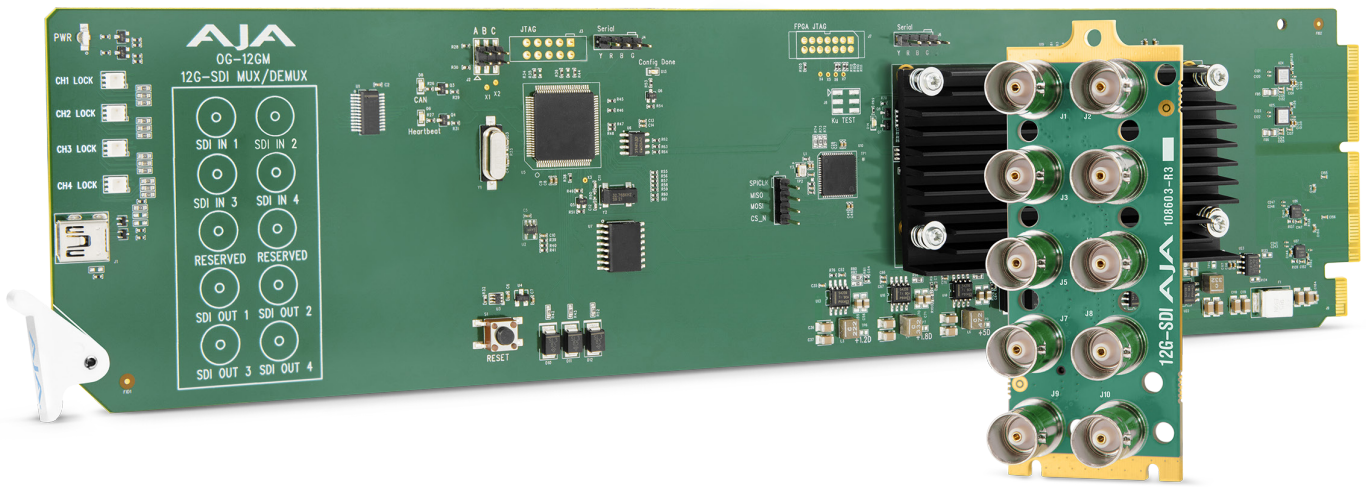


# OG-12GM

## 12G-SDI MUX/DEMUX

### openGear Card



## Installation and Operation Guide

Version 1.0.2r1  
Published January 7, 2021



# Notices

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## Contacting AJA Support

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When calling for support, have all information at hand prior to calling. To contact AJA for sales or support, use any of the following methods:

Telephone	+1.530.271.3190
FAX	+1.530.271.3140
Web	<a href="https://www.aja.com">https://www.aja.com</a>
Support Email	<a href="mailto:support@aja.com">support@aja.com</a>
Sales Email	<a href="mailto:sales@aja.com">sales@aja.com</a>

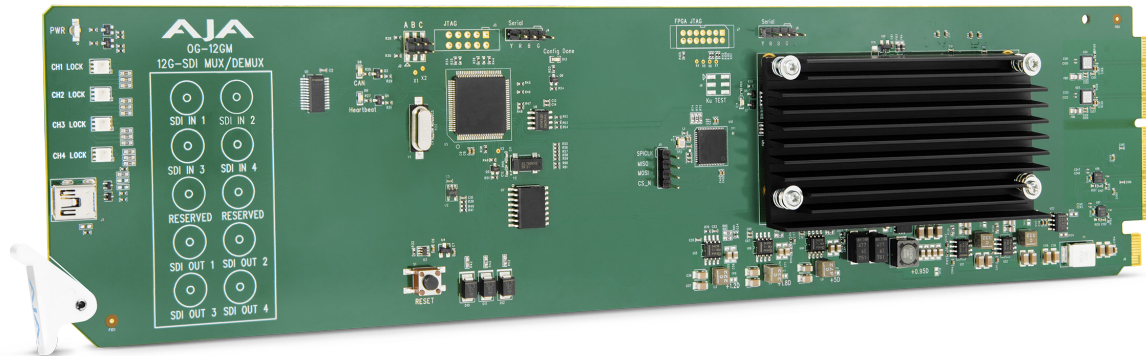
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# Chapter 1 – Introduction

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## Card Overview

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The OG-12GM is a compact SDI transport openGear converter card that can solve a wide range of UltraHD/4K equipment inter-connection problems. The product will convert quad-link SDI signals to single-link SDI (Mux function) as well as single-link SDI to quad-link SDI (Demux function).

The OG-12GM supports Two Sample Interleave (2SI) to Square Division (Quadrant) and Square Division (Quadrant) to Two Sample Interleave (2SI) pixel mapping. The OG-12GM also supports 3G-SDI Level A and Level B-DL.

The OG-12GM is configured using DashBoard by Ross Video, which also provides detailed input and output signal diagnostic information.

## Features

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- openGear compatible card
- Single 12G-SDI to/from Quad 3G-SDI Level A
- Single 12G-SDI to/from Quad 3G-SDI Level B-DL
- Single 6G-SDI to/from Quad 1.5G-SDI
- Quad 3G-SDI Level A to/from Quad 3G-SDI Level B-DL
- Two Sample Interleave (2SI) to/from Square Division (Quadrant) pixel mapping, 3G
- Pass through of Single Link 3G, 1.5G and 270M SDI video
- Distribution Amplifier support (1x4)
- Input signal diagnostics and timing analyzer for quad-link signals
- Automatic or manual control
- Detailed timing analysis for validating alignment of quad-link SDI inputs
- Passes SDI embedded audio, 24-bit, up to 16-Channels
- Recognizes and transmits High Dynamic Range (HDR) and Wide Color Gamut (WCG) signaling on VPID
- Power: 12 watts
- Hot-swappable
- Remote Ethernet configuration through Ross DashBoard software
- Rear I/O card included

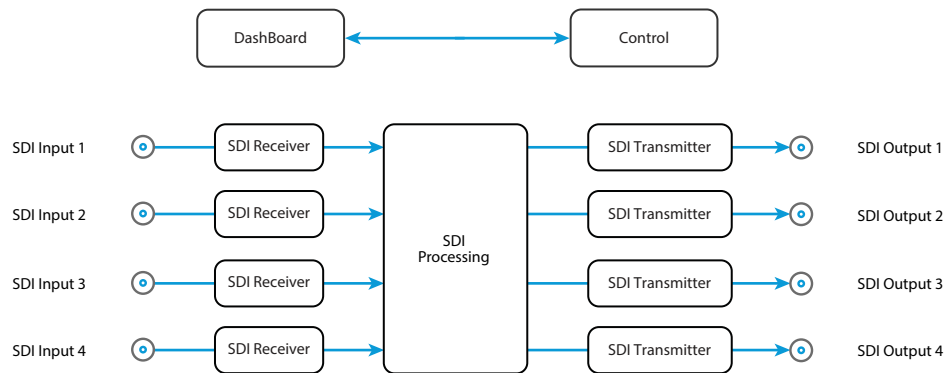
- Two slots required for each card
- Compatible with OG-X-FR, OG-3-FR, and DFR-8321 openGear frames
- Five-year warranty

## DashBoard for openGear

DashBoard by Ross Video is used to work with openGear cards and frames. Use DashBoard as part of the configuration process of OG-12GM during setup of the system integration.

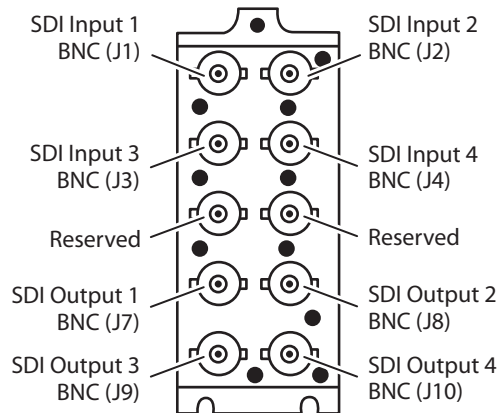
## OG-12GM Simplified Block Diagram

Figure 1. OG-12GM Block Diagram



## I/O Connections for OG-12GM

Figure 2. Rear View of OG-12GM Card Connectors



## LED Indicators

LEDs on the front (near door) of the card indicate the presence of power and the type of signal detected on the SDI inputs as follows (from top to bottom):

### Power LED

The Power LED indicates the state of the card as displayed in DashBoard. When power is present, it can be green, yellow or red.

- Green: no DashBoard card state alarm is present.
- Yellow: a yellow DashBoard card state alarm is present. See DashBoard for more information.

- Red: a red DashBoard card state alarm is present. See DashBoard for more information.

### CH1 LOCK, CH2 LOCK, CH3 LOCK, CH4 LOCK

The LEDs adjacent to each SDI channel label indicate by color the detected signal type:

- Off: no signal
- Green: SD
- Red: HD
- Amber: 3G
- Purple: 6G
- Blue: 12G

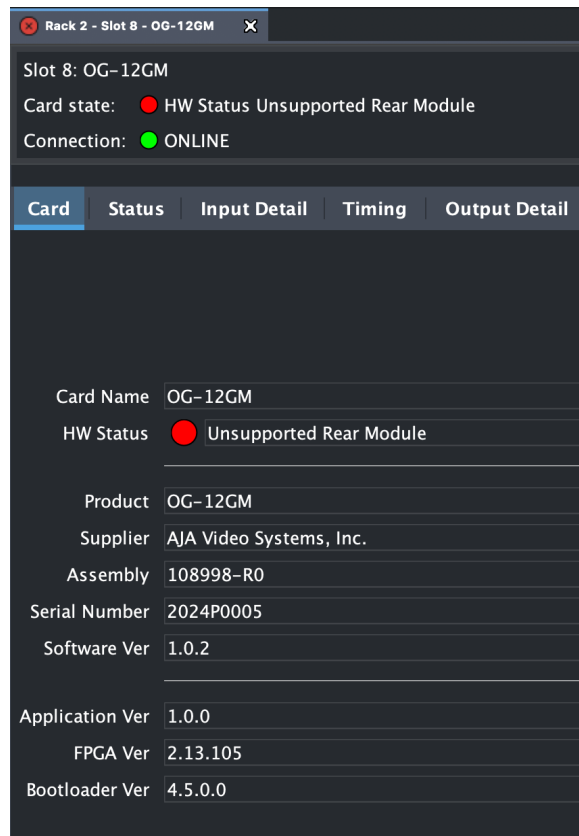
## Signal Indicators in the DashBoard Control System

### Card Alarm State – Red

When the card is connected to an incompatible rear card, it will result in a red alarm indicator:

- HW Status Unsupported Rear Module

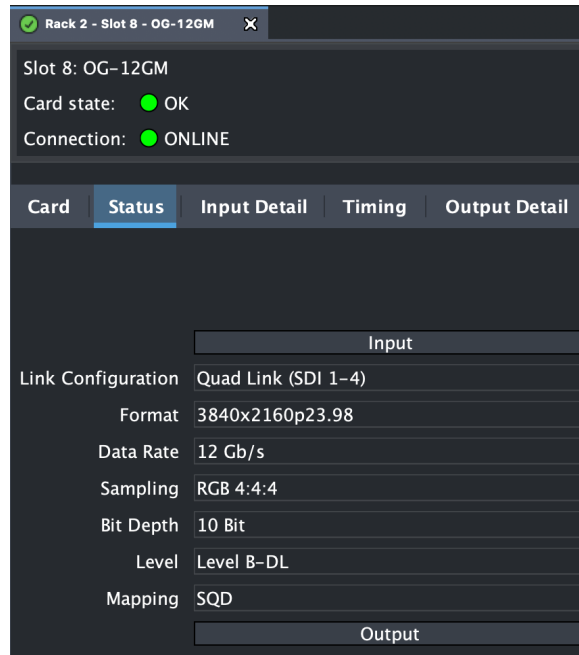
*Figure 3. Card alarm state red*



### Card Alarm State – Green

When there is a valid input signal detected, the DashBoard Control System shows a green Card State.

Figure 4. Signal is present and locked



## User Controls

The essential user controls for the OG-12GM consist of two components—an openGear 2RU frame, and the DashBoard Control System.

### openGear and AJA

openGear is an open-architecture, modular frame system designed by Ross Video and supported by a diverse range of terminal equipment manufacturers, including AJA. Ross Video manufactures the frames, power supplies and network cards for openGear. AJA is a reseller of the openGear frames.

AJA Video is a leading manufacturer of video interface technologies, converters, digital video recording solutions and professional cameras, bringing high-quality, cost-effective products to the professional, broadcast and post-production markets. AJA products, including openGear cards, are designed and manufactured at our facilities in Grass Valley, California.

### DashBoard Control System

The DashBoard Control System, created by Ross Video, provides a control interface between Windows, macOS and Linux computers and the cards installed in an openGear frame. DashBoard operates through TCP/IP communication and requires an Ethernet connection between the controlling computer and an openGear frame.

Use DashBoard to select the Mux/Demux link configuration settings.

For details about acquiring and using the DashBoard Control System, refer to ["Using the DashBoard Control System" on page 12.](#)

# Installation

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## Summary

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**NOTE:** Use with openGear OG-3-FR and OG-X-FR 2RU frames. DFR-8321 frame is not supported.

Installing an OG-12GM card into an OG-X-FR openGear frame consists of the following steps:

- Install the Rear Panel onto the back of the frame corresponding to the slot pair you will be using for the OG-12GM card.
- Insert the OG-12GM card into the frame in the right (even numbered) slot of the pair.
- Connect the BNC cabling to the Rear Panel.



**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 wearing synthetic fiber clothing. Always exercise proper grounding precautions when working on circuit boards and related equipment.

## Unpacking

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Unpack each openGear product you received from the shipping container and ensure that all items are included. If any items are missing or damaged, contact your sales representative or AJA directly.

## Parts List

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Quantity	Description
1	OG-12GM Front Card in ESD bag
1	12G 10 BNC Rear Card

## Rear OG-12GM Card Installation

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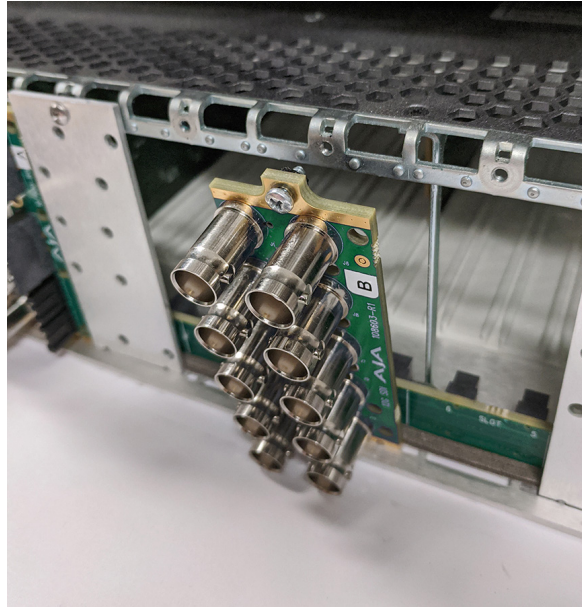
1. Ensure that the frame is properly installed.
2. Locate the card frame slot on the rear of the openGear frame into which you wish to install the openGear card.

**NOTE:** An OG-12GM card occupies two slots in the frame.

3. Using a Phillips screwdriver, unscrew the top screw from the desired blank rear plate and remove the rear plate.
4. Seat the bottom of the Rear Card in the seating slot at the base of the frame back plane.

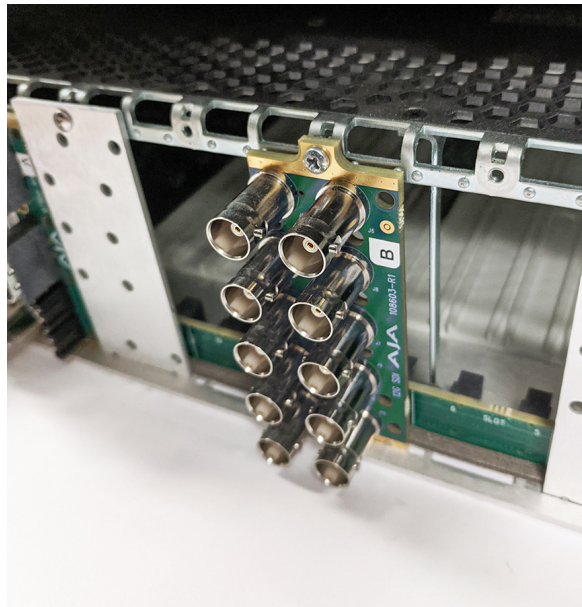


*Figure 5. Rear Card Inserting Into Frame Seating Slot*



5. Align the top screw of the Rear Card with the screw hole on the top edge of the frame back plane.
6. Ensure the Rear Card aligns with the desired card slot before tightening the screw.
7. Using a Phillips screwdriver, fasten the Rear Card to the frame back plane. Do not over tighten.

*Figure 6. Rear Card Inserted Into Frame Seating Slot*



8. Ensure proper frame cooling and ventilation by having all rear frame slots covered with rear modules or blank metal plates if plates are not pre-installed.

## Front OG-12GM Card Installation

1. Open the openGear frame door as follows:

- A. Gently pull the side door tabs towards the center of the door, releasing the door from the frame.
- B. Using both hands, pull the door towards you. The door extender arms prevent the door from falling.
2. Locate the Rear Card you installed as described above. The interior slot number is dependent on the slot combinations into which you installed the Rear Card. This allows adequate spacing to avoid damaging the card, the cards installed in the neighboring slots, or both.
3. Hold the card by the edges and carefully align the card edges with the rails inside the frame. The slots are numbered starting from the left-most slot when facing the frame front.

*IMPORTANT: OG-12GM cards are installed into the right (even numbered) slot of the pair in order to connect with the rear panel.*

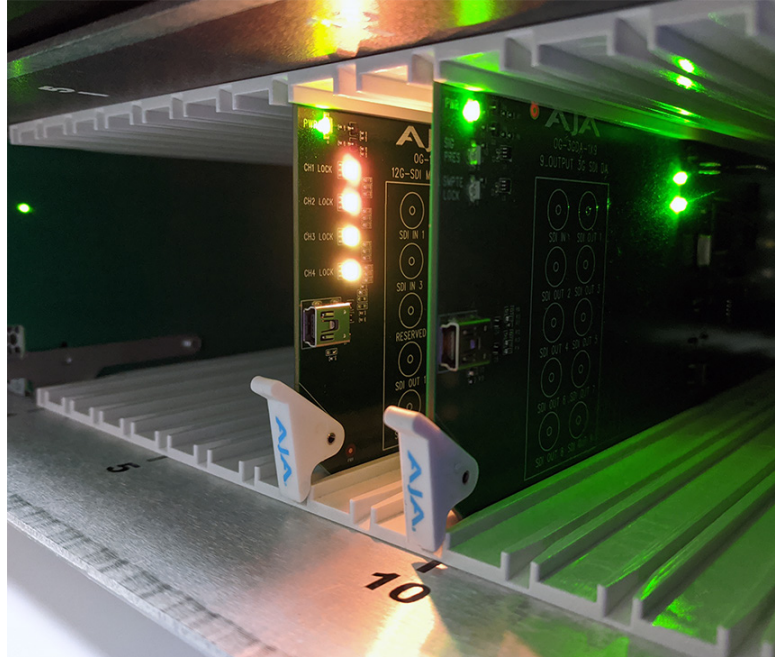
4. Fully insert the card into the frame until the card is properly seated in the Rear Card. There are two stages to inserting the card:
  - A. After you feel the card's first click, its position in the frame will resemble the photograph below in [Figure 7](#).
  - B. Next, press against the white plastic tab again until you feel the second click. The card's position will resemble the photograph below in [Figure 8](#).

*NOTE: Some cards require more pressure than others to be fully inserted. Make sure that the plastic tab at the bottom of the front edge of the card is completely upright. If it is tilting forward, the card is not yet fully inserted.*

*Figure 7. The card on the right is already fully inserted. The card on the left is not yet fully inserted, as indicated by the white plastic tab tilting forward.*



Figure 8. The white plastic tab for the card on the left is now upright. Both cards are shown fully inserted.



5. Close the frame door as follows:
  - A. Slide the door into the frame.
  - B. Pull and release the door tabs to ensure the frame door is securely locked to the frame.

## Cabling

Refer to [Figure 2 on page 5](#) to identify the input and output signal connectors.

# Chapter 2 – Operation

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## Using the DashBoard Control System

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The DashBoard Control System is available as a free download from the openGear DashBoard Software Download webpage:

<https://www.rossvideo.com/support/software-downloads/dashboard/>

Ross Video offers comprehensive documentation that covers the extensive capabilities of the DashBoard Control System:

<https://www.rossvideo.com/support/product-documentation/dashboard/>

This AJA OG-12GM manual addresses only those essential aspects of the DashBoard Control System needed to control the OG-12GM card.

## Requirements

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Use the latest available version of DashBoard.

The DashBoard Control System requires the following components:

- openGear frame with a Frame Controller card
- Ethernet connection between the controlling computer and the openGear frame

*NOTE: The openGear frame ships from AJA with the MFC-8322-S Frame Controller card for controlling the new AJA DashBoard cards. The openGear frame also supports the MFC-OG3-N Advanced Networking Frame Controller card, which can be used to control compatible OG cards.*

DashBoard automatically discovers openGear and DashBoard Connect devices, such as openGear frames and cards that are present and accessible on your network.

## Configuration Settings Stored in OG Card

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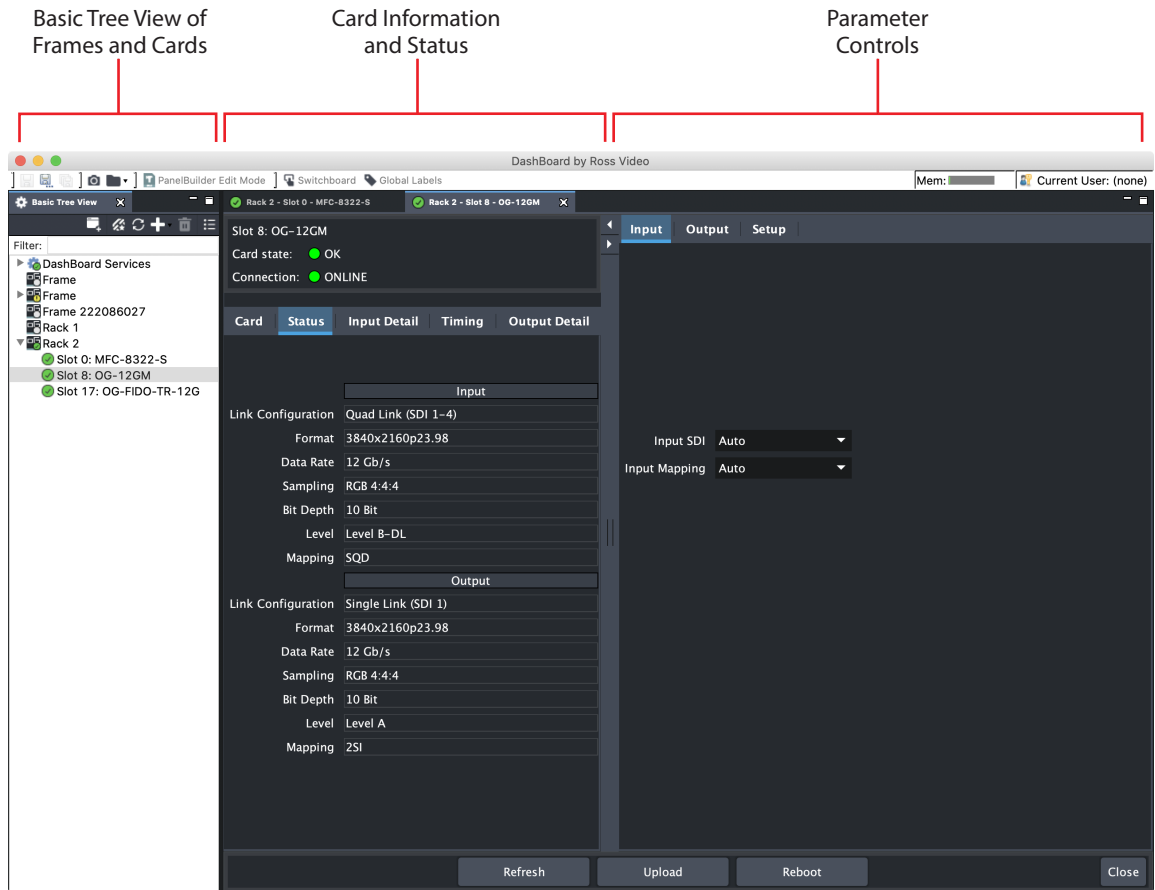
Configuration settings made through DashBoard are stored in the OG-12GM unit through subsequent power cycles.

## DashBoard Control Interface Basic Components

---

The basic components of the DashBoard Control System user interface consist of the basic tree view of frames and cards, the card information and status panel, and the parameter controls panel. These elements are shown below.

Figure 9. Main Sections of the DashBoard User Interface



## Basic Tree View of Frames and Cards

The basic tree view in the left column shows the frames and cards that are discoverable by DashBoard on your network.

## Card Information and Status

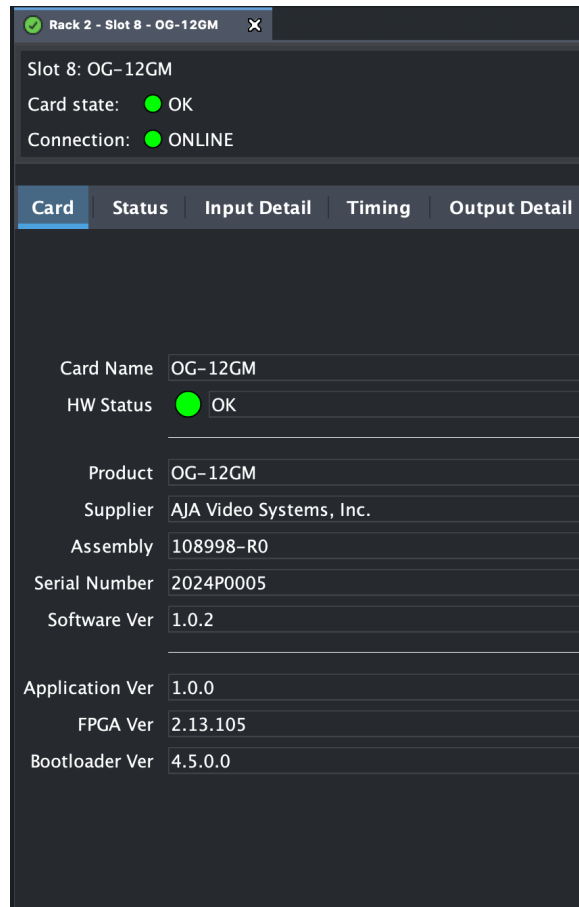
The card information and status panel, shown in the middle panel, display the basic status of the card currently selected in DashBoard.

## Parameter Controls

The parameter controls panel on the right side of DashBoard shows the tabs and parameters that are configurable for the selected card. The white fields indicate that they can be written to, or modified.

## Card Tab Screen

Figure 10. OG-12GM Card Tab Screen in Dashboard



The Card tab screen indicates the basic information about the card itself such as the card name, hardware status, serial number, software version and other items.

## Status Tab Screen

The Status tab screen indicates the status of key aspects of Input and Output signal presence such as Link Configuration, Format, Data Rate, Sampling, Bit Depth, Level, and Mapping.

Figure 11. OG-12GM Status Tab Screen in DashBoard reflecting Single 12G-SDI to Quad 3G-SDI conversion.

Rack 2 - Slot 8 - OG-12GM X

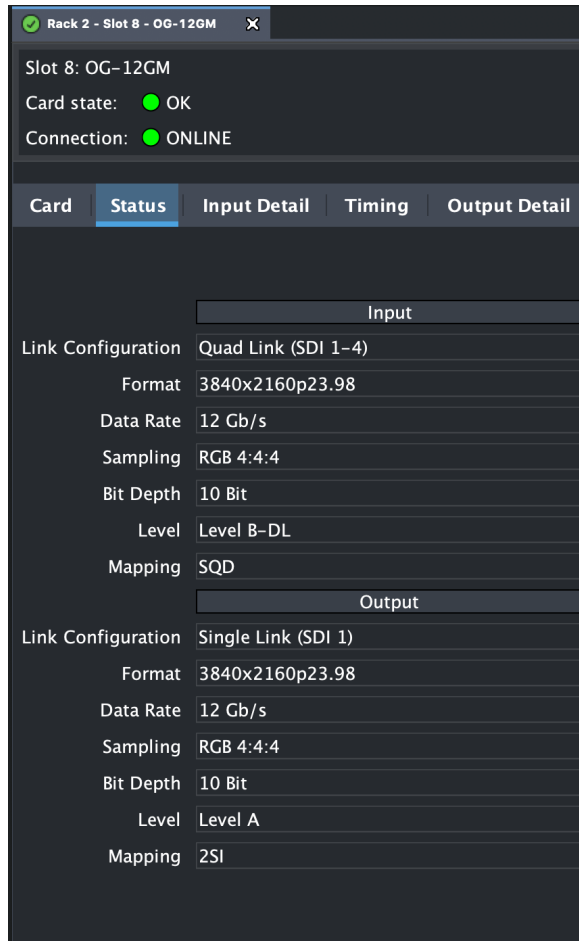
Slot 8: OG-12GM  
Card state: ● OK  
Connection: ● ONLINE

Card | **Status** | Input Detail | Timing | Output Detail

Input	
Link Configuration	Single Link (SDI 1)
Format	3840x2160p23.98
Data Rate	12 Gb/s
Sampling	RGB 4:4:4
Bit Depth	10 Bit
Level	Level A
Mapping	2SI

Output	
Link Configuration	Quad Link (SDI 1-4)
Format	3840x2160p23.98
Data Rate	3 Gb/s
Sampling	RGB 4:4:4
Bit Depth	10 Bit
Level	Level A
Mapping	-----

Figure 12. OG-12GM Status Tab Screen in DashBoard reflecting Quad 3G-SDI to Single 12G-SDI conversion using Square Division (Quadrant) to Two Sample Interleave (2SI) pixel mapping





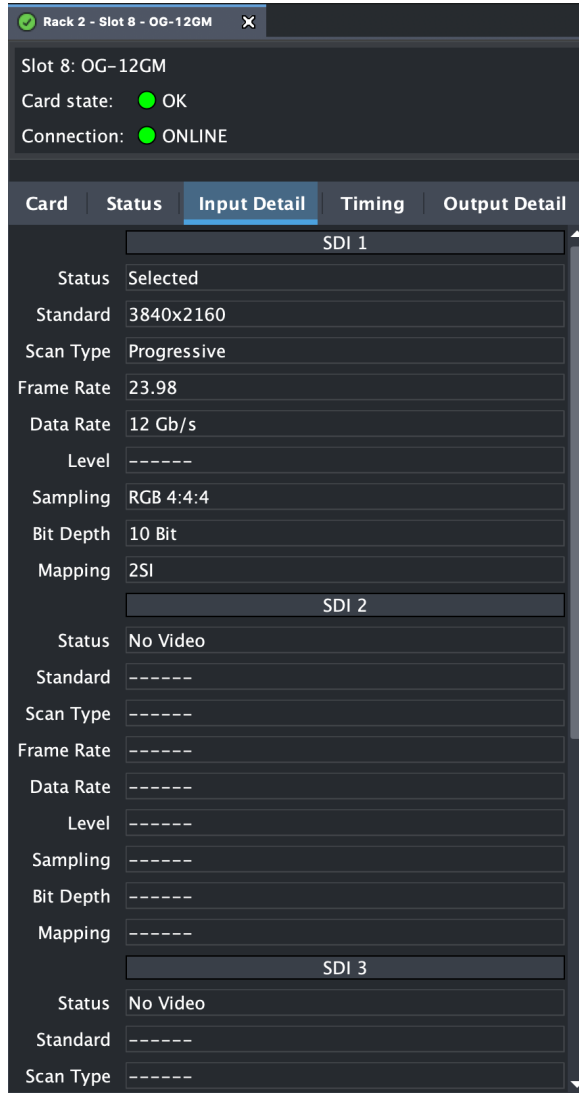
## Input Detail Tab Screen

Click on the Input Detail tab to view detailed input signal diagnostic information. This can be useful for trouble-shooting and debugging. Input details detected include Status, Standard, Scan Type, Frame Rate, Data Rate, Level, Sampling, Bit Depth, and Mapping for each input BNC.

*Figure 13. Example of Input Detail Tab Screen in DashBoard reflecting Quad 3G-SDI to Single 12G-SDI conversion using Square Division (Quadrant) to Two Sample Interleave (2SI) pixel mapping.*



Figure 14. Example of Input Detail Tab Screen reflecting Single 12G-SDI Input.



## Timing Tab Screen

Figure 15. Example of the OG-12GM Timing Tab Screen in DashBoard with Quad 3G-SDI to Single 12G-SDI conversion using Square Division (Quadrant) to Two Sample Interleave (2SI) pixel mapping.

Card	Status	Input Detail	Timing	Output Detail
Slot 8: OG-12GM				
Card state: <span style="color: green;">●</span> OK				
Connection: <span style="color: green;">●</span> ONLINE				
SDI 1				
Alignment Status				
Lines		0		
Pixels		0		
Pixel Time		0.000us		
Total		0.000us		
SDI 2				
Alignment Status		Advanced		
Lines		-3050		
Pixels		-1107		
Pixel Time		-7.455us		
Total		-56488.879us		
SDI 3				
Alignment Status		Advanced		
Lines		-3050		
Pixels		-1107		
Pixel Time		-7.455us		
Total		-56488.879us		
SDI 4				
Alignment Status		Delayed		
Lines		+0		
Pixels		+1		
Pixel Time		+0.007us		
Total		+0.007us		

The purpose of the Timing Tab Screen is to validate that all four links of a Quad Link input signal meet the required 400ns link-to-link timing, and if not, which link(s) are not meeting this specification.

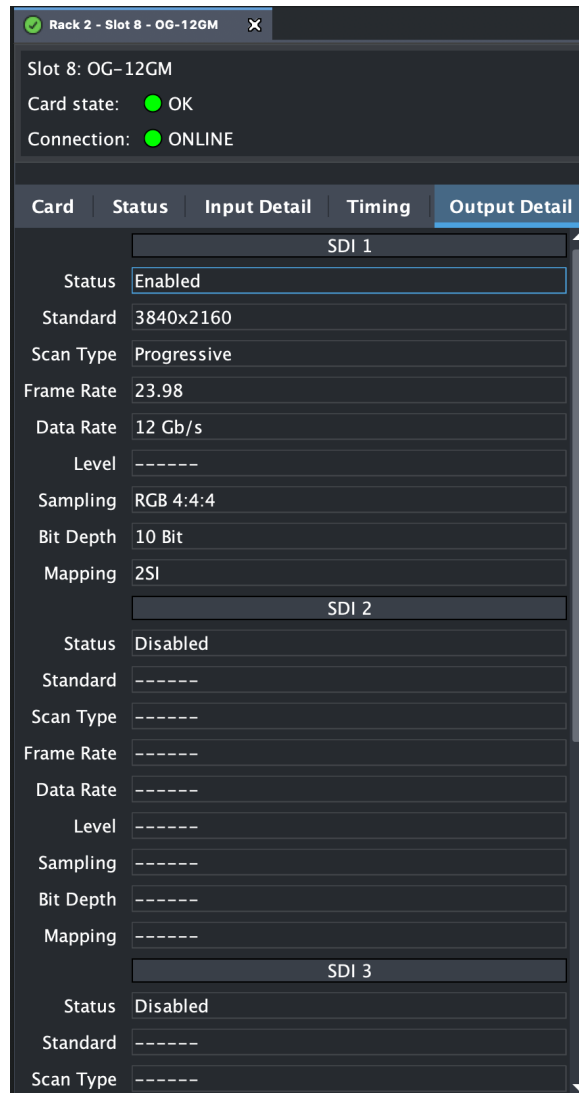
The Timing Tab Screen measures timing differences link to link, but displays timing values relative to SDI 1 for ease of understanding and correcting timing issues. The Timing analyzer has a measurement range of +/- 1/2 frame.

The Pixels row indicates any horizontal offset in terms of pixels for each link, while the Pixels Time information indicates the horizontal offset in terms of microseconds. These two rows display the same information represented in different terms (pixels versus microseconds). The pixel information (pixels and pixel time) indicates offset of up to 1 line. If the offset exceeds 1 line, then the line count is incremented.

The Total row displays each link's total offset (vertical timing plus horizontal offset) in terms of time.

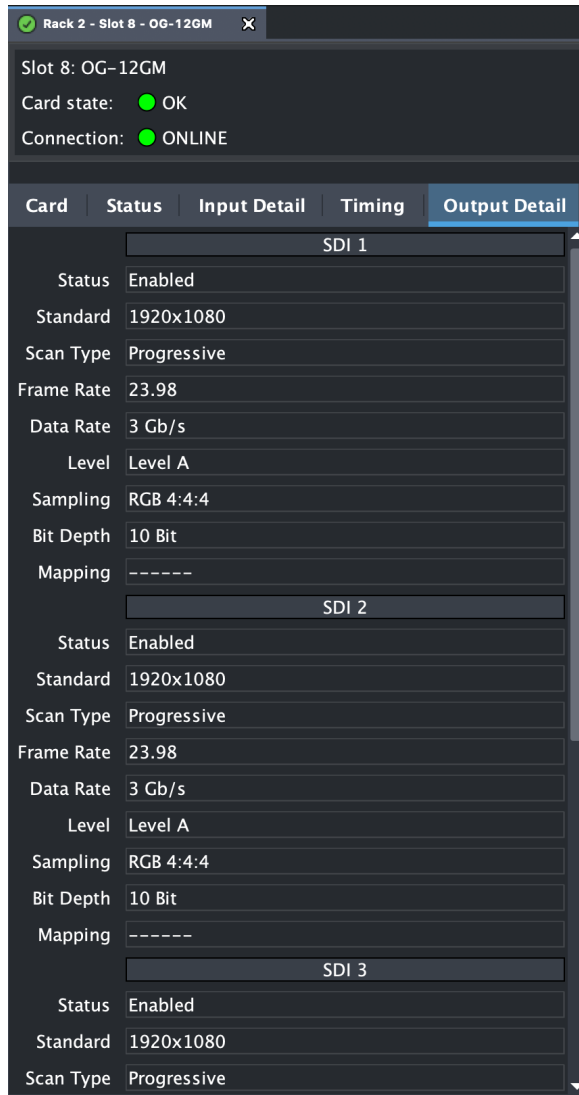
## Output Detail Tab Screen

Figure 16. Example of OG-12GM Output Detail Tab Screen in Dashboard using Quad 3G-SDI to Single 12G-SDI conversion using Square Division (Quadrant) to Two Sample Interleave (2SI) pixel mapping.



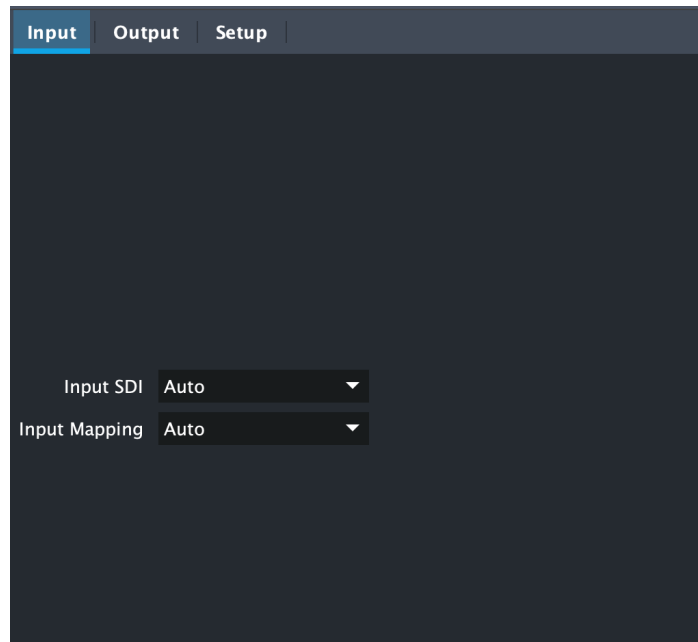
Click on the Output Detail tab to view detailed output signal diagnostic information. This can be useful for trouble-shooting and debugging. Output signal details include Status, Standard, Scan Type, Frame Rate, Data Rate, Level, Sampling, Bit Depth, and Mapping for each output BNC.

Figure 17. Example of OG-12GM Output Detail Tab Screen in Dashboard reflecting Single 12G-SDI to Quad 3G-SDI conversion with Square Division (Quadrant) to Two Sample Interleave (2SI) pixel mapping.



## Input Tab Screen

Figure 18. OG-12GM Input Tab Screen in DashBoard



Click on the Input tab to view and make changes to the converter's input settings.

### Input SDI

Selects the input link configuration. Choose from the following:

**Auto** - Automatically selects the link configuration based on the detected input video parameters. To the right of the drop-down menu, the status display reflects the current Input SDI behavior.

In order for "Auto" to select Quad Link (SDI 1-4), all four inputs must match in terms of data rate, link mapping, raster, frame rate, scan type, sampling, bit depth, and pixel mapping.

**Single Link (SDI 1)** - Select this option if you have a Single Link UltraHD/4K signal coming in through SDI In 1.

**Single Link (SDI 2)** - Select this option if you have a Single Link UltraHD/4K signal coming in through SDI In 2.

**Single Link (SDI 3)** - Select this option if you have a Single Link UltraHD/4K signal coming in through SDI In 3.

**Single Link (SDI 4)** - Select this option if you have a Single Link UltraHD/4K signal coming in through SDI In 4.

**Quad Link (SDI 1-4)** - Select this option if you have a Quad Link UltraHD/4K signal coming in through SDI In 1-4.

### Input Mapping

**NOTE:** *Input pixel mapping applies only to 4K/UltraHD signals being transported on Quad Link 4 x 3G inputs, as 6G and 12G SDI are always Two Sample Interleave (2SI), and Quad Link 1.5G SDI is always Square Division (Quadrant).*

For 4K/UltraHD signals using Quad Link 3Gbps transport, the Video Payload Identifier (VPID) embedded in each link indicates whether the pixel mapping is 2SI or not. If 2SI is not indicated, the OG-12GM assumes that the input signal is mapped Square Division (Quadrant). Note that there are no specific VPID bits to indicate Square Division (Quadrant).

Use the Input Mapping control to select the input mapping. Choose from the following:

**Auto** - Analyzes details of each input. The VPID from each input signal indicates whether its pixel mapping is Two Sample Interleave (2SI) or Square Division (Quadrant).

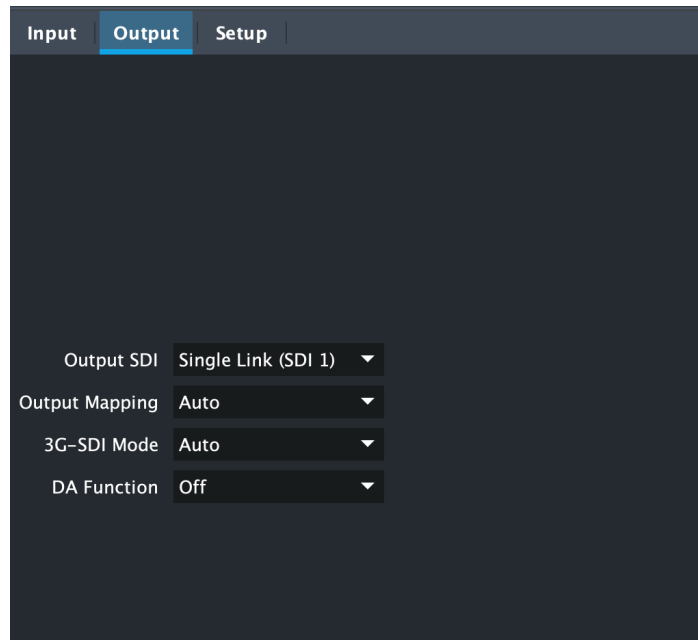
In order for "Auto" to select 2SI pixel mapping, the video input (whether single link 6G-SDI or 12G-SDI, or Quad Link 3G-SDI) must indicate 2SI with its embedded VPID(s).

**2SI** - Select this option if you are inputting a Two Sample Interleave (2SI) pixel mapped signal.

**SQD** - Select this option if you are inputting a Square Division (Quadrant) pixel mapped signal.

## Output Tab Screen

*Figure 19. Example of the OG-12GM Output Tab Screen in DashBoard showing Quad 3G-SDI to Single 12G-SDI conversion using Square Division (Quadrant) to Two Sample Interleave (2SI) pixel mapping.*



Click on the Output tab to view and make changes to the converter's output settings.

### Output SDI

**Auto** - Automatically selects the output link configuration based on the inputs detected.

If Quad Link UltraHD/4K (SDI 1-4) is detected on the input, the output will auto-select to a Single Link (SDI 1) multiplex output.

If Single Link UltraHD/4K (SDI 1) is detected on the input, the output will auto-select to a Quad Link (SDI 1-4) to demux the signal to four outputs using SDI Outputs 1-4.

**Single Link (SDI 1)** - Causes the OG-12GM to use only SDI Output 1. The combination of input and output settings determines whether the OG-12GM is muxing, demuxing or passing through.

**Quad Link (SDI 1-4)** - Causes the OG-12GM to use SDI Outputs 1-4, if possible. The combination of input and output settings determines whether the OG-12GM is muxing, demuxing or passing through.

### Output Mapping

---

**NOTE:** *Output pixel mapping applies only to 4K/UltraHD signals being transported on Quad Link 4x 3G outputs. 6G and 12G SDI are always Two Sample Interleave (2SI), and Quad Link 1.5G SDI is always Square Division (Quadrant).*

Selects the output mapping for Quad Link 4x 3G outputs. Choose from the following:

**Auto** - Automatically selects the output pixel mapping based on the input pixel mapping detected.

If Quad Link UltraHD/4K (SDI 1-4) 2SI is detected on the input, the output pixel mapping will be SQD.

If Quad Link UltraHD/4K (SDI 1-4) SQD is detected on the input, the output pixel mapping will be 2SI.

If Quad Link UltraHD/4K (SDI 1-4) SQD or 2SI 3G is detected on the input, the output pixel mapping will be 12G 2SI.

If Single Link UltraHD/4K (SDI 1-4) 12G is detected on the input, the output pixel mapping will be Quad 3G 2SI.

**2SI** - Causes the OG-12GM to output a Two Sample Interleave (2SI) pixel mapped signal.

**SQD** - Causes the OG-12GM to output a Square Division (Quadrant) pixel mapped signal.

### 3G-SDI Mode

---

The OG-12GM's 3G-SDI Mode offers the choice between Auto, Level A and Level B-DL.

**Auto** - The OG-12GM will automatically select Level A or Level B-DL based on the inputs detected.

- For Single Link 12G input, Auto will select 4x 3G Level A for the output.
- For a Single Link 6G input, Auto will select 4x 1.5G for the output.
- For a Single Link 3G Level A input, Auto will select 2x 3G Level B-DL for the output.

**Level A** - The SDI Outputs will carry a 3G-SDI Level A signal to support these configurations:

- 4x 3G-SDI Level B-DL to 4x 3G-SDI Level A
- 1.5G-SDI to 3G-SDI Level A

**Level B-DL** - The SDI Outputs will carry a 3G-SDI Level B-DL signal to support these configurations:

- 12G-SDI to 4x 3G-SDI Level B-DL
- 4x 3G-SDI Level A to 4x 3G-SDI Level B-DL
- 3G-SDI Level A to 1.5G-SDI

### DA Function

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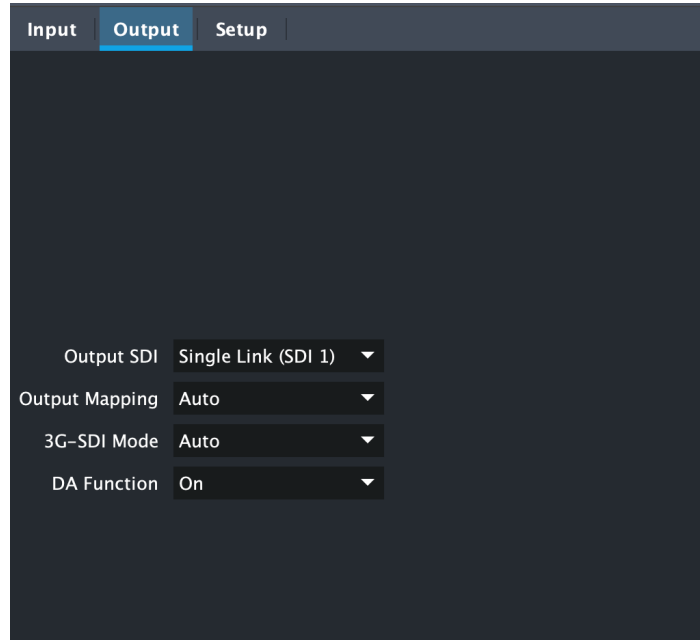
The OG-12GM's Distribution Amplifier (DA) function is available for Single Link output signals.

**On** - When turned on, the DA function will duplicate SDI Output 1's signal on SDI Outputs 2, 3, and 4.

**NOTE:** *If the output is a Quad Link signal, the DA function is overridden and turned off.*

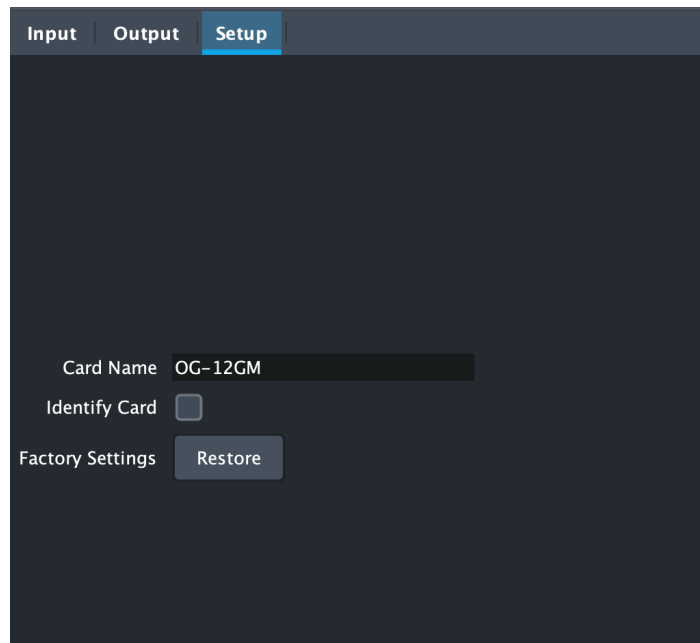


**Off** - When turned off, no signal duplication will occur.



## Setup Tab Screen

Figure 20. OG-12GM Setup Tab Screen in Dashboard



Click on the Setup tab to view and make changes to the card name, to identify the card in the openGear frame, or to restore card settings to factory default values.

**Card Name** - By default, this field is pre-populated with the card name OG-12GM. You can change the card name by editing the text in the Card Name field.

*NOTE:* Changing the Card Name in the Setup tab also changes the name of the card in the Dashboard tree view.

**Identify Card** - Select the checkbox to turn on the Identify Card function. When this function is turned on, an LED light on the front of the OG-12GM card inside the openGear frame will blink to help you quickly identify the card. Open the front of the openGear frame in order to see the light blinking.

**Factory Settings** - If you would like to revert the card settings to factory default values, click **Restore**. A confirmation prompt displays. Select "Yes" to restore factory settings. Select "No" to cancel.

## Uploading New Software

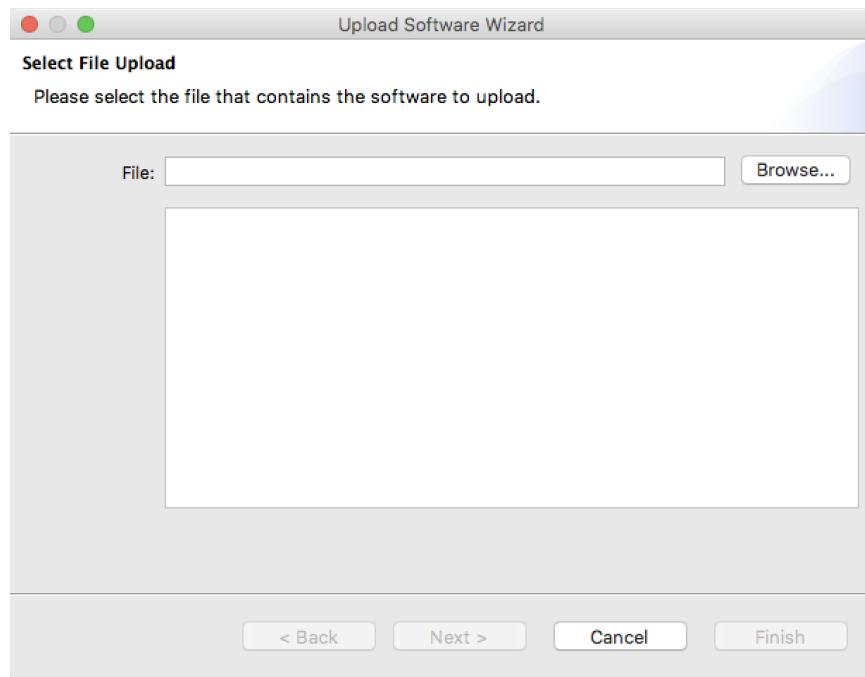
Application software uploaded through DashBoard are .bin files.

To Upload New Software

When available, you can upload updated software to the OG-12GM through the DashBoard Control System by following the steps below.

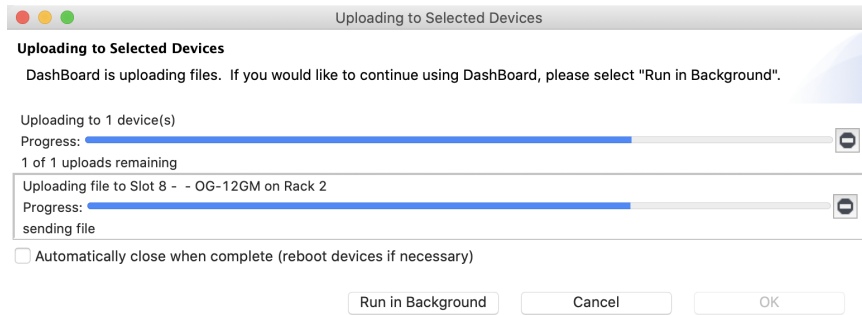
1. Check the AJA website for new software for your OG-12GM. If new software is found, download it and uncompress the file archive (zip).
2. Click the Upload button in the lower panel of the DashBoard Control System to open the Upload Software Wizard.

*Figure 21. OG-12GM Upload Software Wizard window in DashBoard*



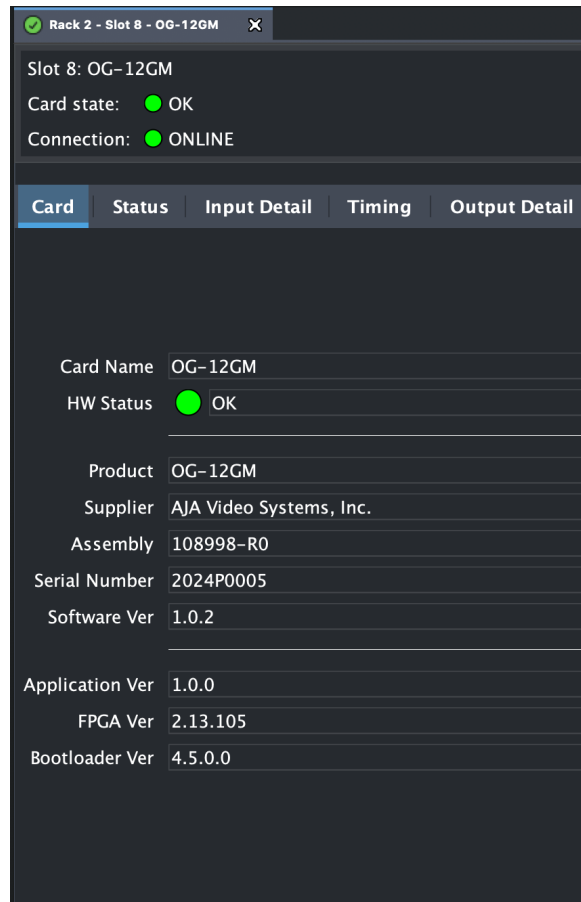
3. From the Upload Software Wizard window, select **Browse**.
4. Navigate to the location of the downloaded .bin file containing the software update. Select the .bin file, then select **Open**. The Upload Software Wizard window displays characteristics of the selected file for uploading.
5. Click **Finish**. The uploading process begins.

Figure 22. OG-12GM Uploading to Selected Devices window in Dashboard



6. When the progress bar indicates that the uploading is finished and status indicates "Complete," click **OK**.
7. To verify the version of software or firmware currently installed on your card, select the Card tab from the center panel of Dashboard.

Figure 23. OG-12GM Card Tab Screen in Dashboard indicating the currently installed software version.



## Rebooting

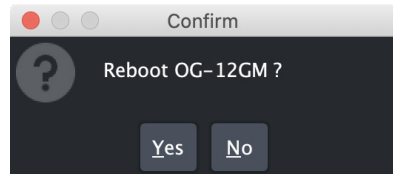
Rebooting is a standard function built in to the Dashboard Control System, and should only be performed if the board has become unresponsive.

**WARNING:** *During a reboot, any card operations will be briefly interrupted, but will be restored once the reboot has completed.*

To Reboot the OG-12GM

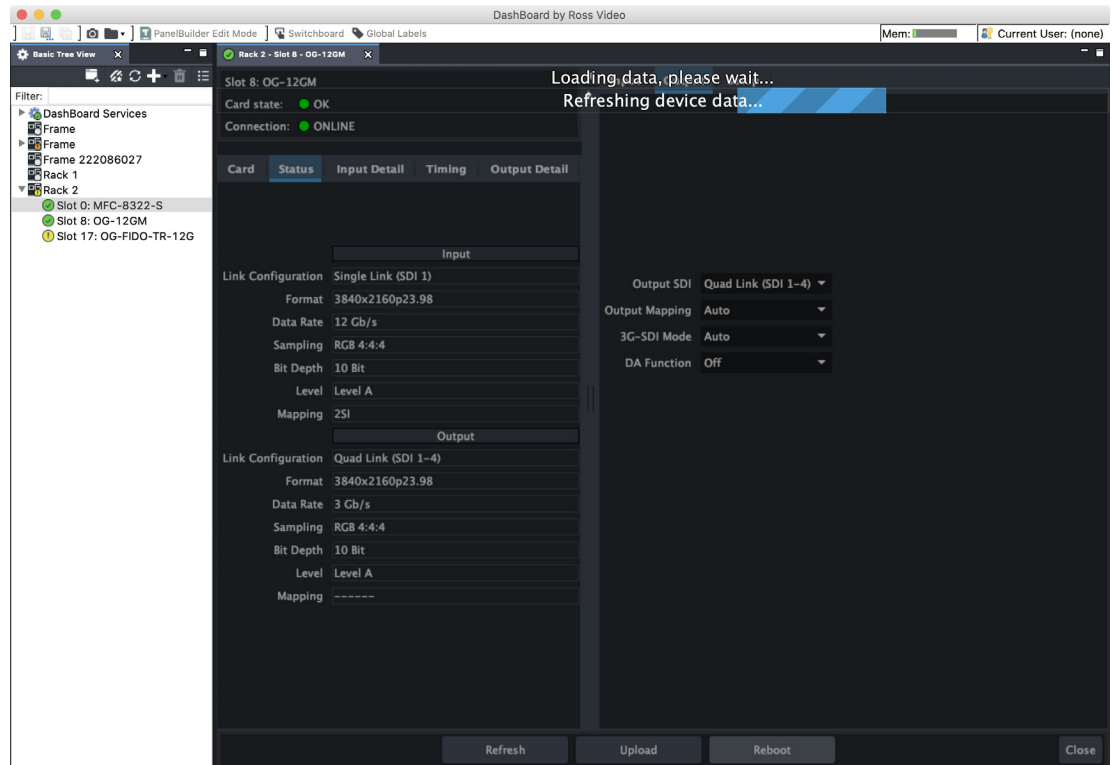
1. Click the Reboot button in the lower panel of Dashboard. The reboot confirmation message displays.

Figure 24. Reboot confirmation window



2. Click **Yes**. The message "Loading data, please wait. Refreshing device data" displays for a moment. The card will be offline for a few seconds, and any current operations will be interrupted.

Figure 25. The OG-12GM briefly pauses operations while rebooting



3. Following a Reboot operation, the board configuration will return to the settings that were in place at the time of rebooting.

# Appendix A – Specifications

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## OG-12GM Tech Specs

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### Video Formats

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- (4K) 4096x2160p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- (UltraHD) 3840x2160p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- (2K) 2048x1080p 50, 59.94, 60
- (HD) 1920x1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- (HD) 1920x1080i 50, 59.94, 60
- (HD) 1280x720p 50, 59.94, 60
- (SD) 625i 50
- (SD) 525i 59.94
- RGB and YCbCr, 4:4:4/4:2:2/4:2:0, 8, 10, 12-bit

*NOTE: Raster and Frame Rate Dependent, please see OG-12GM Video Formats in Documents and Manual.*

### Video Input Digital

---

- 4x 12G-SDI BNC, SMPTE 259/292/424/2081/2082
  - Single Link 12G/6G/3G/1.5G/SD-SDI
  - Quad Link 3G-SDI Level A or B-DL (4x 3G), SMPTE 425-5
  - Single Link 3G-SDI Level A, B-DL, or B-DS, SMPTE 425-1
  - Quad Link HD-SDI (4x 1.5G)

### Video Output Digital

---

- 4x 12G-SDI BNC, SMPTE 259/292/424/2081/2082
  - Single Link 12G/6G/3G/1.5G/SD-SDI
  - Quad Link 3G-SDI Level A or B-DL (4x 3G), SMPTE 425-5
  - Single Link 3G-SDI Level A, B-DL, or B-DS, SMPTE 425-1
  - Quad Link HD-SDI (4x 1.5G)

### Supported Conversions and Functions

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- Quad 3G-SDI Level A to Single 12G-SDI
- Quad 3G-SDI Level B-DL to Single 12G-SDI
- Single 12G-SDI to Quad 3G-SDI Level A
- Single 12G-SDI to Quad 3G-SDI Level B-DL
- Quad 1.5G-SDI to Single 6G-SDI
- Single 6G-SDI to Quad 1.5G-SDI
- Quad 3G-SDI Level A to Quad 3G-SDI Level B-DL
- Quad 3G-SDI Level B-DL to Quad 3G-SDI Level A
- Two Sample Interleave (2SI) to Square Division (Quadrant) pixel mapping
- Square Division (Quadrant) to Two Sample Interleave (2SI) pixel mapping
- Pass through of Single Link 12G, 6G, 3G, 1.5G and 270M SDI video
- Distribution Amplifier support (1x4)
- Input signal diagnostics
- Input timing analyzer for quad link signals

## Cable Equalization

---

(Belden 1694A coax)

- 12 Gbps, 70m
- 6 Gbps, 100m
- 3 Gbps, 140m
- 1.5 Gbps, 200m
- 270 Mbps, 300m

## Audio Input/Output Digital

---

- Passes SDI embedded audio, 24-bit, up to 16-channels

## User Interface

---

- openGear DashBoard network control software via Windows, macOS or Linux

## Size

---

- openGear standard form factor, front slot and rear card
- Two slots required for each card

## Weight

---

- 0.5 lb (0.3 kg)

## Power

---

- openGear frame compatible, 12 watts max per card

## Environment

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- Safe Operating Temperature: 0 to 40 C (32 to 104 F)
- Safe Storage Temperature (Power OFF): -40 to 60 C (-40 to 140 F)
- Operating Relative Humidity: 10-90% noncondensing
- Operating Altitude: <3,000 meters (<10,000 feet)

## OG-12GM Video I/O Formats

### 4K/UltraHD Inputs Supported

#### 1x 12Gb SDI:

<u>Format</u>	<u>Frame Rate</u>	<u>Colorspace</u>	<u>Sampling</u>	<u>Bit Depth</u>
• 3840x2160p	23.98, 24, 25, 29.97, 30	YCbCr/RGB	4:4:4	10, 12
• 3840x2160p	50, 59.94, 60	YCbCr	4:2:2	10
• 4096x2160p	23.98, 24, 25, 29.97, 30	YCbCr/RGB	4:4:4	10, 12
• 4096x2160p	50, 59.94, 60	YCbCr	4:2:2	10

#### 1x 6Gb SDI:

<u>Format</u>	<u>Frame Rate</u>	<u>Colorspace</u>	<u>Sampling</u>	<u>Bit Depth</u>
• 3840x2160p	23.98, 24, 25, 29.97, 30	YCbCr	4:2:2	10
• 4096x2160p	23.98, 24, 25, 29.97, 30	YCbCr	4:2:2	10

#### 4x 3Gb SDI: (Two Sample Interleave (2SI) or Square Division (SQD) mapping)

<u>Format</u>	<u>Frame Rate</u>	<u>Level A/B</u>	<u>Colorspace</u>	<u>Sampling</u>	<u>Bit Depth</u>
• 3840x2160p	23.98, 24, 25, 29.97, 30	A or B-DL	YCbCr/RGB	4:4:4	10, 12
• 3840x2160p	50, 59.94, 60	A or B-DL	YCbCr	4:2:2	10
• 4096x2160p	23.98, 24, 25, 29.97, 30	A or B-DL	YCbCr/RGB	4:4:4	10, 12
• 4096x2160p	50, 59.94, 60	A or B-DL	YCbCr	4:2:2	10

#### 4x 1.5Gb SDI: (Square Division (SQD) mapping)

<u>Format</u>	<u>Frame Rate</u>	<u>Colorspace</u>	<u>Sampling</u>	<u>Bit Depth</u>
• 3840x2160p	23.98, 24, 25, 29.97, 30	YCbCr	4:2:2	10
• 4096x2160p	23.98, 24, 25, 29.97, 30	YCbCr	4:2:2	10

### 2K/HD Inputs Supported

#### 1x 6Gb SDI:

<u>Format</u>	<u>Frame Rate</u>	<u>Colorspace</u>	<u>Sampling</u>	<u>Bit Depth</u>
• 1920x1080p	50, 59.94, 60	YCbCr/RGB	4:4:4	10, 12
• 2048x1080p	50, 59.94, 60	YCbCr/RGB	4:4:4	10, 12

**1x 3Gb SDI:**

<u>Format</u>	<u>Frame Rate</u>	<u>Level A/B</u>	<u>Colorspace</u>	<u>Sampling</u>	<u>Bit Depth</u>
• 1280x720p	50, 59.94, 60	A	YCbCr/RGB	4:4:4	10
• 1920x1080i	50, 59.94, 60	A or B-DL	YCbCr/RGB	4:4:4	10
• 1920x1080p	23.98, 24, 25, 29.97, 30	A or B-DL	YCbCr/RGB	4:4:4	10, 12
• 1920x1080p	50, 59.94, 60	A or B-DL	YCbCr	4:2:2	10
• 2048x1080p	23.98, 24, 25, 29.97, 30	A or B-DL	YCbCr/RGB	4:4:4	10, 12
• 2048x1080p	50, 59.94, 60	A or B-DL	YCbCr	4:2:2	10

**1x 1.5Gb SDI:**

<u>Format</u>	<u>Frame Rate</u>	<u>Colorspace</u>	<u>Sampling</u>	<u>Bit Depth</u>
• 1280x720p	50, 59.94, 60	YCbCr	4:2:2	10
• 1920x1080i	50, 59.94, 60	YCbCr	4:2:2	10
• 1920x1080p	23.98, 24, 25, 29.97, 30	YCbCr	4:2:2	10
• 2048x1080p	23.98, 24, 25, 29.97, 30	YCbCr	4:2:2	10

**SD Inputs Supported**

**1x 270Mb SDI:**

<u>Format</u>	<u>Frame Rate</u>	<u>Colorspace</u>	<u>Sampling</u>	<u>Bit Depth</u>
• 525i	59.94	YCbCr	4:2:2	10
• 625i	50	YCbCr	4:2:2	10



# Appendix B – Safety and Compliance

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## Federal Communications Commission (FCC) Compliance Notices

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### Class A Interference Statement

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15, Subpart B of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### FCC Caution

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## Canadian ICES Statement

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### Canadian Department of Communications Radio Interference Regulations

This digital apparatus does not exceed the Class A limits for radio-noise emissions from a digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications. This Class A digital apparatus complies with Canadian ICES-003.

### Règlement sur le brouillage radioélectrique du ministère des Communications

Cet appareil numérique respecte les limites de bruits radioélectriques visant les appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada. Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

## European Union and European Free Trade Association (EFTA) Regulatory Compliance

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This equipment may be operated in the countries that comprise the member countries of the European Union and the European Free Trade Association. These countries, listed in the following paragraph, are referred to as The European Community throughout this document:

AUSTRIA, BELGIUM, BULGARIA, CYPRUS, CZECH REPUBLIC, DENMARK, ESTONIA, FINLAND, FRANCE, GERMANY, GREECE, HUNGARY, IRELAND, ITALY, LATVIA, LITHUANIA, LUXEMBOURG, MALTA, NETHERLANDS, POLAND, PORTUGAL, ROMANIA, SLOVAKIA, SLOVENIA, SPAIN, SWEDEN, UNITED KINGDOM, ICELAND, LICHTENSTEIN, NORWAY, SWITZERLAND

## Declaration of Conformity

Marking by this symbol indicates compliance with the Essential Requirements of the EMC Directive of the European Union 2014/30/EU.



This equipment meets the following conformance standards:

### Safety

EN 60065: 2014 (T-Mark License),  
IEC 60065: 2014 (CB Scheme Report/Certificate)  
EN 62368-1: 2014 + A11 (T-Mark License)  
IEC 62368-1: 2014 (CB Scheme Certificate)

Additional licenses issued for specific countries available on request.

### Emissions

EN 55032: 2012 + AC: 2013, CISPR 32: 2015, EN 61000-3-2: 2014, EN 61000-3-3: 2013

### Immunity

EN 55103-2: 2009, EN 61000-4-2: 2009, EN 61000-4-3: 2006+ A1: 2008 + A2: 2010,  
EN 61000-4-4: 2012, EN 61000-4-5: 2014/A1: 2017, EN 61000-4-6: 2013,  
EN 61000-4-11: 2020

Environments: E2, E3 and E4

The product is also licensed for additional country specific standards as required for the International Marketplace



**Warning!** This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take appropriate measures.

**Achtung!** Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

**Attention!** Ceci est un produit de Classe A. Dans un environnement domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées..

## Recycling Notice



This symbol on the product or its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste for recycling, please contact your local authority, or where you purchased your product.

## Korea KCC Compliance Statement

### 사용자안내문

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

## Taiwan Compliance Statement

警告使用者：  
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

This is a Class A product based on the standard of the Bureau of Standards, Metrology and Inspection (BSMI) CNS 13438, Class A. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

## Japanese Compliance Statement

この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A

This is a Class A product based on the standard of the VCCI Council (VCCI 32: 2016). If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

## Translated Warning and Caution Messages

The following caution statements, warning conventions, and warning messages apply to this product and manual.



Warning Symbol



Hazard Symbol



Caution Symbol

## Before Operation Please Read These Instructions



**Warning!** Read and follow all warning notices and instructions marked on the product or included in the documentation.

**Avertissement!** Lisez et conformez-vous à tous les avis et instructions d'avertissement indiqués sur le produit ou dans la documentation.

**Warnung!** Lesen und befolgen Sie die Warnhinweise und Anweisungen, die auf dem Produkt angebracht oder in der Dokumentation enthalten sind.

**¡Advertencia!** Lea y siga todas las instrucciones y advertencias marcadas en el producto o incluidas en la documentación.

**Aviso!** Leia e siga todos os avisos e instruções assinalados no produto ou incluídos na documentação.

**Avviso!** Leggere e seguire tutti gli avvisi e le istruzioni presenti sul prodotto o inclusi nella documentazione.



**Warning!** Do not use this device near water and clean only with a dry cloth.

**Avertissement!** N'utilisez pas cet appareil près de l'eau et nettoyez-le seulement avec un tissu sec.

**Warnung!** Das Gerät nicht in der Nähe von Wasser verwenden und nur mit einem trockenen Tuch säubern.

**¡Advertencia!** No utilice este dispositivo cerca del agua y límpielo solamente con un paño seco.

**Aviso!** Não utilize este dispositivo perto da água e limpe-o somente com um pano seco.

**Avviso!** Non utilizzare questo dispositivo vicino all'acqua e pulirlo soltanto con un panno asciutto.



**Warning!** Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

**Avertissement!** Ne bloquez aucune ouverture de ventilation. Suivez les instructions du fabricant lors de l'installation.

**Warnung!** Die Lüftungsöffnungen dürfen nicht blockiert werden. Nur gemäß den Anweisungen des Herstellers installieren.

**¡Advertencia!** No bloquee ninguna de las aberturas de la ventilación. Instale de acuerdo con las instrucciones del fabricante.

**Aviso!** Não obstrua nenhuma das aberturas de ventilação. Instale de acordo com as instruções do fabricante.

**Avviso!** Non ostruire le aperture di ventilazione. Installare in conformità con le istruzioni del fornitore.



**Warning!** Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

**Avertissement!** N'installez pas l'appareil près d'une source de chaleur telle que des radiateurs, des bouches d'air de chauffage, des fourneaux ou d'autres appareils (amplificateurs compris) qui produisent de la chaleur.

**Warnung!** Nicht in der Nähe von Wärmequellen wie Heizkörpern, Heizregistern, Öfen oder anderen Wärme erzeugenden Geräten (einschließlich Verstärkern) aufstellen.

**¡Advertencia!** No instale cerca de fuentes de calor tales como radiadores, registros de calor, estufas u otros aparatos (incluidos amplificadores) que generan calor.

**Aviso!** Não instale perto de nenhuma fonte de calor tal como radiadores, saídas de calor, fogões ou outros aparelhos (incluindo amplificadores) que produzam calor.

**Avviso!** Non installare vicino a fonti di calore come termosifoni, diffusori di aria calda, stufe o altri apparecchi (amplificatori compresi) che emettono calore



**Warning!** Refer all servicing to qualified service personnel. Servicing is required when the device has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the device, the device has been exposed to rain or moisture, does not operate normally, or has been dropped.

**Avertissement!** Référez-vous au personnel de service qualifié pour tout entretien. L'entretien est exigé quand l'appareil a été endommagé de quelque manière que ce soit, par exemple lorsque le cordon d'alimentation ou la prise sont endommagés, que du liquide a été versé ou des objets sont tombés dans l'appareil, que l'appareil a été exposé à la pluie ou à l'humidité, ne fonctionne pas normalement ou est tombé.

**Warnung!** Das Gerät sollte nur von qualifizierten Fachkräften gewartet werden. Eine Wartung ist fällig, wenn das Gerät in irgendeiner Weise beschädigt wurde, wie bei beschädigtem Netzkabel oder Netzstecker, falls Flüssigkeiten oder Objekte in das Gerät gelangen, das Gerät Regen oder Feuchtigkeit ausgesetzt wurde, nicht ordnungsgemäß funktioniert oder fallen gelassen wurde.

**¡Advertencia!** Consulte al personal calificado por cuestiones de reparación. El servicio de reparación se requiere cuando el dispositivo ha recibido cualquier tipo de daño, por ejemplo cable o espigas dañadas, se ha derramado líquido o se han caído objetos dentro del dispositivo, el dispositivo ha sido expuesto a la lluvia o humedad, o no funciona de modo normal, o se ha caído.

**Aviso!** Remeta todos os serviços de manutenção para o pessoal de assistência qualificado. A prestação de serviços de manutenção é exigida quando o dispositivo foi danificado mediante qualquer forma, como um cabo de alimentação ou ficha que se encontra danificado/a, quando foi derramado líquido ou caíram objectos sobre o dispositivo, quando o dispositivo foi exposto à chuva ou à humidade, quando não funciona normalmente ou quando foi deixado cair.

**Avviso!** Fare riferimento al personale qualificato per tutti gli interventi di assistenza. L'assistenza è necessaria quando il dispositivo è stato danneggiato in qualche modo, ad esempio se il cavo di alimentazione o la spina sono danneggiati, è stato rovesciato del liquido è stato rovesciato o qualche oggetto è caduto nel dispositivo, il dispositivo è stato esposto a pioggia o umidità, non funziona correttamente o è caduto



**Warning!** Disconnect the external AC power supply line cord(s) from the mains power before moving the unit.

**Avertissement!** Retirez le ou les cordons d'alimentation en CA de la source d'alimentation principale lorsque vous déplacez l'appareil.

**Warnung!** Trennen Sie die Wechselstrom-Versorgungskabel vom Netzstrom, bevor Sie das Gerät verschieben.

**¡Advertencia!** Cuando mueva la unidad desenchufe de la red eléctrica el/los cable(s) de la fuente de alimentación CA tipo brick.

**Advertência!** Remova os cabos CA de alimentação brick da rede elétrica ao mover a unidade.

**Avvertenza!** Scollegare il cavo dell'alimentatore quando si sposta l'unità.



**Hazard!** High Voltage. This situation or condition can cause injury due to electric shock.

**Avertissement!** Tension élevée. Cette situation ou condition peut causer des blessures dues à un choc électrique.

**Warnung!** Hochspannung. Diese Situation oder Bedingung kann zu Verletzungen durch Stromschlag führen.

**¡Advertencia!** Alto voltaje . Esta situación o condición puede causar lesiones debidas a una descarga eléctrica.

**Aviso!** Alta Tensão . Esta situação ou condição pode causar danos devido a choques elétricos.

**Avviso!** Alta tensione. Questa situazione o condizione può causare lesioni a causa di scosse elettriche.



**Warning!** Only use attachments and accessories specified and/or sold by the manufacturer.

**Avertissement!** Utilisez seulement les attaches et accessoires spécifiés et/ou vendus par le fabricant.

**Warnung!** Verwenden Sie nur Zusatzgeräte und Zubehör angegeben und / oder verkauft wurde durch den Hersteller.

**¡Advertencia!** Utilice solamente los accesorios y conexiones especificados y/o vendidos por el fabricante.

**Aviso!** Utilize apenas equipamentos/acessórios especificados e/ou vendidos pelo fabricante.

**Avviso!** Utilizzare soltanto i collegamenti e gli accessori specificati e/o venduti dal produttore.



**Warning!** Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

**Avertissement!** La sécurité de la prise polarisée ou de la prise de type mise à la terre ne doit en aucun cas être empêchée de fonctionner. Une prise polarisée a deux broches, l'une étant plus large que l'autre. Une prise de type mise à la terre a deux broches et une troisième broche pour la mise à la terre. La broche large ou la troisième broche sont fournies pour votre sécurité. Si la prise fournie ne s'insère pas dans votre prise femelle, consultez un électricien pour le remplacement de la prise femelle obsolète.

**Warnung!** Der Sicherheitszweck des gepolten bzw. Schukosteckers ist zu berücksichtigen. Ein gepolter Stecker verfügt über zwei Pole, von denen einer breiter als der andere ist. Ein Schukostecker verfügt neben den zwei Polen noch über einen dritten Pol zur Erdung. Der breite Pol bzw. der Erdungspol dienen der Sicherheit. Wenn der zur Verfügung gestellte Stecker nicht in Ihren Anschluss passt, konsultieren Sie einen Elektriker, um den veralteten Anschluss zu ersetzen.

**¡Advertencia!** No eche por tierra la finalidad del tipo de enchufe polarizado con conexión a tierra. Un enchufe polarizado tiene dos espigas, una más ancha que la otra. Un enchufe con conexión a tierra tiene dos espigas iguales y una tercera espiga que sirve para la conexión a tierra. La espiga ancha, o la tercera espiga, sirven para su seguridad. Si el enchufe suministrado no encaja en el tomacorriente, consulte con un electricista para reemplazar el tomacorriente obsoleto.

**Aviso!** Não anule a finalidade da segurança da ficha polarizada ou do tipo ligação terra. Uma ficha polarizada tem duas lâminas sendo uma mais larga do que a outra. Uma ficha do tipo de ligação à terra tem duas lâminas e um terceiro terminal de ligação à terra. A lâmina larga ou o terceiro terminal são fornecidos para sua segurança. Se a ficha fornecida não couber na sua tomada, consulte um electricista para a substituição da tomada obsoleta.

**Avviso!** Non compromettere la sicurezza della spina polarizzata o con messa a terra. Una spina polarizzata ha due spinotti, di cui uno più largo. Una spina con messa a terra ha due spinotti e un terzo polo per la messa a terra. Lo spinotto largo o il terzo polo sono forniti per motivi di sicurezza. Se la spina fornita non si inserisce nella presa di corrente, contattare un elettricista per la sostituzione della presa obsoleta.



**Warning!** Since the Mains plug is used as the disconnection for the device, it must remain readily accessible and operable.

**Avertissement!** Puisque la prise principale est utilisée pour débrancher l'appareil, elle doit rester aisément accessible et fonctionnelle.

**Warnung!** Da der Netzstecker als Trennvorrichtung dient, muss er stets zugänglich und funktionsfähig sein.

**¡Advertencia!** Puesto que el enchufe de la red eléctrica se utiliza como dispositivo de desconexión, debe seguir siendo fácilmente accesible y operable.

**Aviso!** Dado que a ficha principal é utilizada como a desconexão para o dispositivo, esta deve manter-se prontamente acessível e funcional.

**Avviso!** Poiché il cavo di alimentazione viene usato come dispositivo di sconnessione, deve rimanere prontamente accessibile e operabile.



**Warning!** Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the device.

**Avertissement!** Protégez le cordon d'alimentation pour que l'on ne marche pas dessus ou qu'on le pince, en particulier au niveau des prises mâles, des réceptacles de convenance, et à l'endroit où il sort de l'appareil.

**Warnung!** Vermeiden Sie, dass auf das Netzkabel getreten oder das Kabel geknickt wird, insbesondere an den Steckern, den Steckdosen und am Kabelausgang am Gerät.

**¡Advertencia!** Proteja el cable de energía para que no se le pise ni apriete, en especial cerca del enchufe, los receptáculos de conveniencia y el punto del que salen del equipo.

**Aviso!** Proteja o cabo de alimentação de ser pisado ou de ser comprimido particularmente nas fichas, em tomadas de parede de conveniência e no ponto de onde sai do dispositivo.

**Avviso!** Proteggere il cavo di alimentazione in modo che nessuno ci cammini sopra e che non venga schiacciato soprattutto in corrispondenza delle spine e del punto in cui esce dal dispositivo.



**Warning!** Unplug this device during lightning storms or when unused for long periods of time.

**Avertissement!** Débranchez cet appareil pendant les orages avec éclairs ou s'il est inutilisé pendant de longues périodes.

**Warnung!** Das Gerät ist bei Gewitterstürmen oder wenn es über lange Zeiträume ungenutzt bleibt vom Netz zu trennen.

**¡Advertencia!** Desenchufe este dispositivo durante tormentas eléctricas o cuando no se lo utilice por largos periodos del tiempo.

**Aviso!** Desconecte este dispositivo da tomada durante trovoadas ou quando não é utilizado durante longos períodos de tempo.

**Avviso!** Utilizzare soltanto i collegamenti e gli accessori specificati e/o venduti dal produttore, quali il treppiedi e l'esoscheletro.



**Warning!** Ensure Mains Power is disconnected before installing the OG-12GM modules into the frame, or installing and removing options. If a Mains switch is not provided, the power cord(s) of this equipment provide the means of disconnection. The socket outlet must be installed near the equipment and must be easily accessible.

**Avertissement !** Avant d'installer des modules OG-12GM dans la structure, ainsi qu'avant d'installer ou d'enlever des options, assurez-vous d'avoir déconnecté l'alimentation électrique. S'il n'y a pas d'interrupteur électrique, il faut débrancher les câbles électriques de l'équipement. La prise électrique doit être située à proximité de l'équipement et doit être aisément accessible.

**Achtung!** Sicherstellen, dass die Netzleitung entkoppelt ist, bevor die OG-12GM Module in das Gestell eingebaut oder Wahlteile eingebaut bzw. ausgebaut werden. Wenn kein Netzschalter vorgesehen ist, dient das bzw. dienen die Netzkabel dieser Vorrichtung als Entkopplungsmittel. Die Steckdose muss in der Nähe der Vorrichtung installiert und leicht zugänglich sein.

**Avvertenza.** Accertarsi che l'alimentazione di rete sia scollegata prima di installare i moduli OG-12GM nel frame o di installare e rimuovere componenti opzionali. Se non è presente un interruttore di accensione/spengimento, occorre scollegare il cavo (o i cavi) di alimentazione di questo apparecchio dalla presa di corrente. La presa di corrente deve essere situata presso l'apparecchio e facilmente accessibile.

**Aviso!** Certifique-se que a fonte principal de energia elétrica está desconectada antes de instalar os módulos OG-12GM no bastidor ou antes de instalar e remover opções. Se o interruptor principal não existir, o cabo elétrico deste equipamento proporciona o meio de desconexão. A tomada elétrica deverá ser instalada perto do equipamento e deverá ser de fácil acesso.

**¡Advertencia!** Asegúrese que la red de alimentación está desconectada antes de instalar los módulos OG-12GM en el marco, o la instalación y extracción de opciones. Si no se proporciona un conmutador de red, el cable de alimentación de este equipo proporciona los medios de desconexión. El zócalo tomacorriente debe estar instalado cerca del equipo y debe ser fácilmente accesible.



**Warning!** Dual Power Cord Notice—please read this. To reduce the risk of electrical shock, disconnect both power cords before servicing equipment.

**Avertissement !** Avis concernant la double alimentation électrique—à lire soigneusement. Pour éviter tout risque d'électrocution, débranchez les deux câbles électriques avant d'intervenir sur l'équipement.

**Achtung!** Hinweis auf Doppel-Netzkabel-bitte lesen. Um das Risiko eines Elektroschocks zu verringern, müssen beide Netzkabel ausgestöpselt werden, bevor die Vorrichtung gewartet wird.

**Avvertenza.** Avviso concernente il cavo di alimentazione doppio - leggere attentamente. Per ridurre il rischio di elettrocuzione, scollegare entrambi i cavi di alimentazione prima di eseguire la manutenzione o riparazioni di questo apparecchio.

**Aviso!** Aviso de Cabo Elétrico Duplo - por favor, leia isto. Para reduzir o risco de choque elétrico, desconecte ambos os cabos elétricos antes de fazer manutenção ao equipamento.

**¡Advertencia!** Aviso del doble cable de alimentación - leer esto por favor. Para reducir el riesgo de descarga eléctrica, desconecte ambos cables de alimentación antes de dar servicio al equipo.



**Caution!** The OG-X-FR front fan door is heavy. Remove with Caution.

**Attention!** La porte du ventilateur avant OG-X-FR est lourde. Retirer avec précaution.

**Achtung!** Die OG-X-FR -Frontlüfter Tür ist schwer. Bitte vorsichtig entfernen.

**¡Precaución!** La puerta del ventilador frontal OG-X-FR es pesado. Extraer con precaución.

**Atenção!** A porta do ventilador frontal OG-X-FR é pesado. Remova com cuidado.

**Attenzione!** La porta ventola anteriore OG-X-FR è pesante. Rimuovere con cautela.





**Warning!** Do not open the chassis. There are no user-serviceable parts inside. Opening the chassis will void the warranty unless performed by an AJA service center or licensed facility.

**Avertissement!** Ne pas ouvrir le châssis. Aucun élément à l'intérieur du châssis ne peut être réparé par l'utilisateur. La garantie sera annulée si le châssis est ouvert par toute autre personne qu'un technicien d'un centre de service ou d'un établissement agréé AJA.

**Warnung!** Öffnen Sie das Gehäuse nicht. Keine der Geräteteile können vom Benutzer gewartet werden. Durch das Öffnen des Gehäuses wird die Garantie hinfällig, es sei denn, solche Wartungsarbeiten werden in einem AJA-Service-Center oder einem lizenzierten Betrieb vorgenommen.

**¡Advertencia!** No abra el chasis. El interior no contiene piezas reparables por el usuario. El abrir el chasis anulará la garantía a menos que se lo haga en un centro de servicio AJA o en un local autorizado.

**Advertência!** Não abra o chassi. Não há internamente nenhuma peça que permita manutenção pelo usuário. Abrir o chassi anula a garantia, a menos que a abertura seja realizada por uma central de serviços da AJA ou por um local autorizado.

**Avvertenza!** Non aprire lo chassis. All'interno non ci sono parti riparabili dall'utente. L'apertura dello chassis invaliderà la garanzia se non viene effettuata da un centro ufficiale o autorizzato AJA.



**Caution!** To meet safety regulations for leakage current, connect the dual power supplies to separate branch circuits.

**¡Advertencia!** Para cumplir con las normas de seguridad para la corriente de fuga, conecte las dos fuentes de alimentación para circuitos derivados diferentes.

**Attention!** Pour répondre aux mesures de sécurité concernant le courant de fuite, raccorder les sources d'alimentation doubles à des circuits de dérivation distincts.

**Warnung!** Zur Erfüllung der Sicherheitsbestimmungen bezüglich Reststrom schließen Sie bitte die zwei Netzteile an unterschiedlichen Abzweigleitungen an.

**Cuidado!** Para atender aos regulamentos de segurança para correntes de fuga, conecte as fontes duplas a circuitos elétricos separados.

**Attenzione!** Per soddisfare le norme di sicurezza sulla corrente di perdita, collegare i doppi alimentatori a circuiti derivati separati.

# Warranty and Liability Information

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## Limited Warranty on Hardware

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AJA Video Systems, Inc. (AJA Video) warrants that the hardware product, not including software components, will be free from defects in materials and workmanship for a period of five years from the date of purchase. AJA Video provides a separate software warranty as part of the license agreement applicable to software components.

If the Customer brings a valid claim under this limited warranty for a hardware product (hereafter, a “product”) during the applicable warranty period, AJA Video will, at its sole option and as the Customer’s sole remedy for breach of the above warranty, provide one of the following remedies:

- Repair or facilitate the repair the product within a reasonable period of time, free of charge for parts and labor.
- Replace the product with a direct replacement or with a product that performs substantially the same function as the original product.
- Issue a refund of the original purchase price less depreciation to be determined based on the age of the product at the time remedy is sought under this limited warranty.

To obtain service under this warranty, the Customer must notify AJA Video of the defect before expiration of the warranty period and make suitable arrangements for the performance of service by contacting AJA Video support through the channels set forth on the support contacts web page at <https://www.aja.com/support>. Except as stated, the Customer shall bear all shipping, packing, insurance and other costs, excluding parts and labor, to effectuate repair. Customer shall pack and ship the defective product to a service center designated by AJA Video, with shipping charges prepaid. AJA Video shall pay to return the product to Customer, but only if to a location within the country in which the AJA Video service center is located. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES OR LIMITATIONS ON APPLICABLE STATUTORY RIGHTS OF A CONSUMER, SO SOME OR ALL OF THE TERMS OF THIS PARAGRAPH MAY NOT APPLY TO YOU.

## Limitation of Liability

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Under no circumstances shall AJA video BE LIABLE IN ANY WAY FOR ANY LOST, CORRUPTED OR DESTROYED DATA, FOOTAGE OR WORK, OR FOR ANY OTHER INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOST PROFITS, OR FOR ANY THIRD PARTY CLAIM, IN CONNECTION WITH THE PRODUCT, WHETHER RESULTING FROM DEFECTS IN THE PRODUCT, SOFTWARE OR HARDWARE FAILURE, OR ANY OTHER CAUSE WHATSOEVER, EVEN IF AJA VIDEO HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. AJA VIDEO’S LIABILITY IN CONNECTION WITH THE PRODUCT SHALL UNDER NO CIRCUMSTANCES EXCEED THE PURCHASE PRICE PAID FOR THE PRODUCT. The foregoing limitations apply even if any remedy set forth in this LIMITED WARRANTY fails of its essential purpose. SOME JURISDICTIONS DO NOT ALLOW THE LIMITATION OF LIABILITY FOR PERSONAL INJURY, OR OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO SOME OR ALL OF THE TERMS OF THIS PARAGRAPH MAY NOT APPLY TO YOU.

## Governing Law and Language; Your Rights

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This limited warranty is the only warranty provided by AJA Video on the hardware product. It supersedes all prior or contemporaneous understandings regarding such subject matter. No amendment to or modification of this warranty will be binding unless in writing and signed by AJA Video. The laws of the State of California, USA will govern this warranty and any dispute arising from it. Any translation of this

Agreement is intended for convenience and to meet local requirements and in the event of a dispute between the English and any non-English versions, the English version of this warranty will govern. This limited warranty gives you specific legal rights and you may have other rights that vary from jurisdiction to jurisdiction, some of which are noted above.

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