be effectively operating in frame delay mode, as no frames drop/repeat will be occurring.

Audio Overview

The audio timing for embedded audio of the GATOR-SYNC is within 1 frame of the video timing on the output (approximately 16ms in SD formats), as measured with an asynchronous video input and with no additional audio delay being added through card user controls. If the input video is locked to the same reference as the card, and is not asynchronous, the audio delay will match the video delay.

Features

Some features of the GATOR-SYNC include:

- Supports SMPTE 259M (270Mbps), SMPTE 292M (1.485Gbps), SMPTE 424M (2.987Gbps), SMPTE ST 2082 (11.88Gbps)
- Supports embedding of non-PCM data such as Dolby® Digital and Dolby® E
- Each frame sync is completely rate agile, accept different input formats all at once
- Can synchronize multiple formats at once assuming the same frame rate
- Support for multiple frames of video delay

- Support for different reference format locking (frame rates must match)
- Programmable video output on SDI input loss
- Automatic input video format detection
- Ability to strip VANC data from a video output
- Audio embedding for all popular formats: 720p, 1080i, 1080p (Level A), and 2160p
- Full control over channel assignments
- Audio controls such as gain, invert, delay, and sum on embedded outputs
- Internally generated test tones
- Automatic audio delay to match video delay in addition to up to 1 second of user adjusted audio delay
- Reports status and configuration remotely via the DashBoard Control System
- SNMP support available
- Fully compliant with openGear specifications
- 5-year transferable warranty

Functional Block Diagram

Figure 1 provides a general overview of the GATOR-SYNC functions.

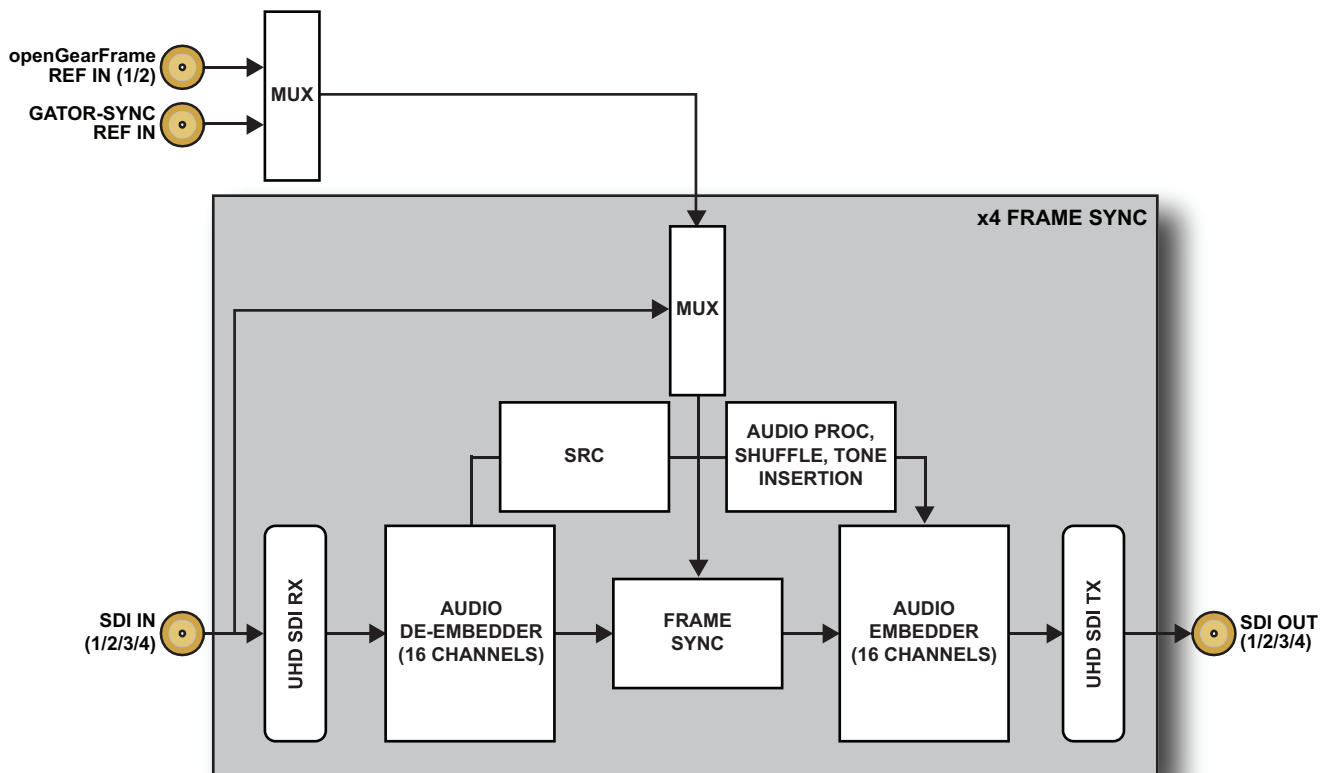


Figure 1 Functional Block Diagram

Hardware Overview

This chapter presents information on the GATOR-SYNC card-edge controls and features.

Overview

The GATOR-SYNC is an openGear modular system composed of two sub-systems.

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

Main PCB Overview

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

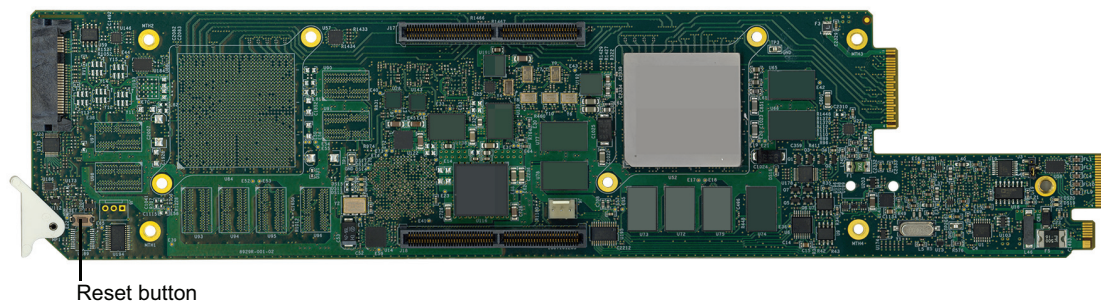


Figure 2 GATOR-SYNC — Base Card Components

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.

Back Components

The main PCB also includes a Micro SD card slot. This slot is located on the backside of the main PCB and just above the ejector. (**Figure 3**)

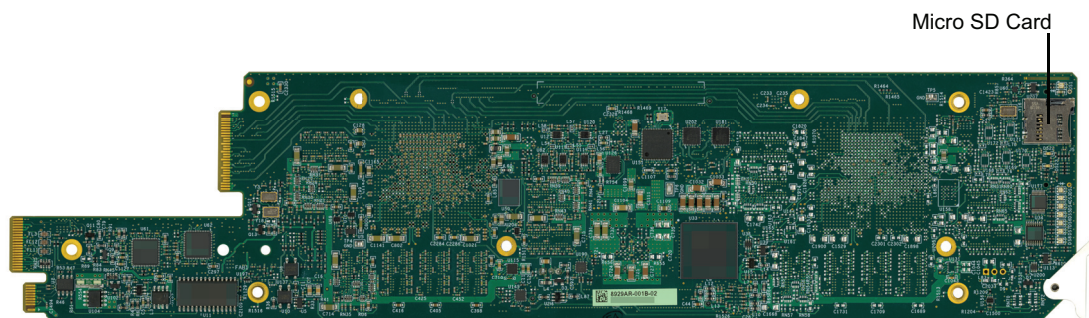


Figure 3 GATOR-SYNC — SD Card Location

- ★ It is recommended to ensure the SD card is properly seated in its slot on the PCB before installing the GATOR-SYNC in the frame.

GATOR-SYNC Rear Module Overview

This section provides an overview of the connections and cabling designations for the GATOR-SYNC.



Notice — Installing the GATOR-SYNC in a frame other than the OG3-FR or OGX-FR could damage the card, the rear module, or both.

8322AR-317 Rear Module

The GATOR-SYNC requires the 8322AR-317 rear module. The following connections are available:

- 4 SDI inputs on HD-BNCs
- 4 SDI outputs on HD-BNCs
- 1 independent reference input signal (tri-level sync)

Each rear module occupies four slots in the openGear frame and accommodates one GATOR-SYNC card. **Figure 4** indicates the implemented cabling designations.

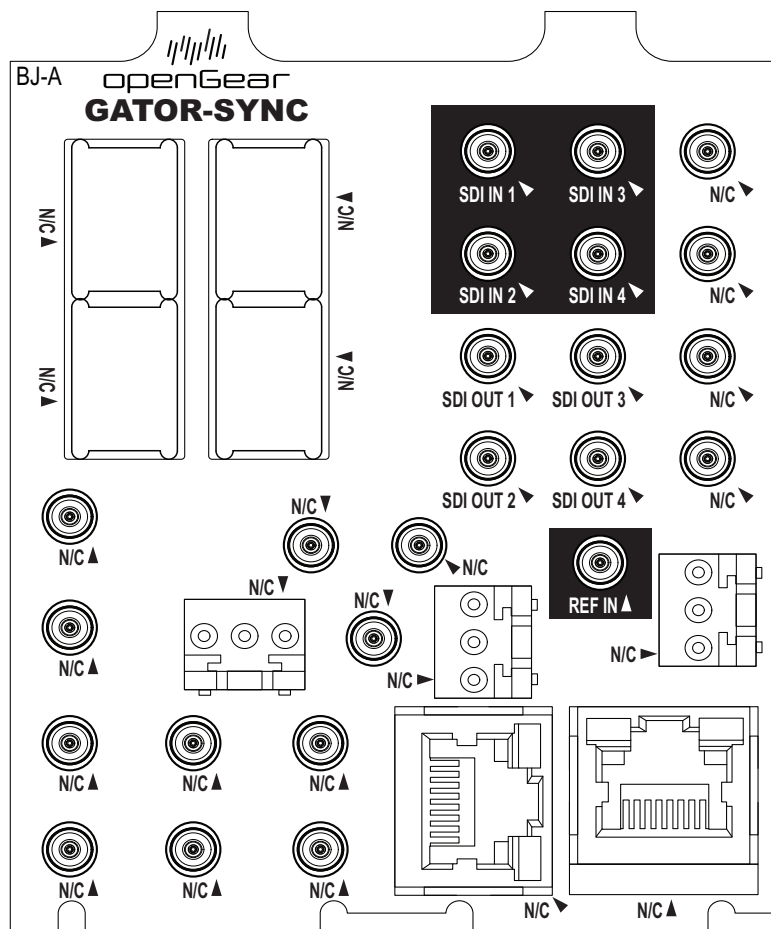


Figure 4 Cabling Designations — 8322AR-317

8323AR-325 Rear Module

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

The following connections are available when the GATOR-SYNC is installed with the 8323AR-325 rear module:

- 4 SDI inputs on HD-BNCs
- 4 SDI outputs on HD-BNCs
- 1 independent reference input signal

Each rear module occupies two slots in the openGear frame and accommodates one GATOR-SYNC card. **Figure 5** indicates the implemented cabling designations.

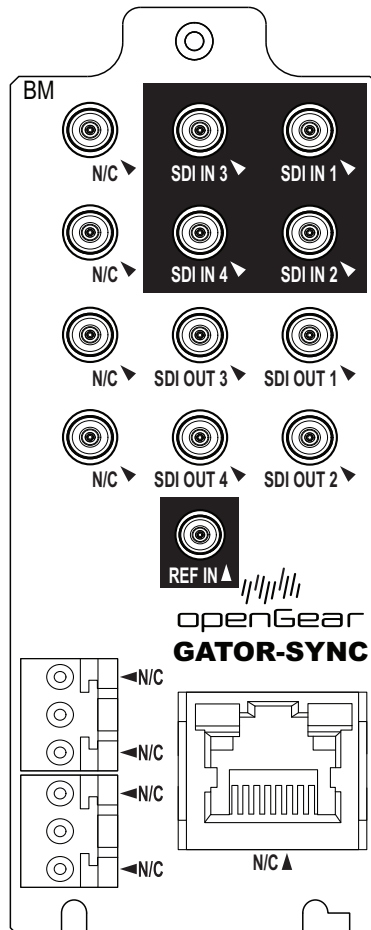


Figure 5 Cabling Designations — 8323AR-325 Rear Module

For More Information on...

- installing the rear module, refer to the section “**Installing the Rear Module into the openGear Frame**”.
- cabling the inputs and outputs, refer to the chapter “**Cabling**”.

Physical Installation

Installing an GATOR-SYNC 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-SYNC card into the required frame slot.

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

For More Information on...

- the technical specifications for the GATOR-SYNC, refer to the chapter “**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-SYNC.
- If the rear module is already installed in the openGear frame, proceed to the section “**Installing the GATOR-SYNC 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 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-SYNC into.
2. If you are using an 8322AR-317, it is recommended to use the following slot combinations:
 - Slots 1, 2, 3, 4
 - Slots 5, 6, 7, 8
 - Slots 9, 10, 11, 12
 - Slots 13, 14, 15, 16
 - Slots 17, 18, 19, 20
3. Use a Phillips screwdriver to unfasten each blank plate from the openGear backplane.
4. 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 the section **"Installing the GATOR-SYNC 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.

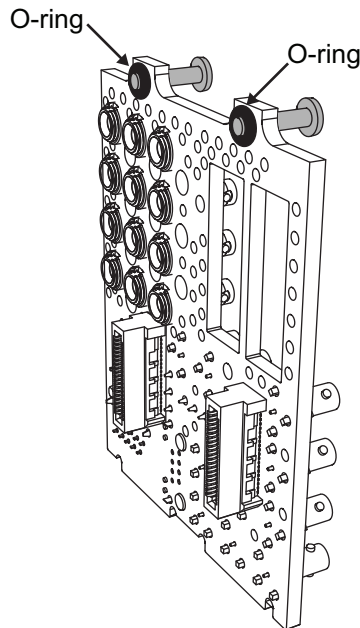


Figure 6 Location of the O-ring on the Rear Module

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-SYNC card aligns with the rear module.

Installing the GATOR-SYNC Card into an openGear Frame

The slot the GATOR-SYNC 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 1** for valid slot combinations when using the 8322AR-317 rear module.

Table 1 Card Slot Combinations — 8322AR-317

Rear Module is Installed in	Card Installs into Slot
Slots 1, 2, 3, 4	2
Slots 5, 6, 7, 8	6
Slots 9, 10, 11, 12	10
Slots 13, 14, 15, 16	14
Slots 17, 18, 19, 20	18

Refer to **Table 2** for valid slot combinations when using the 8323AR-325 rear module.

Table 2 Card Slot Combinations — 8323AR-325

Rear Module is Installed in	Card Installs into Slot
Slots 1, 2	1
Slots 3, 4	3
Slots 5, 6	5
Slots 7, 8	7
Slots 9, 10	9
Slots 11, 12	11
Slots 13, 14	13
Slots 15, 16	15
Slots 17, 18	17
Slots 19, 20	19

To install the GATOR-SYNC into the openGear frame

1. Locate the slot the GATOR-SYNC card will slide into as follows:
2. Verify that the GATOR-SYNC 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-SYNC, contact us at the numbers listed in the section “**Contacting Technical Support**”. Our technical staff is always available for consultation, training, or service.

- ★ While the examples in this chapter depict the 8322AR-317 rear module, the information is also applicable to the 8323AR-325.

For More Information on...

- the specifications for the GATOR-SYNC, refer to the chapter “**Technical Specifications**”.

Cabling the Ethernet Port on the openGear Frame

The GATOR-SYNC is connected to your network via the MFC-OG3-N in the openGear frame. This enables the GATOR-SYNC 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-SYNC.

- ★ The GATOR-SYNC requires the MFC-OG3-N Network Controller card to be installed in the openGear frame. The MFC-8322-S does not support the GATOR-SYNC.
- ★ You must provide an Ethernet connection to the openGear frame as outlined in the manual that accompanied your frame.

For More Information on...

- cabling the Ethernet port on the openGear frame, refer to the ***openGear Series User Manual***.

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-SYNC.

For More Information on...

- downloading and installing DashBoard, refer to the ***DashBoard User Manual***.
- configuring the Ethernet port on the openGear frame refer to the ***openGear Series User Manual***.
- ★ Contact your network administrator if problems are experienced when connecting to a network hub.

Cabling for the Reference Input for an GATOR-SYNC

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

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

For More Information on...

- specifying the analog reference source for your card, refer to the chapter “**Reference Setup**”.

To connect a reference source to the GATOR-SYNC rear module

1. Connect one end of a Belden cable to the **REF IN** HD-BNC on the GATOR-SYNC rear module.
2. Connect the other end of the same Belden cable to the applicable output port on the external reference source device.

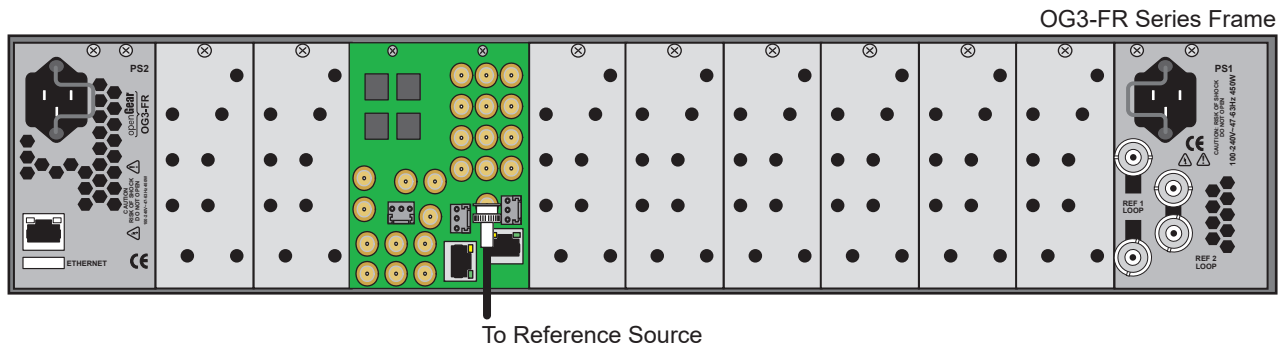


Figure 7 GATOR-SYNC — Reference Input Cabling on the 8322AR-317 Rear Module

Video Signal Cabling

Each rear module provides connections for up to four SDI inputs and four SDI outputs.

SDI Inputs

Connect your input video signals to the SDI IN HD-BNCs on the rear module as required. There are four HD-BNC SDI inputs available on each rear module. (**Figure 8**)

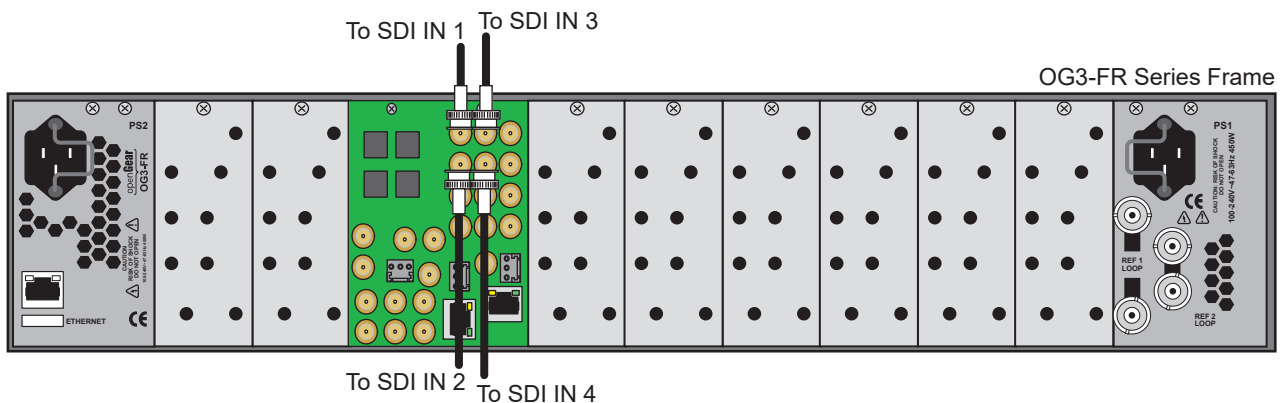


Figure 8 8322AR-317 Rear Module Cabling — SDI Inputs

SDI Outputs

Connect your destination devices to the SDI OUT HD-BNCs on the rear module as required. There are four HD-BNC SDI outputs available on each rear module. (**Figure 9**)

Getting Started

This chapter provides instructions for launching DashBoard, assigning an initial IP address to the GATOR-SYNC, and accessing the GATOR-SYNC interfaces in DashBoard.

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

Before You Begin

Ensure that:

- An MFC-OG3-N or an MFC-8322-N Network Controller Card installed in your openGear frame.
- The openGear frame that houses the GATOR-SYNC displays in the Basic Tree View of DashBoard.
- The GATOR-SYNC displays as a sub-node in the openGear frame tree.
- Your facility IT Department provided the required network settings to be assigned to the GATOR-SYNC.

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-SYNC interfaces in DashBoard, refer to the chapter **“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-SYNC 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-SYNC and update the Basic Tree View with the GATOR-SYNC sub-node.

★ This procedure requires a reboot of the card.

To assign the initial network settings for the GATOR-SYNC

1. Launch DashBoard.
2. Expand the openGear frame node to display a list of cards installed in that frame.
3. Double-click the **GATOR-SYNC** 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-SYNC 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 openGear frame node to display a list of sub-nodes.
 - d. Verify that the GATOR-SYNC displays as seen in the example below.



Accessing the GATOR-SYNC Interfaces in DashBoard

The interfaces are accessed by double-clicking the GATOR-SYNC node in the DashBoard Tree View.

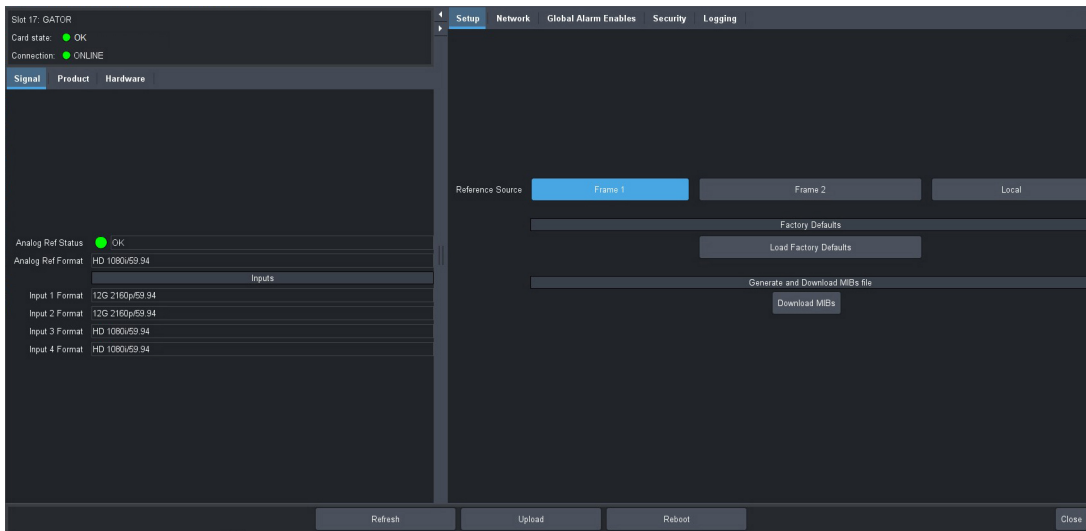
To access the GATOR-SYNC interfaces in DashBoard

1. Launch DashBoard.
2. In the Basic Tree View of DashBoard, locate the openGear frame the GATOR-SYNC is installed in.
3. Expand the openGear frame node to display a list of sub-nodes.
4. Locate the GATOR-SYNC node in the frame tree.
5. Expand the GATOR-SYNC node to display a list of sub-nodes for the card.

The first sub-node provides access to the global settings for the card while each subsequent sub-node represents a Frame Sync.

6. Double-click a sub-node to display the GATOR-SYNC interface in the right pane of the DashBoard window.

In the example below, the **Global** sub-node was selected.



7. Select a tab to display its options in the DashBoard window.
In the example above, the Signal and Setup tabs are selected.

Configuring the Remote Logging Feature

The GATOR-SYNC enables you to implement a streaming log that captures status information of the system. This feature is useful for troubleshooting.

- ★ A centralized Syslog server must be installed in your system. Refer to the documentation that accompanied your centralized Syslog server for installation and setup information.

To configure the remote logging feature

1. In the Tree View of DashBoard, expand the GATOR-SYNC node.
2. Double-click the **Global** sub-node to display the Global interface in the right-half of the DashBoard window.
3. Select the **Logging** tab.
4. Use the **Remote Logging** field to specify the IP Address of the device that will capture and store the status information of the GATOR-SYNC.
- ★ You must press **Enter** after typing the IP Address into the **Remote Logging** field.
5. Reboot the GATOR-SYNC card as follows:
 - a. Click **Reboot**. This button is located on the bottom of the tab.
 - b. Monitor the reboot progress.

Reference Setup

The openGear frame supports a distributed frame reference, allowing incoming reference signals to feed timing information to all openGear cards in that frame. Thus, a single signal can be used for multiple cards.

- ★ The procedures in this chapter assume that you have launched DashBoard and the GATOR-SYNC interface displays in the right-pane of the DashBoard window.

Frame Rate Compatibility

The GATOR-SYNC video output frame rate must match the frame rate of the selected (analog or digital) reference frame rate. **Table 3** provides an outlines the GATOR-SYNC frame rate compatibility.

The card allows you to use any interlaced video format to operate the card in any format of the same frequency; however, the use of 480i or 576i (Composite Sync) reference signals for High Definition (720p, 1080i, or 1080p) video modes is not recommended.

- ★ 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.
- ★ When using a progressive format reference signal to lock an interlaced format video signal, the lock will be Frame Locked but Field indeterminate.

Table 3 Output/Reference Compatibility

Card Format	Required Reference
HD Formats	
720p 50Hz	576i 50Hz
	720p 50Hz
	1080i 50Hz
	1080p 25Hz
720p 59.94Hz	480i 59.94Hz
	720p 59.94Hz
	1080i 59.94Hz
720p 59.94Hz	1080p 29.97Hz
720p 60Hz	720p 60Hz
	1080i 60Hz
	1080p 30Hz
1080i 50Hz	576i 50Hz
	720p 50Hz
	1080i 50Hz
	1080p 25Hz

Table 3 Output/Reference Compatibility

Card Format	Required Reference
1080i 59.94Hz	480i 59.94Hz
	720p 59.94Hz
	1080i 59.94Hz
	1080p 29.97Hz
1080i 60Hz	720p 60Hz
	1080i 60Hz
	1080p 30Hz
1080pSF 23.98Hz	1080pSF 23.98Hz
1080pSF 24Hz	1080pSF 24Hz
1080p 23.98Hz	1080p 23.98Hz
1080p 24Hz	1080p 24Hz
1080p 25Hz	576i 50Hz
	720p 50Hz
	1080i 50Hz
	1080p 25Hz
1080p 29.97Hz	480i 59.94Hz
	720p 59.94Hz
	1080i 59.94Hz
	1080p 29.97Hz
1080p 30Hz	720p 60Hz
	1080i 60Hz
	1080p 30Hz
1080p 50Hz Level A	576i 50Hz
1080p 50Hz Level A	720p 50Hz
	1080i 50Hz
	1080p 25Hz
1080p 59.94Hz Level A	480i 59.94Hz
	720p 59.94Hz
	1080i 59.94Hz
	1080p 29.97Hz
1080p 60Hz Level A	720p 60Hz
	1080i 60Hz
	1080p 30Hz
UHD Formats^a	
2160p 23.98Hz	1080p 23.98Hz
2160p 24Hz	1080p 24Hz

Table 3 Output/Reference Compatibility

Card Format	Required Reference
2160p 25Hz	576i 50Hz
	720p 50Hz
	1080i 50Hz
	1080p 25Hz
2160p 29.97Hz	480i 59.94Hz
	720p 59.94Hz
	1080i 59.94Hz
	1080p 29.97Hz
2160p 30Hz	720p 60Hz
	1080i 60Hz
	1080p 30Hz
2160p 50Hz	576i 50Hz
	720p 50Hz
	1080i 50Hz
	1080p 25Hz
2160p 59.94Hz	480i 59.94Hz
	720p 59.94Hz
	1080i 59.94Hz
	1080p 29.97Hz
2160p 60Hz	720p 60Hz
	1080i 60Hz
	1080p 30Hz

a. Requires the GATOR-SYNC-UHD-LICENSE. Refer to "Installing a License Key".

- ★ To lock properly, the reference frame rate and the video output frame rate should be in a ratio of 1:1 or 1:2. An example of the 1:1 ratio would be a 29.97Hz reference frame rate (e.g. 480i 59.94Hz, 1080i 59.94Hz), and a 29.97Hz video output frame rate (like 480i 59.94Hz, 1080i 59.94Hz, 1080p 29Hz, 2160p 29Hz). An example of the 1:2 ratio would be a 29.97Hz reference frame rate (e.g. 480i 59.94Hz, 1080i 59.94Hz), and a 59.94Hz video output frame rate (e.g. 720p 59.94Hz, 1080p 59.94Hz, 2160p 59.94Hz).

Specifying a Global Analog Reference Source

If the reference signal is valid, and if the frame timing settings is greater than or equal to 1, the card is automatically set to Frame Sync mode. If a valid reference is selected, and then removed, the card will remain in Frame Sync mode but will flywheel. This means that the card will be dropping or repeating the display of some video input frames as necessary to keep the input to output delay within the specified range of F to F+1 frames delay. The frame drop/repeat occurs whenever the video input frame start point crosses over the video output frame start point.

The card has built-in hysteresis to avoid visible artifacts if the input and output timing alignment oscillates around the drop/repeat cross-over point.

To specify a global analog reference source for the GATOR-SYNC

1. In the Tree View of DashBoard, expand the GATOR-SYNC node.
 2. Double-click the **Global** sub-node to display the Global interface in the right-half of the DashBoard window.
 3. Select the **Setup** tab.
 4. Use the **Reference Source** menu to specify the source for the reference input signal.
Once set, this Analog Reference Source can be assigned as the reference source for any of the Frame Sync.
- ★ If you select **Frame 1** or **Frame 2**, the Frame Sync input video frame rate must match this reference frame rate.

For More Information on...

- specifying a reference source, refer to “Specifying the Reference for a Frame Sync”.

Monitoring the Reference Signal via DashBoard

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

To configure the reference alarm for the GATOR-SYNC

1. In the Tree View of DashBoard, expand the GATOR-SYNC node.
2. Double-click the **Global** sub-node.
The Global interface opens in the right-half of the DashBoard window.
3. Select the **Global Alarm Enables** tab.
4. 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 analog reference signal is not detected.

Frame Sync Setup

Each Frame Sync is represented as a separate GATOR-SYNC sub-node in the Basic Tree View. This enables you to configure each Frame Sync independently. Double-click a Frame Sync node to display its settings in DashBoard.

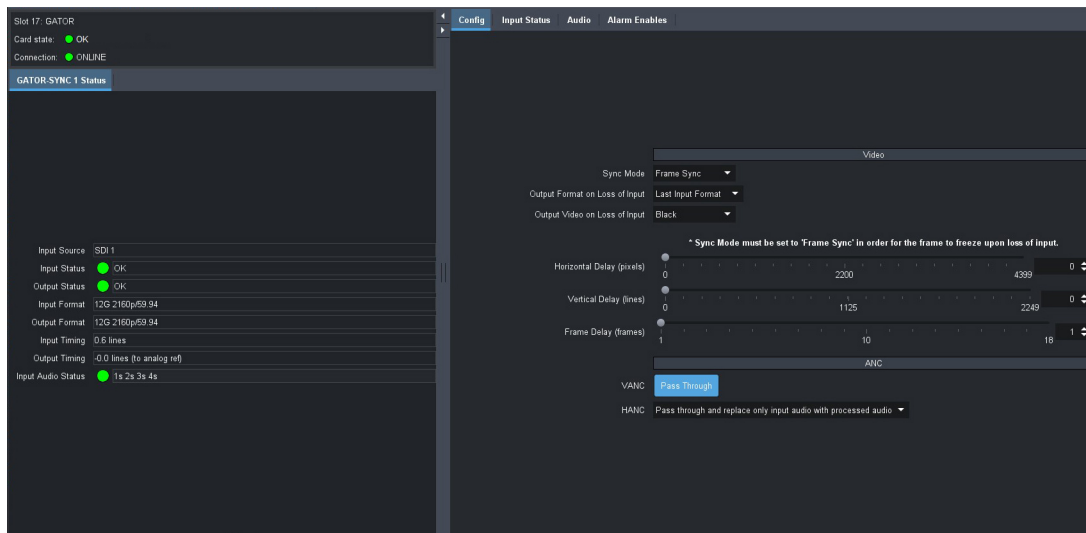
Specifying the Reference for a Frame Sync

Each Frame Sync can be independently configured to use either the card-wide reference signal, as defined by the Analog Reference setting in the Global > Setup tab, or the input signal on the corresponding SDI input.

To configure the reference for a Frame Sync on the GATOR-SYNC

1. In the Tree View of DashBoard, expand the GATOR-SYNC node.
2. Double-click the **GATOR-SYNC** sub-node for the Frame Sync you want to configure.

The **GATOR-SYNC** interface opens in the right-half of the DashBoard window with the Config tab automatically selected.



3. Use the **Sync Mode** menu to specify the reference input signal for the specified Frame Sync. Choose from the following:
 - **Frame Sync** — the Frame Sync uses the analog reference signal that is specified in the Global > Setup > Analog Reference Source menu. Select this mode if the **Output Video on Loss of Input** is set to **Freeze**.
 - **Frame Delay** — the Frame Sync uses the digital reference signal extracted from the corresponding SDI IN BNC of the rear module. For example, **Frame Sync 1** uses the input signal detected on the **SDI IN 1** BNC.

Specifying the Output During a Loss of Input

The GATOR-SYNC enables you to specify the output during a loss of input signal, or during a change of input format. The embedded audio will also go silent if passing from input to output (when another audio is not enabled).

To specify the output if the video input signal is lost

1. In the Tree View of DashBoard, expand the GATOR-SYNC node.
2. Double-click the **GATOR-SYNC** sub-node for the Frame Sync you want to configure.
The **GATOR-SYNC** interface opens in the right-half of the DashBoard window with the Config tab automatically selected.
3. Use the **Output Format on Loss of Input** menu to specify the output video format when the card experiences a loss of input signal.
4. Use the **Output Video on Loss of Input** menu to specify what to output when the card experiences a loss of input. Choose from the following:
 - **Black** — the Frame Sync will output black in the event of a loss of video input signal.
 - **Freeze** — displays the last captured frame of video from the input signal. Ensure that the:
 - › **Output Format on Loss of Input** menu is set to the same format as the input video signal or to the last known input format. If not, the card will not output a Freeze Frame, but a full Field Black image in the format selected in the **Output Format on Loss of Input** menu.
 - › The **Sync Mode** is set to **Frame Sync**.

Configuring the Delay for a Frame Sync Output

The GATOR-SYNC is suited to solve system timing problems where the difference in delay is constant between two paths. An example of this would be a situation where a downstream switcher needs to have clean switches between the output of a production switcher and some of the same input sources fed to the production switcher. The GATOR-SYNC cannot completely correct badly missed switches, signal drops, or similar issues unless the user has chosen to add at least 1 frame of delay.

- ★ The **Input Timing** field of the **GATOR-SYNC > Status** tab reports the input video timing with respect to the selected analog reference signal.

Adding a Delay

The delay values can be adjusted from 0 to a maximum limit that depends on the video format. Refer to **Table 4** for the range of available delay values.

Table 4 Delay Range

Format	Range of Values		
	Horizontal Delay (pixels)	Vertical Delay (lines)	Frame Delay (frames)
1080p 59.94	0-2199	0-1124	0-79
1080p 50	0-2639	0-1124	0-64
1080p 29.97	0-2199	0-1124	0-79
2160p 59.94	0-4399	0-2249	0-18
2160p 50	0-5179	0-2249	0-14
1080i 59.94	0-2199	0-1124	0-79

Table 4 Delay Range

Format	Range of Values		
	Horizontal Delay (pixels)	Vertical Delay (lines)	Frame Delay (frames)
1080i 50	0-2639	0-1124	0-64
1080pSF 24	0-2749	0-1124	0-62
1080pSF 23.98	0-2749	0-1124	0-62
720p 59.94	0-1649	0-749	0-153
720p 50	0-1979	0-749	0-125

To add a delay to the Frame Sync video output

1. In the Tree View of DashBoard, expand the GATOR-SYNC node.
2. Double-click the **GATOR-SYNC** sub-node for the Frame Sync you want to configure.
The interface opens in the right-half of the DashBoard window with the **Config** tab automatically selected.
3. Use the **Horizontal Delay** field to specify the horizontal delay, relative to the selected reference. Adjustments are made in pixel increments.
4. Use the **Vertical Delay** field to specify the vertical delay, relative to the selected reference. Adjustments are made in line increments.
5. Use the **Frame Delay** field to specify the delay in number of frames. Frame delay adjustments are made in full frame increments.

ANC Processing

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 section briefly summarizes the ANC processing features of the GATOR-SYNC.

The ANC Pass Through settings only apply when the output and the input have the same format. If the input is not synchronous to the output, entire frames of data are duplicated or dropped as part of the Frame Sync behavior. This feature will pass the entire HANC and/or VANC region without modification except for very limited error corrections to keep the video stream within specifications (values of 0x000 or 0x3FF will be clipped if not part of a packet header, and EDH is re-generated).

- ★ If the ANC Pass Through features are enabled, and the input format changes, there will be a discontinuity that can cause errors such as the audio to click, audio CRC errors, or closed captioning errors.

To pass through VANC data on a Frame Sync output

1. In the Tree View of DashBoard, expand the GATOR-SYNC node.
 2. Double-click the **GATOR-SYNC** sub-node for the channel you want to configure.
The interface opens in the right-half of the DashBoard window with the **Config** tab automatically selected.
 3. Click the **VANC Pass Through** button in the **ANC** area of the tab.
The button label changes to **Enabled** and the button is now lit.
- ★ If the VANC Pass Through features are enabled, and the input signal is invalid, an AFD packet is inserted.

To pass through HANC data on a Frame Sync output

1. In the Tree View of DashBoard, expand the GATOR-SYNC node.
2. Double-click the **GATOR-SYNC** sub-node for the channel you want to configure.
The interface opens in the right-half of the DashBoard window with the **Config** tab automatically selected.
3. Use the **HANC** menu to specify how to process the HANC data. Choose from the following:
 - **Pass Through** — the data in the HANC passes through to the output without changes.
 - **Delete all HANC data and leave blank** — all data in the HANC is deleted; no data is passed through.
 - **Pass through and replace only input audio with process audio** — all HANC data, except the input audio data, is passed through unchanged. The input audio data in the HANC is replaced with the embedded audio configured by the card.
 - **Delete all HANC data and insert processed audio** — all HANC data is deleted. The embedded audio configured by the card is added to the HANC.

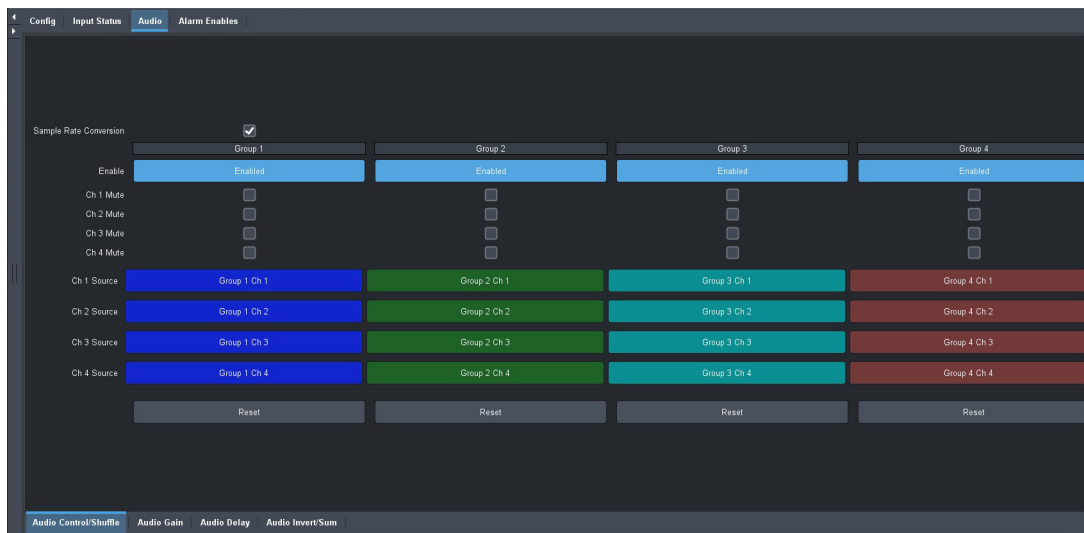
Enabling Audio Processing

The Audio Processing box must be selected in order for Proc Amp adjustments to take effect on the output.

To enable processing on the audio output of a Frame Sync

1. In the Tree View of DashBoard, expand the GATOR-SYNC node.
2. Double-click the **GATOR-SYNC** sub-node for the channel you want to configure.
3. Select the **Audio** tab.

The **Audio Control/Shuffle** sub-tab is automatically selected.



4. Select the **Enable** button for each required audio group(s).
The button label displays **"Enabled"**.

Enabling Sample Rate Conversion

Sample Rate Conversion (SRC) should only be used with Pulse Code Modulation (PCM) digital audio and not any form of compressed signal, such as Dolby®. The SRC for each Frame Sync is enabled independently.

To enable SRC on the output of a Frame Sync

1. In the Tree View of DashBoard, expand the GATOR-SYNC node.
2. Double-click the **GATOR-SYNC** sub-node for the channel you want to configure.
3. Select the **Audio** tab.
The **Audio Control/Shuffle** sub-tab is automatically selected.
4. Select the **Sample Rate Conversion** box.

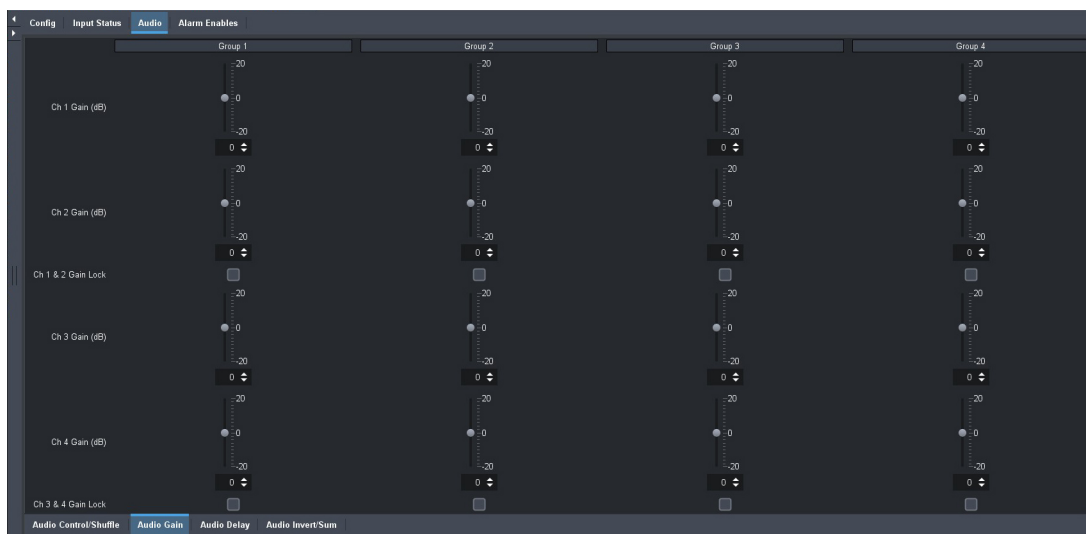
Adjusting the Audio

The embedded audio output Proc Amp adjustments are applied in the following order:

- **Delay** — This option enables you to adjust the delay of the audio channel. If you have enabled the Delay Lock feature, changing the delay value for one channel automatically changes the value for the other channel.
- **Gain** — This option provides a +/- 20dB gain range in 1dB increments. If you have enabled the Gain Lock feature, changing the gain value for one channel automatically changes the value for the other channel.
- **Invert** — This option enables you to invert the polarity of the audio signal for the selected channel.
- **Sum** — This option enables both channels to carry the average of the two selected input channels $((A+B)/2)$.

To adjust the gain on the audio output of a Frame Sync

1. In the Tree View of DashBoard, expand the GATOR-SYNC node.
2. Double-click the **GATOR-SYNC** sub-node for the channel you want to configure.
3. Select **Audio > Audio Gain**.

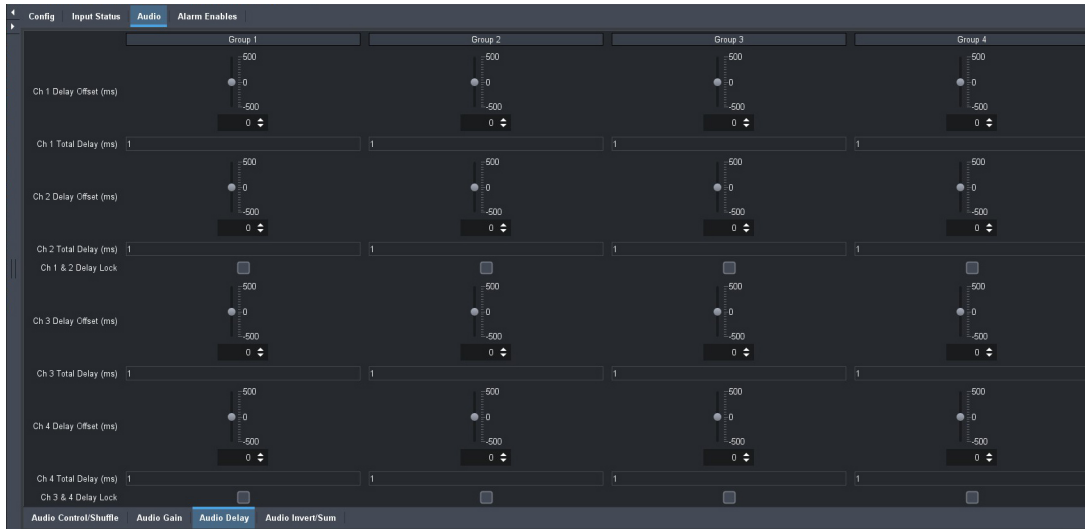


4. Use the **Ch Gain** slider to adjust the gain of the specified audio channel.

- ★ Use the **Gain Lock** options to lock the sliders of both channels together. If the values for the two channels are different, that difference is maintained when the channels are locked.

To adjust the audio delay

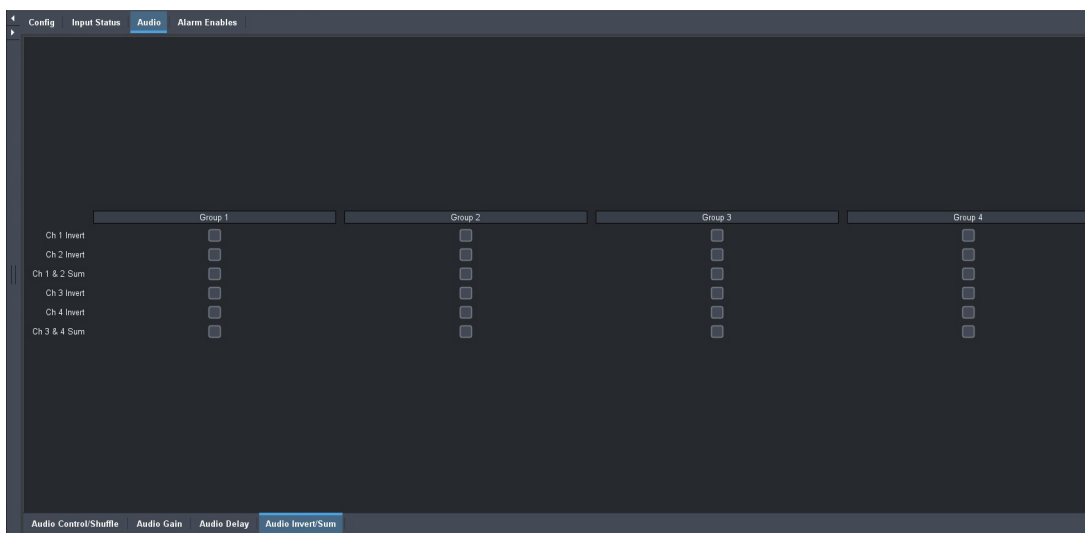
1. In the Tree View of DashBoard, expand the GATOR-SYNC node.
2. Double-click the **GATOR-SYNC** sub-node for the channel you want to configure.
3. Select **Audio > Audio Delay**.



4. Use the **Ch Delay Offset** slider to adjust the delay of the specified audio channel.
- ★ Use the **Delay Lock** boxes to lock the sliders of both channels together. If the values for the two channels are different, that difference is maintained when the channels are locked.

To invert an audio channel

1. In the Tree View of DashBoard, expand the GATOR-SYNC node.
2. Double-click the **GATOR-SYNC** sub-node for the channel you want to configure.
3. Select **Audio > Audio Invert/Sum**.



4. Select the **Ch Invert** box to invert the audio signal of the specified channel.

To sum two audio channels

★ You can sum every adjacent pair of audio groups with the first channel on the Odd Channel numbers (e.g. Channels 1 and 2, Channels 3 and 4).

1. In the Tree View of DashBoard, expand the GATOR-SYNC node.
2. Double-click the **GATOR-SYNC** sub-node for the channel you want to configure.
3. Select **Audio > Audio Invert/Sum**.
4. Select the **Ch Sum** box to enable the specified channels to carry the average of their inputs $((A+B)/2)$.

Muting an Audio Channel

The GATOR-SYNC provides the ability to individually mute each of the 4 channels in each audio group.

To mute an audio channel

1. In the Tree View of DashBoard, expand the GATOR-SYNC node.
2. Double-click the **GATOR-SYNC** sub-node for the channel you want to configure.
3. Select the **Audio** tab.

The **Audio Control/Shuffle** sub-tab is automatically selected.

4. Locate the **Group** column you want to mute the channel for.
5. Select the **Ch # Mute** box to mute a specific channel within a specific group.

Shuffling the Audio Channels

The GATOR-SYNC enables you to modify the map of embedded audio channels. You can shuffle the 16 audio channels within the embedded group (of the originating video stream) with no de-embedding required. This re-shuffle is invoked in real time.

★ If the selected source is not present on the input video, silence is embedded.

To shuffle the audio channels for an audio group

1. In the Tree View of DashBoard, expand the GATOR-SYNC node.
2. Double-click the **GATOR-SYNC** sub-node for the channel you want to configure.
3. Select the **Audio** tab.

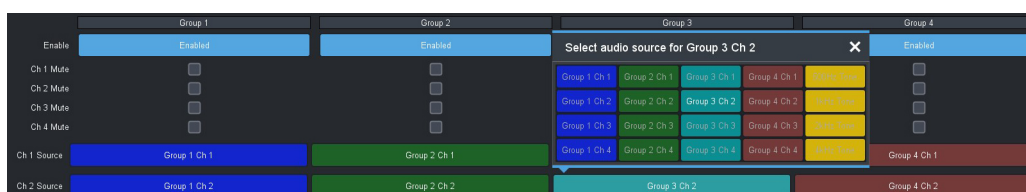
The **Audio Control/Shuffle** sub-tab is automatically selected.

4. Locate the **Group** column you want to shuffle the channels for.
5. Click the button for the Channel you want to assign a new source for.

The Select Audio Source dialog opens.

6. Select the audio source to assign to the Channel.

In the following example, the user selected Group 3 Ch 2.



Embedding PCM and Non-PCM Signals

This section provides additional information on the Processing Amplifiers (Proc Amps) for the audio outputs on the card.

Embedding PCM Signal

Each card can embed PCM audio from the embedded audio of the source video. Processing also includes embedding channel status data as per **Table 13.1**.

Embedding Non-PCM Signals

You can configure the card to embed non-PCM signals, such as Dolby® Digital and Dolby® E, using the options available in DashBoard. However, when embedding the non-PCM signal, the A and B channels of the input signal must be embedded on Channels 1 and 2, or Channels 3 and 4 of a given group.

To embed non-PCM signals

1. In the Tree View of DashBoard, double-click the GATOR-SYNC node.
2. Double-click the **GATOR-SYNC** sub-node for the Frame Sync you want to configure.
The **GATOR-SYNC** interface opens in the right-half of the DashBoard window with the Config tab automatically selected.
3. Disable the SRC as follows:
 - a. Select the **Audio** tab.
The **Audio Control/Shuffle** sub-tab is automatically selected.
 - a. Clear the **Sample Rate Conversion** box.
4. Disable the inversion and summing of the applicable channels as follows:
 - a. Select the **Audio Invert/Sum** sub-tab.
 - b. Clear the applicable **Ch # Sum** box.
 - c. Clear the applicable **Ch # Invert** box to disable inverting on the channel.
5. Set the audio gain to 0 (zero) as follows:
 - a. Select the **Audio Gain** sub-tab.
 - b. Set the applicable **Ch # Gain** to **0**.
6. Ensure the delay for each channel match as follows:
 - a. Select the **Audio Delay** sub-tab.
 - b. Compare the **Ch # Delay** values of the channels.

Resetting the Audio Proc Amp Settings

You can reset the audio proc values for an audio channel pair using the applicable **Reset** button on the Audio Control/Shuffle tab. To reset the audio Proc Amp settings

1. In the Tree View of DashBoard, expand the GATOR-SYNC node.
2. Double-click the **GATOR-SYNC** sub-node for the channel you want to configure.
The Channel interface opens in the right-half of the DashBoard window.
3. Select the **Audio** tab.
The **Audio Control/Shuffle** sub-tab is automatically selected.

4. Click the **Reset** for the applicable audio group/channel.


The following audio settings are reset:

- Ch # Mute
- Ch # Gain
- Ch # Gain Lock
- Ch # Delay Offset
- Ch # Delay Lock
- Ch # Invert
- Ch # Sum

Upgrading the Software

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

To upgrade the software on a card

1. Contact Ross Technical Support for the latest software version file.
 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-SYNC 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. Note that 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-SYNC. The configuration, monitoring, and operating features are organized as a series of nodes and tabs in a DashBoard client window. This chapter summarizes the interfaces, and tabs available from DashBoard for the GATOR-SYNC.

Global Interface

The Global interface is accessed by double-clicking the Global sub-node in the GATOR-SYNC tree. This interface provides read-only hardware information, status, and general product setup for your GATOR-SYNC. There are two distinct panes in the Global interface: Status (in the left pane), and Configuration (in the right pane).

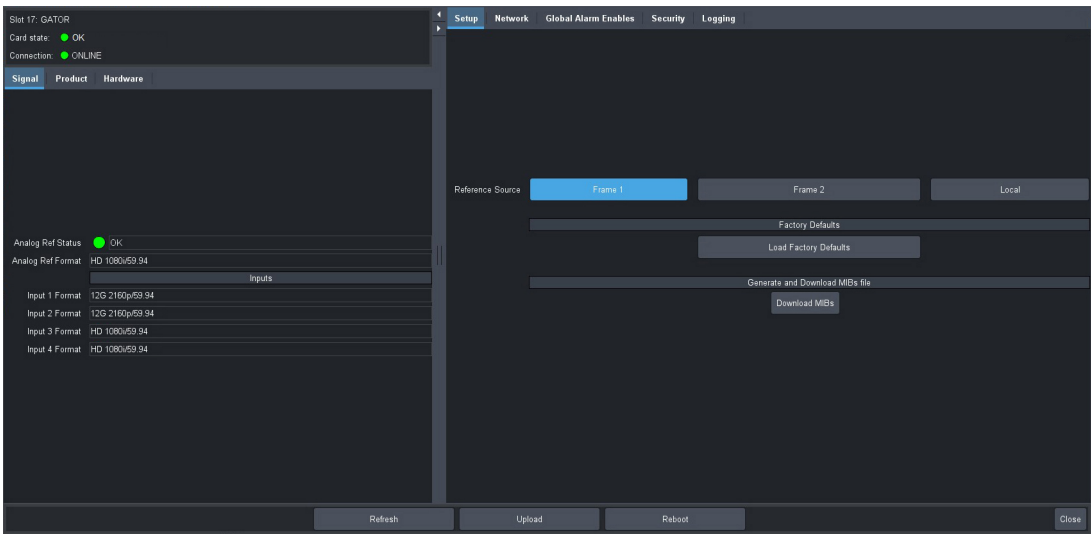


Figure 10 Example of the Global Interface

Signal Tab

Table 5 summarizes the read-only fields displayed in the **Signal** tab.

Table 5 *Signal Tab*

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

Table 5 Signal Tab

Item	Parameters	Description
Inputs		
Input # Format	#	A valid SDI signal is detected on the input, the format is supported, and the selected reference signal is supported and compatible
	N/A	An invalid SDI signal is detected on the input

Product Tab

Table 6 summarizes the read-only information displayed in the Product area.

Table 6 Product Tab

Item	Parameters	Description
Product	GATOR	
Supplier	Ross Video Ltd.	
Board Rev	#	Indicates the hardware version
Serial Number	#	Indicates the serial number of the card
Rear Module	#	Indicates the rear module the card is installed in
Rear Module Status	OK (Green)	A supported rear module is installed with the card
	Alarm suppressed (Green)	An unsupported rear module is installed by the Global Alarm Enables > Incompat Rear Module option is disabled (box is not selected)
	Incomp I/O Module (Red)	Card is connected to an unsupported rear module
Software Rev	v#.#-#	Indicates the software version running on the card
Firmware Rev	##	Indicates the firmware version running on the card
CPLD Rev	##	Indicates the complex programmable logic device version of the GATOR-SYNC
Daughter Card		
Type	#	Indicates the daughter card model installed on the card
Variant	#	
Issue	#	Indicates the hardware version of the daughter card

Hardware Tab

Table 7 summarizes the read-only information displayed in the Hardware tab.

Table 7 Hardware Tab

Item	Parameters	Description
Hardware Status	OK (Green)	The fans are operating correctly and no errors are detected
	Alarm suppressed (Green)	There are fan errors detected but the Global Alarm Enables > Stalled Fan option is disabled (box is not selected)
	Critical Temperature (Red)	An error with the fans is occurring. Verify that the fans and airflow for the card is valid.
	Fan Off/Stalled (Red)	
Voltage (V)	#	Measured input voltage
Current (mA)	#	Current consumption in milliamperes
Power (W)	#	Power consumption in watts
Daughter Board Voltage (mV)	#	Input voltage of the audio daughter board
Daughter Board Current (mA)	#	Current consumption of the audio daughter board
Daughter Board Power (W)	#	Power consumption of the audio daughter board
FPGA Temp (C)	#C / #F	<p>Indicates the FPGA Core temperature where:</p> <ul style="list-style-type: none"> • A green indicator displays when the temperature is less than 95°C. • A yellow indicator displays when the temperature is greater than or equal to 95°C. • A red indicator displays when the temperature is greater than or equal to 100°C. <p>* If the temperature is greater than 100°C, the user must manually shut off the card.</p>
AXI Bridge	#	The Advanced extensible interface bridge is running correctly on the GATOR-SYNC. This information is only used by Ross Technical Support.
Fan Speed	#	Reports the speed (rpm) of the specified SOC Fan
CPU Usage	x.xx / y.yy / z.zz	<p>Displays the CPU Load average where:</p> <ul style="list-style-type: none"> • x.xx represents in the last minute • y.yy represents the last five minutes • z.zz represents the last fifteen minutes
RAM Available	# / #.## MB	CPU Memory Used / Total CPU Memory

Setup Tab

Table 8 summarizes the options displayed in the Setup tab.

Table 8 Setup Tab

Item	Parameters	Description
Reference Source	Frame 1	Uses the reference signal connected to the REF 1 BNC on the openGear frame
	Frame 2	Uses the reference signal connected to the REF 2 BNC on the openGear frame
	Local	Uses the reference signal connected to the REF IN port on the GATOR-SYNC rear module
Factory Defaults		
Load Factory Defaults	All editable parameters in DashBoard, except those on the Network tab, are reset to the factory default values	
Generate and Download MIBs File		
Download MIBs	Downloads the Management Information Base (MIB) file that provides the SNMP controls for your card	

Network Tab

Table 9 summarizes the menus and read-only fields displayed in the Network tab.

Table 9 Network

Item	Parameters	Description
Network Time		
Use time from Frame Network Controller	Selected	Enables the GATOR-SYNC to use the time data reported by the MFC-OG3-N or MFC-OGX-N that is installed in the same openGear frame
	Cleared	
Default Gateway		
Current (read-only)	###.###	Indicates the gateway for communications outside of the local area network (LAN)
Static Gateway	###.###	The Gateway for the GATOR-SYNC that the user manually assigned
openGear Chassis RJ-45		
Link Status (read-only)	OK (Green)	The GATOR-SYNC is communicating on the network via the Network Controller Card
	Invalid Subnet Mask (Yellow)	The Current Subnet Mask value is set incorrectly or is invalid within your network
	Apply/Cancel Changes (Yellow)	One or more setting on this tab was changed but the Apply button was not selected
	Link Down (Red)	The link for the Network Controller Card is invalid

Table 9 Network

Item	Parameters	Description
Current IP Address (read-only)	###.###	Indicates the IP Address currently assigned to the GATOR-SYNC via the Network Controller Card
Current Subnet Mask (read-only)	###.###	Indicates the subnet mask for the GATOR-SYNC
MAC Address (read-only)	#	Indicates the MAC Address currently assigned to the GATOR-SYNC
Mode	Static	The user manually supplies the network settings for the GATOR-SYNC
	DHCP*	Automates the assignment of network settings for the GATOR-SYNC
Static IP Address	#	The IP Address for the GATOR-SYNC that the user manually assigned
Subnet Mask	#	The Subnet Mask for the GATOR-SYNC that the user manually assigned

Global Alarm Enables Tab

Table 10 summarizes the options displayed in the Global Alarm Enables tab.

Table 10 Global Alarm Enables Tab

Item	Parameters	Description
Network Time		
Network time (read-only)	#	Displays the time data transmitted by the Frame Controller card in the same openGear frame. Requires that the Global > Network > Use time from Frame Controller box is selected.
Alarm Enable	Selected	The GATOR-SYNC reports the NTP time as provided by the Frame Controller card
	Cleared*	Disables this alarm
Rear Module Alarm		
Rear Module (read-only)	This field replicates the information displayed in the Product > Rear Module Status field	
Alarm Enable	Selected*	The Global > Product > Rear Module Status field reports when a rear module is not compatible with the card
	Cleared	Disables this alarm
Fan Alarm		
Fan Speed (read-only)	#	Reports the fan speed (rpm) of the fan on the board

Table 10 Global Alarm Enables Tab

Item	Parameters	Description
Alarm Enable	Selected*	The GATOR-SYNC 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-SYNC
	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)	Each field duplicates the information reported in the GATOR-SYNC > Input Status fields	
Alarm Enable	Selected*	GATOR-SYNC reports a loss of the specified input or if the format is incompatible for the specified input
	Cleared	Disables this alarm

Security Tab

Table 11 summarizes the options displayed in the Security tab.

Table 11 Security Tab

Item	Parameters	Description
Security Configuration		
SSH Login	Disable*	Disables the ability to log onto the GATOR-SYNC via an SSH server
	Enable	The GATOR-SYNC can be accessed via a secure channel by an SSH server

Logging Tab

Table 12 summarizes the menus and read-only fields displayed in the Logging tab.

Table 12 Logging Tab

Item	Parameters	Description
Logging Level	Filters the events the System Log captures	
Remote Logging	###.###	Specifies the IP Address for the external device that is logging the communication activity for the GATOR-SYNC
System Log	Displays the events logged for the GATOR-SYNC since the last time the log was cleared	

GATOR-SYNC Interfaces

Each Frame Sync is represented as a sub-node in the GATOR-SYNC tree. Double-click a sub-node to display the configuration options for that Frame Sync in the right pane of the DashBoard window.

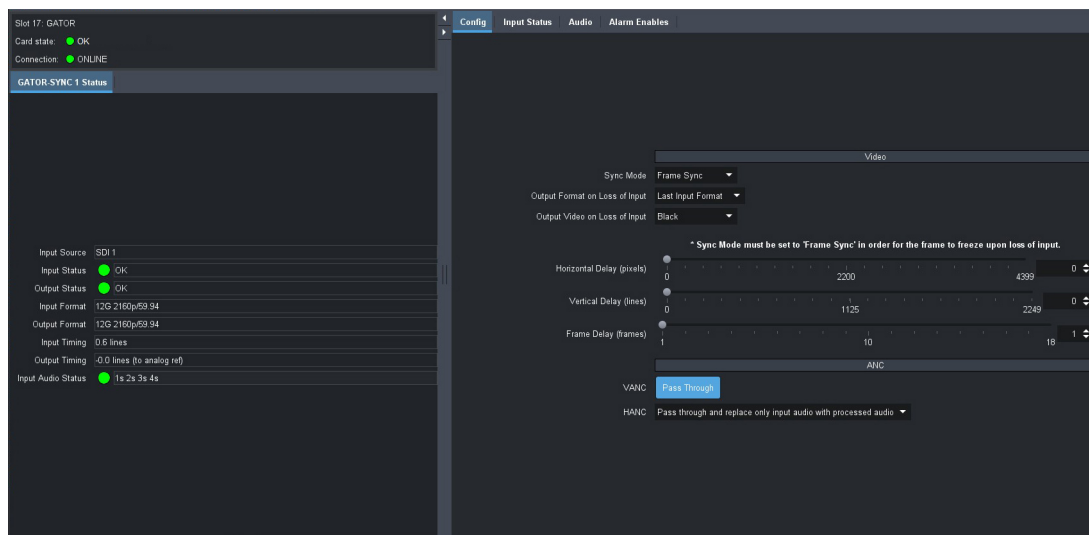


Figure 11 Example of a Frame Sync Interface in DashBoard

GATOR-SYNC Status Tab

Table 13 summarizes the read-only fields displayed in the Status tab for each Frame Sync.

Table 13 GATOR-SYNC # Interface — Status

Item	Parameters	Description
Input Source	SDI #	Indicates the status of the associated SDI IN BNC on the rear module (e.g. SDI IN 1 is monitored for Frame Sync 1)

Table 13 GATOR-SYNC # Interface — Status

Item	Parameters	Description
Input Status	OK (Green)	Indicates that no errors are detected on the video signal of the corresponding SDI IN BNC
	Alarm suppressed (Green)	There is an error on the input source but the Absent alarm is disabled via the Alarm Enables tab
	Ref unlocked (Red)	The input signal on the associated SDI IN BNC is invalid.
	Cal busy (Red)	
	Data unlocked (Red)	
	Align error (Red)	
	TRS error (Red)	
	Frame error (Red)	
	CRC error (Red)	
	Embedded audio error (Red)	The audio channel is invalid or not detected
Output Status	OK (Green)	Indicates that no errors are detected on the video signal of the corresponding SDI OUT BNC
	Cal busy (Red)	The output signal on the associated SDI OUT BNC is invalid
	PLL unlocked (Red)	
	PLL powerdown (Red)	
	Tx not ready (Red)	
Input Format	#	Indicates the input video format
	Invalid Selection	The input video format is not supported or does not match the reference format
Output Format	#	Indicates the output video format
	Invalid Selection	The input video format is not supported or does not match the reference format
Input Timing	Lines: #, Pixels: #	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.
Output Timing	# lines (to x)	Indicates the timing offset between the video output signal and the reference signal where x represents the reference signal specified in the Config > Sync Mode menu
Input Audio Status	#a #x #s #s	Indicates the input audio status where: <ul style="list-style-type: none"> • # represents the audio group (e.g. 1, 2) • a represents an async audio group • x represents a missing audio group • s represents a sync audio

Config Tab

Table 14 summarizes the menus displayed in the Config tab for each Frame Sync.

Table 14 GATOR-SYNC # Interface — Config Tab

Item	Parameters	Description
Video		
Sync Mode	Frame Sync	The Frame Sync uses the reference signal as defined by the Global > Setup > Analog Reference Source menu
	Frame Delay	The Frame Sync uses the corresponding SDI IN signal as the reference source (e.g. SDI IN 1 is the reference source for Frame Sync 1)
Output Format on Loss of Input	Last Input Format	During a loss of input signal, the output video format will be set to the last valid video format
	#	Specifies the output video format during a loss of input signal
Output Video on Loss of Input	Black	Specifies the video output in the event of a loss of video input
	Freeze	Displays the last captured frame of video from the input signal. Ensure that Sync Mode is set to Frame Sync. Note that a valid input signal must be captured in order that the output video is valid.
Horizontal Delay (percent of line)	#	Adjusts the horizontal delay with respect to the selected reference. Refer to Table 4 for a list of values.
Vertical Delay (lines)	#	Specifies the vertical delay with respect to the selected reference. Refer to Table 4 for a list of values.
Frame Delay (frames)	#	Specifies the number of frames of delay with respect to the selected reference. Refer to Table 4 for a list of values.
ANC		
VANC	Pass Through	The data in the VANC passes through to the output without changes; no new AFD packet is inserted when the input signal is valid.
	Delete All	All data in the VANC is deleted; no data is passed through

Table 14 GATOR-SYNC # Interface — Config Tab

Item	Parameters	Description
HANC Pass Through	Pass Through	The data in the HANC passes through to the output without changes
	Delete all HANC data and leave blank	All data in the HANC is deleted; no data is passed through
	Pass through and replace only input audio with processed audio	All HANC data, except the input audio data, is passed through unchanged. The input audio data in the HANC is replaced with the embedded audio configured by the card.
	Delete all HANC data and insert processed audio	All HANC data is deleted. The embedded audio configured by the card is added to the HANC.

Input Status Tab

Table 15 summarizes the read-only information displayed in the Input Status tab for each Frame Sync.

Table 15 GATOR-SYNC # Interface — Input Status Tab

Item	Parameters	Description
Input Status (read-only)	OK (Green)	The input signal is valid and no errors are detected
	Incompatible Video (Yellow)	The input video format is not supported by the selected reference video
	Invalid Video (Red)	The input video format is not supported or does not match the reference format
	No signal (Red)	No signal present on the specified input
Input Format (read-only)	#	Indicates the detected video format of the specified input signal
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
Embedded Audio - Group #		
Ch # Status	PCM	The channel is PCM audio
	Non-PCM	The channel is non-PCM audio
	Absent	The audio channel is not detected or invalid

Audio Tabs

This section summarizes the options displayed in each Audio sub-tab for each Frame Sync.

Audio Control/Shuffle Tab

Table 16 summarizes the options displayed in the Audio Control/Shuffle tab.

Table 16 GATOR-SYNC # Interface — Audio Control/Shuffle Tab

Item	Parameters	Description
Sample Rate Conversion	Selected	Applies the SRC on the audio channels in the video input before processed by the Frame Sync
	Cleared	SRC is not applied to any of the audio channels in the SDI input Select this option when using non-PCM audio data
Group #		
Enable	Enabled	If the button displays this label, the audio group is enabled and applies settings for the selected output
	Disabled	If the button displays this label, the audio group is not included in the output
Ch # Mute	Selected	Mutes the input source for the specified channel that is inserted into the embedded group (if present)
	Cleared	The input source for the specified channel is not muted
Ch # Source	Group # Ch #	Specifies the input for the specified channel that is inserted into the embedded group (if present)
	#kHz Tone	Embeds the selected test tone
Group #	Reset	Resets all Audio Output settings for the applicable audio group to the factory default values

Audio Gain Tab

Table 17 summarizes the options displayed in the Audio Gain tab for each audio group of the Frame Sync.

Table 17 GATOR-SYNC # Interface — Audio Gain Tab

Item	Parameters	Description
Group #		
Ch # Gain (dB)	#	Adjusts the gain of the specified channel of audio Select 0 when using non-PCM audio
Ch # & # Gain Lock	Selected	Locks the Ch Gain slider for the specified channel pair
	Cleared	Unlocks the Ch Gain slider

Audio Delay Tab

Table 18 summarizes the options displayed in the Audio Delay tab for each audio group of the Frame Sync.

Table 18 GATOR-SYNC # Interface — Audio Delay Tab

Item	Parameters	Description
Group #		
Ch # Delay Offset (ms)	#	Adjusts the delay of the specified channel in the audio group
Ch # Total Delay (ms) (read-only)	#	Reports the total delay applied to the specified channel
Ch # & # Delay Lock	Selected	Locks the Ch Delay slider for the specified channel pair
	Cleared	Unlocks the Ch Delay slider

Audio Invert/Sum Tab

Table 19 summarizes the options displayed in the Audio Invert/Sum tab for each audio group of the Frame Sync.

Table 19 Frame Sync # Interface — Audio Invert/Sum Tab

Item	Parameters	Description
Group #		
Ch # Invert	Selected	Inverts the audio signal of the specified group
	Cleared	<ul style="list-style-type: none"> • Audio signal of the specified group is not inverted • Use for non-PCM audio data
Ch # & # Sum	Selected	Both channels will carry the average of the two input channels $((A+B)/2)$
	Cleared	Disables this feature

Alarm Enables Tab

Table 20 summarizes the menus displayed in the Alarm Enables tab.

Table 20 Frame Sync # Interface — Alarm Enables Tab

Item	Parameters	Description
SDI Input		
Absent	Selected*	GATOR-SYNC # Status > Input Status fields report a loss of the specified input or if the format is incompatible for the specified input
	Cleared	Disables this alarm
Audio Input - Group #		

Table 20 Frame Sync # Interface — Alarm Enables Tab

Item	Parameters	Description
Group Absent	Selected*	GATOR-SYNC # Status > Input Audio Status field report when the specified group audio is absent; this alarm only applies to the input
	Cleared	Disables this alarm
Group Async	Selected*	GATOR-SYNC # Status > Input Audio Status fields report when the embedded audio group for the Frame Sync is not compatible
	Cleared	Disables this alarm

Technical Specifications

This chapter provides technical information for GATOR-SYNC.

★ Specifications are subject to change without notice.

Supported Video Formats

Table 21 Technical Specifications — Supported Video Formats

Resolution (lines)	Frame Rate (Hz)
720p	50
	59.94
	60
1080i	50
	59.94
	60
1080p	23.98
	24
	25
	29.97
	30
	50 Level A
	59.94 Level A
	60 Level A
1080psf	23.98
	24
2160p	23.98
	24
	25
	29.97
	30
	50
	59.94
	60

SDI Inputs Specifications

Table 22 Technical Specifications — SDI Inputs

Item	Specifications
Number of Inputs	4
Standards Accommodated	270Mbps, 525/625 Component, SMPTE 259M
	1.485Gbps Component, SMPTE 292M
	2.97Gbps Component, SMPTE 424M
	5.94Gbps Component, SMPTE 2081
	11.88Gbps Component, SMPTE 2082
Impedance	75ohm
Return Loss	>15dB to 1.485Gbps
	>10dB to 2.97Gbps
	>7dB to 5.94Gbps
	>4dB to 11.88Gbps
Equalization (Belden 1694A cable)	>300m (984ft) @ 270Mbps
	>220m (722ft) @ 1.485Gbps
	>140m (459ft) @ 2.97Gbps
	>50m (190ft) @ 11.88Gbps
Connection	HD-BNC

SDI Outputs Specifications

Table 23 Technical Specifications — SDI Outputs

Item	Specifications
Number of Outputs	4
Impedance	75ohm
Return Loss	>15dB to 1.485Gbps
	>10dB to 2.97Gbps
	>7dB to 5.94Gbps
	>4dB to 11.88Gbps
Signal Level	800mV \pm 10%
DC Offset	0V \pm 50mV
Rise and Fall Time (20-80%)	270Mbps: 0.4-1.5nS, <0.5nS difference
	1.485Gbps: <270ps, <100ps difference
	2.97Gbps: <135ps, <50ps difference
	5.94Gbps: <80ps, <30ps difference
	11.88Gbps: <45ps, <18ps difference

Table 23 Technical Specifications — SDI Outputs

Item	Specifications
Jitter	270Mbps: <0.2UI, jitter measured 10Hz-1kHz
	1.485Gbps: <1.0UI jitter measured 10Hz-100kHz, <0.2UI above 100kHz
	2.97Gbps: <1.0UI jitter measured 10Hz-100kHz, <0.3UI above 100kHz
	5.94Gbps: <2.0UI jitter measured 10Hz-100kHz, <0.3UI above 100kHz, band limit @594MHz
	11.88Gbps: <2.0UI jitter measured 10Hz-100kHz, <0.3UI above 100kHz, band limit @1188MHz
Overshoot	<10% (11.88Gbps: <15%)
Connection	HD-BNC

Environment

Table 24 Technical Specifications — Environment

Item	Specifications
Maximum Ambient Temperature	40°C (104°F)

Power

Table 25 Technical Specifications — Power

Item	Specifications
Maximum Power Consumption	40W-80W (application dependent)

Service Information

Routine maintenance to this openGear 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.
 - The **OK/ERROR** LED flashes green while the card is waiting for a new software load.
 - 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-SYNC 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.

Should you find that this card has failed after your warranty period has expired, we will repair your defective product should suitable replacement components be available. You, the owner, will bear any labor and/or part costs incurred in the repair or refurbishment of said equipment beyond the FIVE (5) year warranty period.

In no event shall Ross Video Limited be liable for direct, indirect, special, incidental, or consequential damages (including loss of profits) incurred by the use of this product. Implied warranties are expressly limited to the duration of this warranty.

This User Manual provides all pertinent information for the safe installation and operation of your openGear product. Ross Video policy dictates that all repairs to the card are to be conducted only by an authorized Ross Video Limited factory representative. Therefore, any unauthorized attempt to repair this product, by anyone other than an authorized Ross Video Limited factory representative, will automatically void the warranty. Please contact Ross Video Technical Support for more information.

In Case of Problems

Should any problem arise with your card, please contact the Ross Video Technical Support Department. (Contact information is supplied at the end of this publication.)

A Return Material Authorization number (RMA) will be issued to you, as well as specific shipping instructions, should you wish our factory to repair your card. If required, a temporary replacement frame will be made available at a nominal charge. Any shipping costs incurred will be the responsibility of you, the customer. All products shipped to you from Ross Video Limited will be shipped collect.

The Ross Video Technical Support Department will continue to provide advice on any product manufactured by Ross Video Limited, beyond the warranty period without charge, for the life of the equipment.

Software Licenses

This chapter provides third-party software license information for your GATOR-SYNC. This product includes multiple software components which are individually licensed under one or more of the following licenses included in this chapter.

BSD

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LGPL

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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](ftp://ds.internic.net/rfc/rfc1951.txt) (deflate format) and [rfc1952.txt](ftp://ds.internic.net/rfc/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.

CDN — content distribution network.

DashBoard — the DashBoard Control System.

DF — Differentiated Services.

DTVCC captions — CEA-708 captions.

Frame — the openGear frame that houses the GATOR-SYNC.

HLS — HTTP Live streaming.

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.

openGear frame — refers to the OG3-FR series and OGX-FR series frames unless otherwise noted.

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

PCR — program clock reference.

PID — packet identifier.

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.

RTMP — Real Time Messaging Protocol.

Stream — a transport stream present at the port.

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

TCP — Transmission Control Protocol.

TOS — Type of Service.

TPG — Test Packet Generator.

TTL — Time To Live.

UDP — User Datagram Protocol.

User — the person who uses the GATOR-SYNC.

