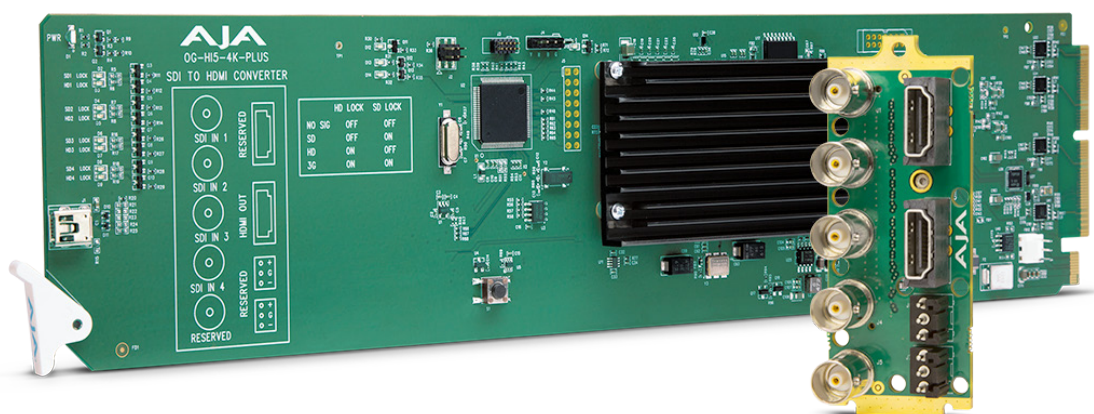


OG-Hi5-4K-Plus

3G-SDI to HDMI 2.0 Converter



Installation and Operation Guide

Version 1.7.4
Published October 11, 2022



Notices

Trademarks

AJA® and Because it matters.® are registered trademarks of AJA Video Systems, Inc. for use with most AJA products. AJA™ is a trademark of AJA Video Systems, Inc. for use with recorder, router, software and camera products. Because it matters.™ is a trademark of AJA Video Systems, Inc. for use with camera products.

Corvid Ultra®, Io®, Ki Pro®, KONA®, KUMO®, ROI® and T-Tap® are registered trademarks of AJA Video Systems, Inc.

AJA Control Room™, KiStor™, Science of the Beautiful™, TruScale™, V2Analog™ and V2Digital™ are trademarks of AJA Video Systems, Inc.

All other trademarks are the property of their respective owners.

Copyright

Copyright © 2022 AJA Video Systems, Inc. All rights reserved. All information in this manual is subject to change without notice. No part of the document may be reproduced or transmitted in any form, or by any means, electronic or mechanical, including photocopying or recording, without the express written permission of AJA Video Systems, Inc.

Contacting AJA Support

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:

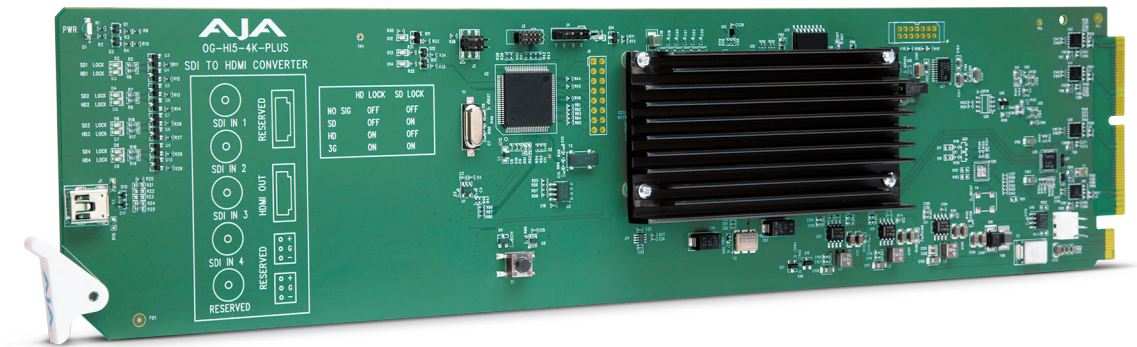
Telephone	+1.530.271.3190
FAX	+1.530.271.3140
Web	https://www.aja.com
Support Email	support@aja.com
Sales Email	sales@aja.com

Contents

Notices	2
Trademarks	2
Copyright	2
Contacting AJA Support	2
Chapter 1 – Introduction	5
Overview	5
Default Operation	5
Features	6
Block Diagram	6
I/O Connections	7
Signal Indicators on the OG-Hi5-4K-Plus Card	7
Signal Indicators in the DashBoard Control System	8
User Controls	10
DashBoard Control System	10
openGear and AJA	11
Installation	11
Summary	11
Unpacking	11
Rear OG-Hi5-4K-Plus Card Installation	11
Front OG-Hi5-4K-Plus Card Installation	12
Cabling	14
Chapter 2 – Operation	15
Using the DashBoard Control System	15
Requirements	15
Configuration Settings Stored in OG Card	15
Control Interface Basic Components	15
Basic Tree View of Frames and Cards	16
Card Information and Status	16
Parameter Controls	16
Card Tab Screen	17
Status Tab Screen	18
Input Tab Screen	19
Video Source	19
Color Space	20
RGB Range	20
Bit Depth	20
Mapping	20
Video Format	20
3G-B Mode	20
Output Tab Screen	21
Color Space	21
Bit Depth	21
RGB Range	21
4K/2K Crop	22
HDMI/DVI	22
HDMI 1.4/2.0	22
HDR Metadata Tab Screen	23
Output Overrides	24
Custom HDMI Metadata	24
Audio Tab Screen	26
Input Source	26
Channel Source	26
Output Channel Count	26
Audio Offset In Frames	26
Setup Tab Screen	27
Card Name	27

Identify Card	27
Factory Settings.	27
Uploading New Software	27
To Upload New Software	27
Rebooting	30
To Reboot the OG-Hi5-4K-Plus	30
Appendix A – Specifications	31
OG-Hi5-4K-Plus Tech Specs	31
Appendix B – Safety and Compliance	36
Limited Warranty on Hardware.	45
Limitation of Liability	45
Governing Law and Language; Your Rights	45
Index.	46

Chapter 1 – Introduction



Overview

AJA's OG-Hi5-4K-Plus is an openGear card that preserves your vision with pristine image fidelity and HFR support up to 60p for 4K/UltraHD SDI to HDMI 2.0 conversion needs. The OG-Hi5-4K-Plus can also generate HDR metadata in accordance with HDMI v2.0b/CTA-861.3 and includes HLG support.

OG-Hi5-4K-Plus provides a simple monitoring connection from professional 4K devices using Quad 3G-SDI, Quad 1.5G-SDI, or Dual 3G-SDI outputs to new displays with HDMI 2.0 inputs, for cost-effective monitoring for 4:4:4/4:2:2 60p professional workflows.

Designed for use in high-density openGear 2RU frames, including AJA's OG-X-FR 2RU frame, the OG-Hi5-4K-Plus is capable of communicating with Ross Video's DashBoard Control System. DashBoard runs on Windows®, macOS® and Linux®, providing convenient, industry-standard configuration, monitoring and control of the openGear architecture over a PC or local network.

Default Operation

The OG-Hi5-4K-Plus auto configures to the connected inputs. The auto-configure function identifies the connected inputs, and outputs the default or user configured HDMI output for the given input.

Ross Video's DashBoard Control System is available for firmware updates and advanced configuration.

NOTE: Signal conversion requires the presence of a valid SDI video signal on one of the SDI IN BNC connectors.

For single SD or HD inputs, SDI Input 1 is the default input. For dual-link 1.5G-SDI inputs, and 4K dual-stream 3G-SDI inputs, SDI Inputs 1 and 2 are the default inputs. Where applicable, both level A and B 3G-SDI inputs are auto-detected and supported.

When connecting the OG-Hi5-4K-Plus with multiple SDI inputs in the auto-configure mode (default), as the user connects the first SDI signal to SDI Input 1, the OG-Hi5-4K-Plus will output that input as a full screen image. As soon as the second input is connected, the OG-Hi5-4K-Plus will determine if it is a multi-input signal and will display the image accordingly.

It is possible to use two dual stream 3G-SDI inputs to make 3840 or 4K video for Square Division (Quadrant) inputs. In that case, SDI Input 1 and SDI Input 2 are assumed to be the inputs. SDI Input 1 linkA makes the top left quadrant, SDI Input 1 linkB makes the top right quadrant, SDI Input 2 linkA makes the lower left quadrant, and SDI Input 2 linkB makes the lower right quadrant. To use this mode, change the Video Source Selection to "2 X SDI 4K" and select 2SI pixel mapping.

NOTE: The OG-Hi5-4K-Plus is an SDI to HDMI converter, not a video format converter, nor a scaling card. Incoming rates are translated to HDMI formats without any scaling. Therefore, whatever video format comes in is what goes out. The OG-Hi5-4K-Plus may output either 4Kx2160 or 3840x2160 if multiple SDI inputs are present with 1.5G-SDI or 3G-SDI on each input and if the monitor can support those resolutions. For 4K input, the OG-Hi5-4K-Plus may provide a center cut 3840, or pass the 4096 to the output, but there is no scaling between the two.

Features

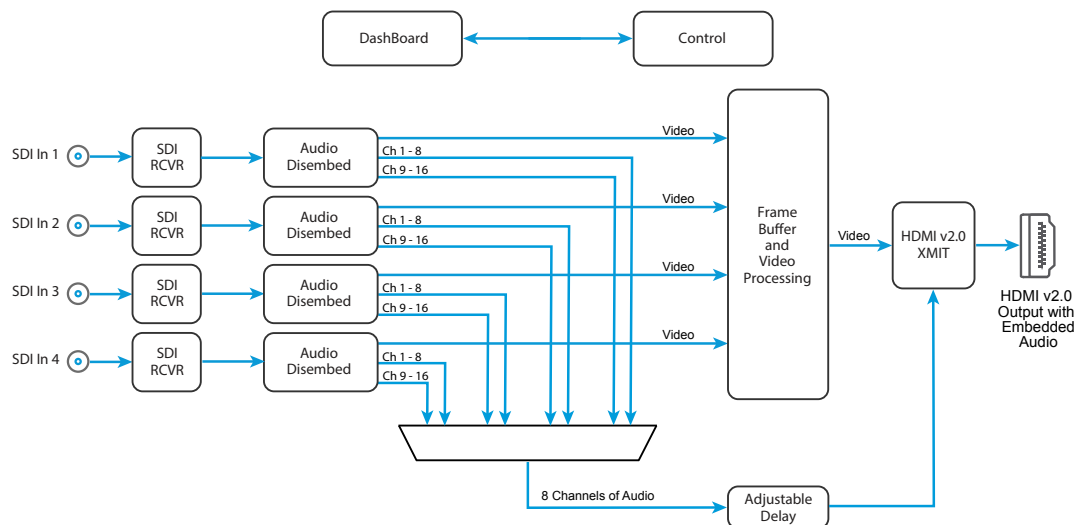
- openGear compatible card (requires 2 slots, rear card included)
- Use with openGear 2RU frames
- Controlled by DashBoard network control software
- Convert Quad-3G-SDI to HDMI 2.0b at up to 4K 60p (see ["Specifications" on page 31](#) for a complete list of supported inputs)
- Support for 4:4:4/4:2:2/4:2:0 HDMI 2.0b output
- HDR signaling metadata pass-through and optional override
- HDR support for HDR10 and HLG
- Embedded audio pass-through of E-AC-3 (Dolby Digital Plus) compressed audio, including DD+ Atmos
- Five year warranty

NOTE: 3D is not supported in this converter.

NOTE: 720p 4:4:4 formats are not supported in this release.

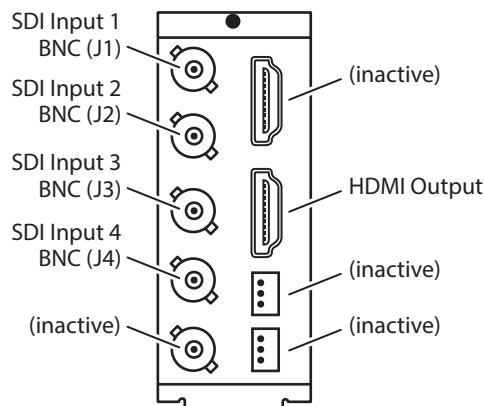
Block Diagram

Figure 1. OG-Hi5-4K-Plus Converter, Simplified Block Diagram



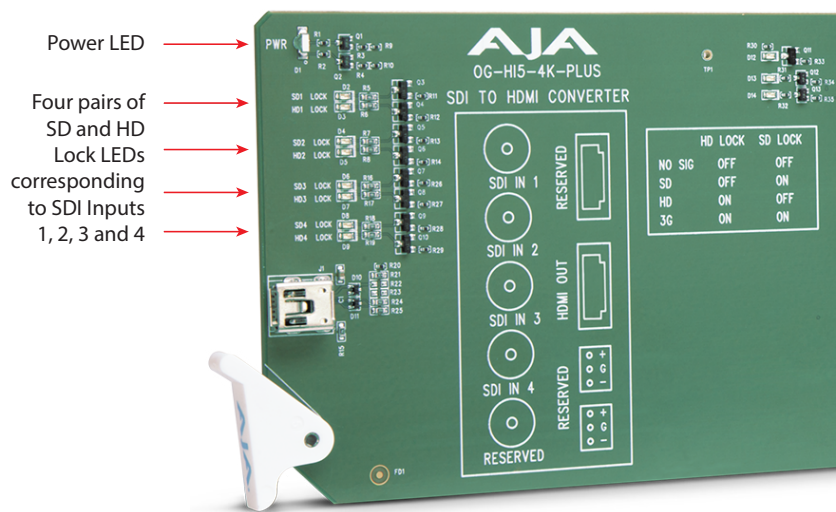
I/O Connections

Figure 2. OG-Hi5-4K-Plus Converter Connections



Signal Indicators on the OG-Hi5-4K-Plus Card

Figure 3. LED lights on card



The Power LED indicates the state of the card as displayed in DashBoard. It will illuminate green if no DashBoard card state alarms are present, yellow if there is a yellow DashBoard card state alarm, and red if there is a red DashBoard card state alarm.

The four pairs of SD and HD Lock LEDs work in combination to indicate the type of signal detected for each SDI input, as described below in [Table 1](#).

Table 1. The meaning of the behaviors of the lights for each pair of SD and HD Lock LEDs

Signal Detected	HD Lock Light	SD Lock Light
No Signal	Off	Off
SD Signal	Off	On
HD Signal	On	Off
3G Signal	On	On

Signal Indicators in the DashBoard Control System

Card Alarm State – Red

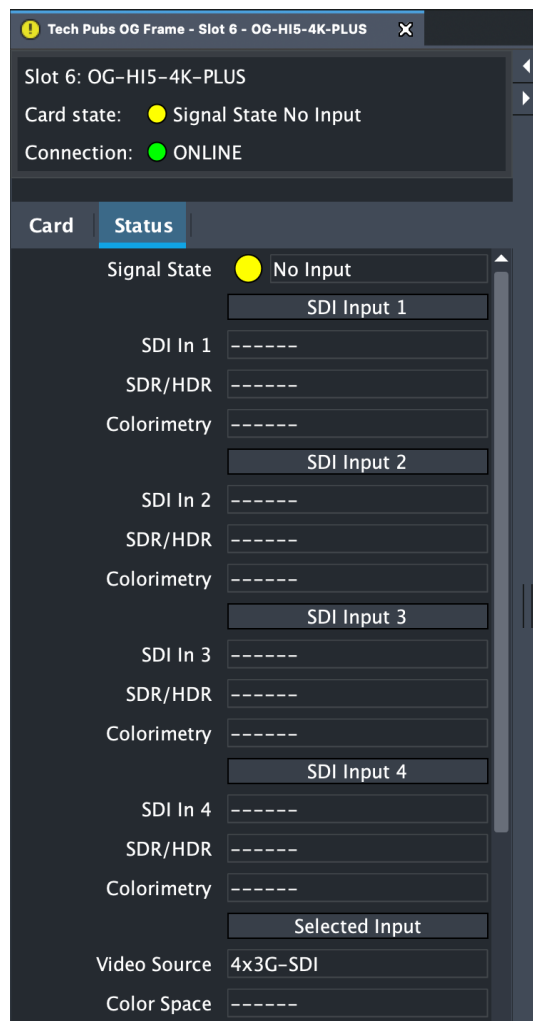
These potential card states will result in a red alarm indicator:

- HW Status Unsupported Rear Module
- HW Status FPGA Load Failure

Card Alarm State – Yellow

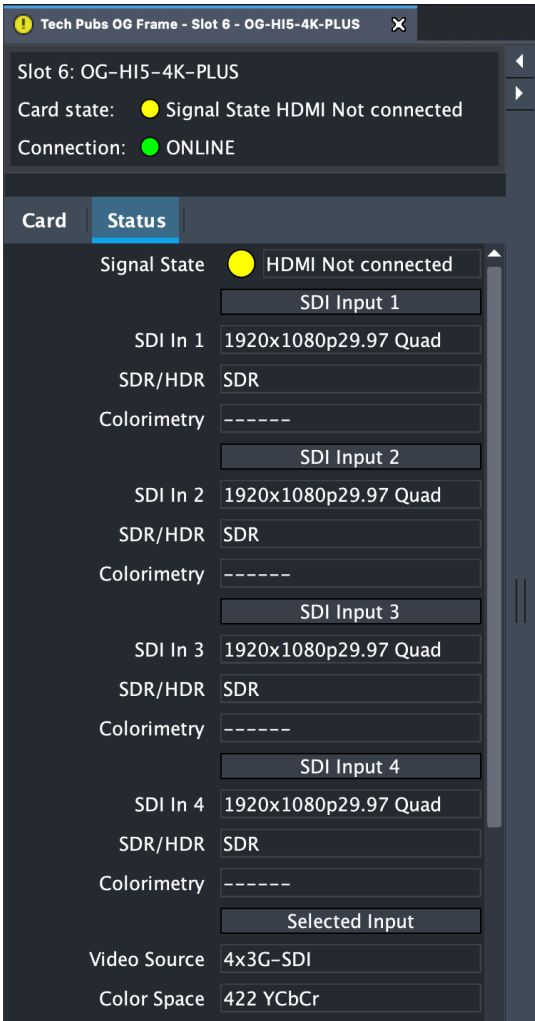
When the signal is either not present or is not locked, the DashBoard Control System shows a yellow Card State alarm: "Signal State No Input." Additionally, the Signal State is shown as "No Input" under the Status tab.

Figure 4. Signal not present or not locked



When there is a valid input signal detected, but the HDMI output cable is not connected, either at the rear panel of the card, or at the HDMI signal destination, the DashBoard Control System shows a yellow Card State alarm: "Signal State HDMI Not connected." Additionally, the Signal State is shown as "HDMI Not connected" under the Status tab.

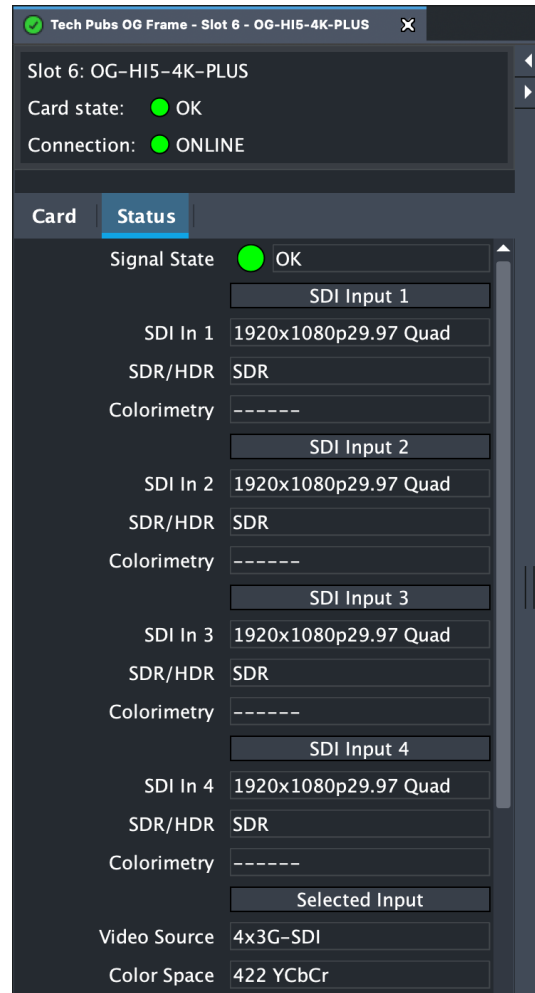
Figure 5. HDMI not connected



Card Alarm State – Green

When there is a valid input signal detected and a valid HDMI sink is connected to the output, the DashBoard Control System shows a green Card State. Additionally, the Signal State is shown as "OK" under the Status tab. The type of SDI Signal detected is also indicated (for example, "1920x1080p29.97 Quad").

Figure 6. Signal is present and locked



User Controls

The OG-Hi5-4K-Plus can be used right out of the box for many applications, since it is designed to recognize inputs and perform standard actions automatically. However, you can also manually configure the OG-Hi5-4K-Plus using remote configuration through the DashBoard Control System for an openGear Frame.

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.

For details about acquiring and using the DashBoard Control System, refer to ["Using the DashBoard Control System" on page 15.](#)

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.

Installation

Summary

Installing an OG-Hi5-4K-Plus card into an OGX or OG3 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-Hi5-4K-Plus card.
- Insert the OG-Hi5-4K-Plus card into the frame in the right (even numbered) slot of the pair.
- Connect the BNC, HDMI and audio 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

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

Quantity	Description
1	OG-Hi5-4K-Plus Front Card in ESD bag
1	5 BNC, 2 HDMI, 2 Audio Rear Card

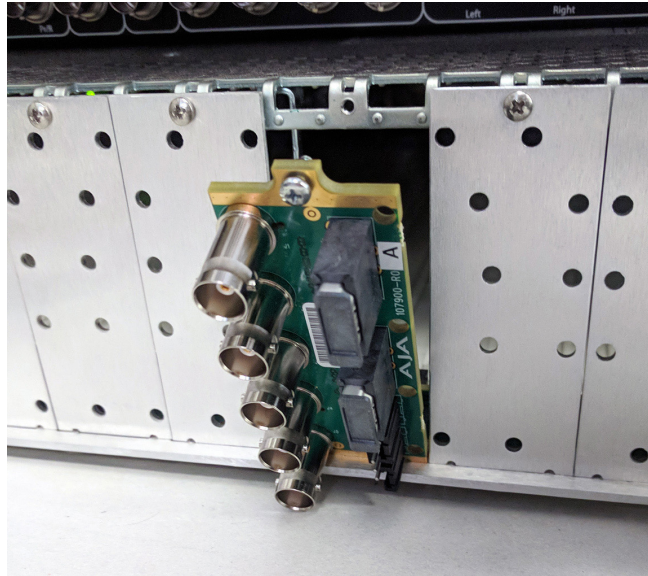
Rear OG-Hi5-4K-Plus Card Installation

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-Hi5-4K-Plus 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 7. 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 8. 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-Hi5-4K-Plus 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-Hi5-4K-Plus 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 9](#).
 - 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 10](#).

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

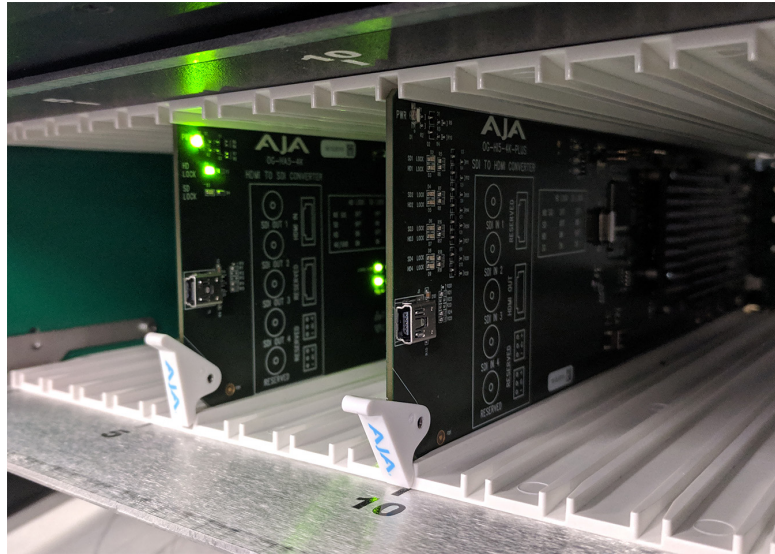


Figure 10. The white plastic tab for the card on the right is now upright. Both cards are shown fully inserted.



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 "I/O Connections" on page 7 to identify the input and output signal connectors.

Chapter 2 – Operation

Using the DashBoard Control System

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

<https://www.opengear.tv/frame-and-control/control-system/download/>

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-Hi5-4K-Plus manual addresses only those essential aspects of the DashBoard Control System needed to control the OG-Hi5-4K-Plus card.

Requirements

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-0G3-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.

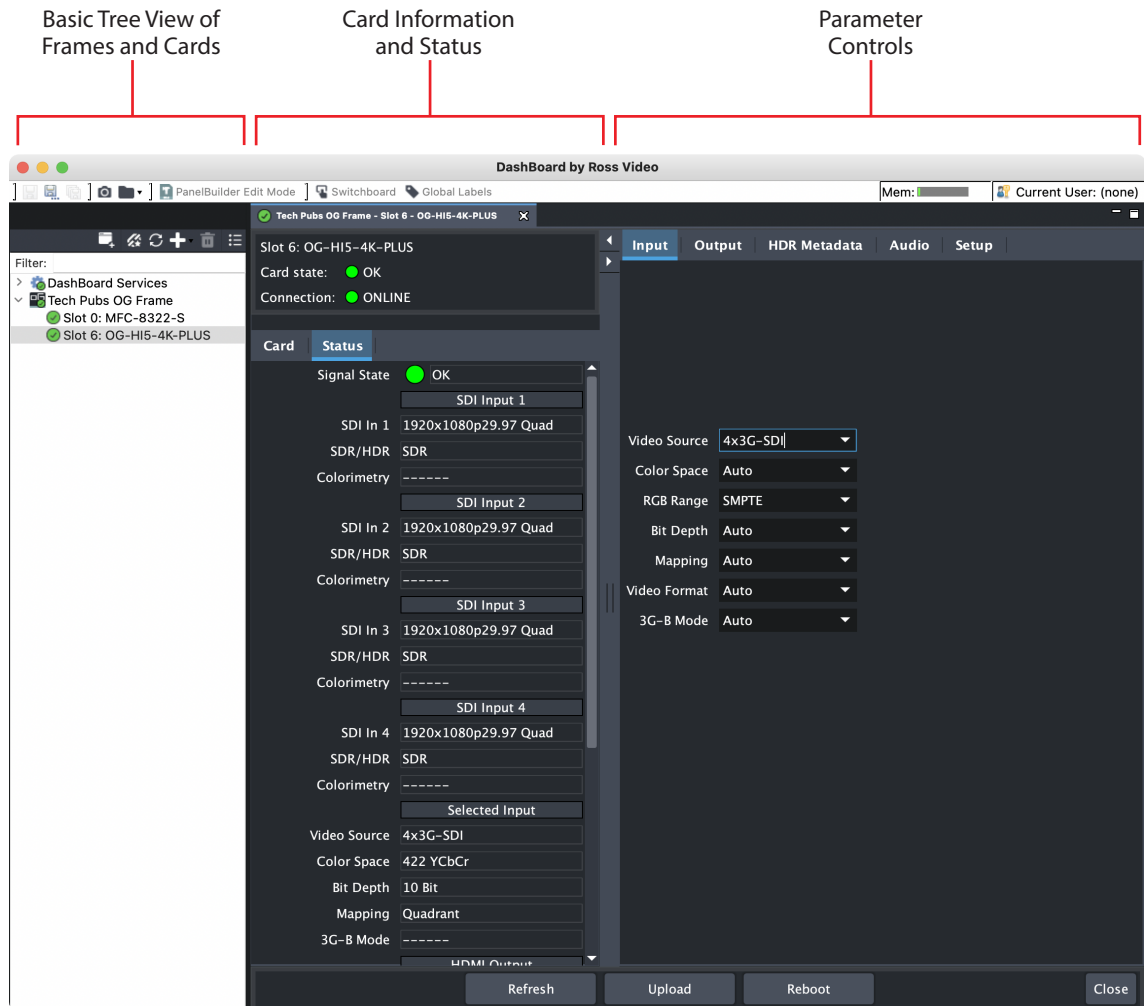
Configuration Settings Stored in OG Card

Configuration settings made through DashBoard are stored in the OG-Hi5-4K-Plus unit through subsequent power cycles.

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 in [Figure 11](#).

Figure 11. 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

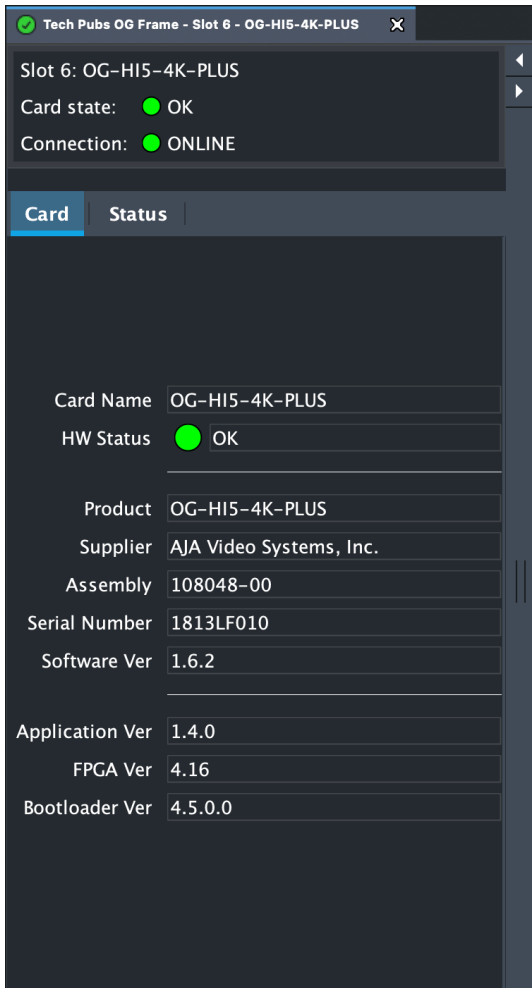
The card information and status panel, shown in the middle panel, display the basic status of the card currently selected in DashBoard. The yellow fields in this panel indicate that they are read-only.

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

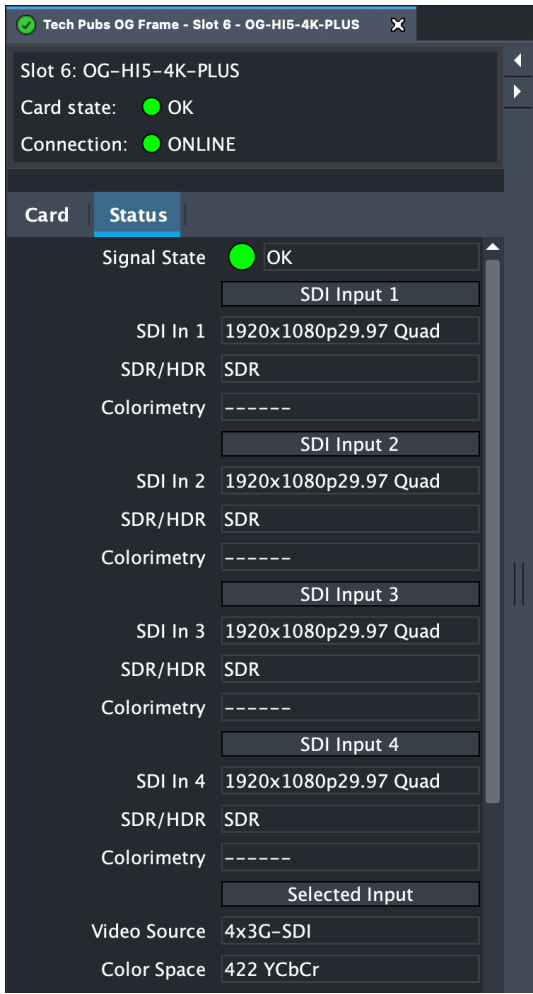
Figure 12. OG-Hi5-4K-Plus Card Tab Screen in DashBoard



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

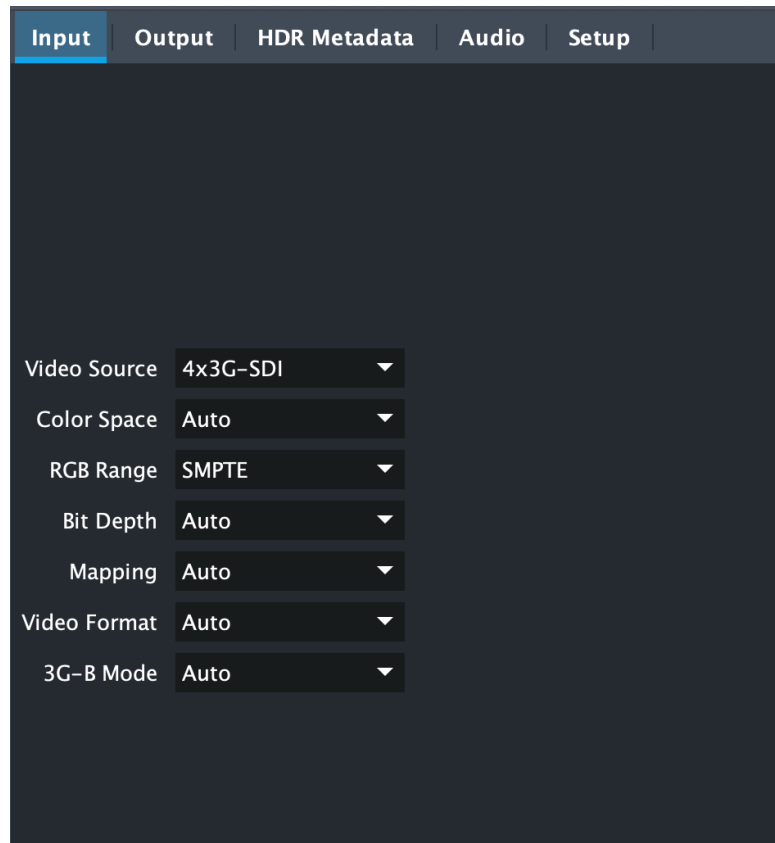
Figure 13. OG-Hi5-4K-Plus Status Tab Screen in Dashboard



The SDI In 1 - 4 status fields report whether the signal is connected, or **No Input**. Each SDI Input status field reports the signal detected by the card's corresponding inputs.

The HDMI Out status field reports the type of HDMI signal generated by the HDMI Output.

Input Tab Screen



Click on the Input tab to view and make changes to the OG-Hi5-4K-Plus input settings.

Video Source

Selects the input video source. Choose from the following:

- Auto - automatically selects the SDI input(s) to use based on validation of input signals from 7 possible SDI transport choices in the following order of priority:
 - 4xSDI 4K (Inputs 1, 2, 3, 4) - 4x 3G-SDI
 - 2xSDI 4K (Inputs 1, 2) - 3G-SDI Level B Dual Stream
 - 2xSDI HD-DL (Inputs 1, 2) - 1.5G-SDI Dual Link
 - SDI 1 - Input 1
 - SDI 2 - Input 2
 - SDI 3 - Input 3
 - SDI 4 - Input 4
- 4xSDI 4K (Inputs 1, 2, 3, 4) - 4x 3G-SDI
- 2xSDI 4K (Inputs 1, 2) - 3G-SDI Level B Dual Stream
- 2xSDI HD-DL (Inputs 1, 2) - 1.5G-SDI Dual Link
- SDI 1, SDI 2, SDI 3, or SDI 4

Please see ["Appendix A – Specifications" on page 31](#) for more details on required signal formats.

Color Space

Selects the Input Video Color Space. Choose from the following:

- Auto - automatically selects color mode based on the input video parameters and payload ID.
- 4:2:2 YCbCr
- 4:4:4 RGB
- 4:4:4 YCbCr
- 4:2:0 YCbCr

RGB Range

Selects the Input Video Color Range when the input is RGB. Does not apply when the input is YCbCr. Choose SMPTE or Full color range.

Bit Depth

Selects the input video bit depth. Choose Auto, 8-bit, 10-bit, or 12-bit. Choosing "Auto" automatically selects the bit depth based on the input video parameters and the payload ID.

Mapping

For signal flows using multi-link 3G signals (4x3G and 2x3G), selects the 4K/ UltraHD mapping format:

- Auto (default) - automatically selects the mapping based on the input video.
- 2SI - Two Sample Interleave
- Quadrant - Square Division

Video Format

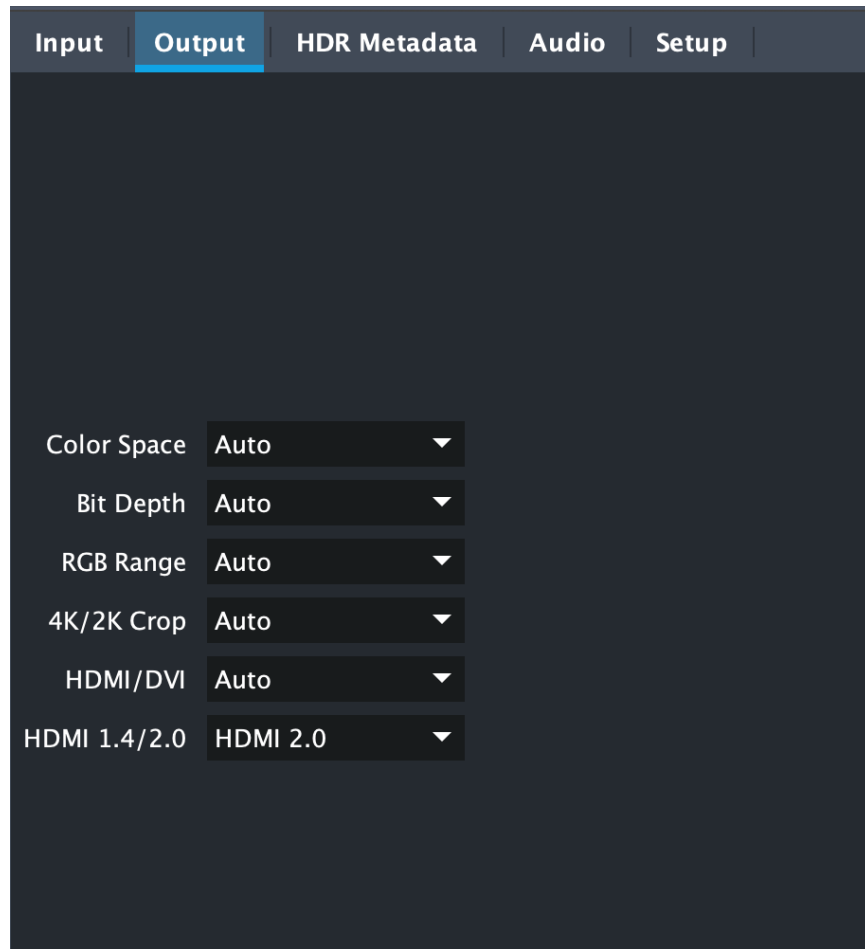
Selects the Input Video Format. Choose from Auto, Progressive (P), Interlaced, or PsF (progressive segmented frame). Choosing "Auto" automatically selects the format based on the input video parameters and the payload ID.

3G-B Mode

Selects the 3G level B Video Mode. Choose from the following:

- Auto - automatically selects the format based on the input video parameters.
- Level B-DL - transmit using Level B Dual-Link format
- Level B-DS - transmit using Level B Dual-Stream format
- Level B-DS Link 1 - transmit using Level B Dual-Stream format, but only send Link 1
- Level B-DS Link 2 - transmit using Level B Dual-Stream format, but only send Link 2

Output Tab Screen



Click on the Output tab to view and make changes to the OG-Hi5-4K-Plus Output settings.

Color Space

Selects the desired output video format. Choose from the following:

- Auto - selects the video format based on the input video and the attached device's capabilities.
- YCbCr 4:2:2
- RGB 4:4:4
- YCbCr 4:4:4

Bit Depth

Choose from Auto, 8-bit, 10-bit, or 12-bit. Choosing "Auto" automatically selects the bit depth based on the input video and the attached device's capabilities. High frame rate (HFR) 4K/UltraHD 4:4:4 limited to 8 bits.

RGB Range

Selects the Output Video Color Range when the output is RGB. Does not apply when the input is YCbCr. Choose SMPTE or Full color range.

4K/2K Crop

Choose Auto, Off, or On. Provides the option of center cutting 2048x1080 video signals to make 1920x1080, or center cutting 4096x2160 signals to make 3840x2160.

HDMI/DVI

Choose Auto, HDMI, or DVI. When DVI is selected, any audio signals present are not passed. Choosing "Auto" automatically selects the output mode based on the attached device's capabilities.

HDMI 1.4/2.0

Choose Auto, HDMI 1.4, or HDMI 2.0.

Your selection for this control will depend on whether you are connected to an HDMI sink device that supports HDMI 2.0 (maximum bandwidth of 18 Gbps) or HDMI 1.4 (maximum bandwidth of 10.2 Gbps).

OG-Hi5-4K-Plus supports HDMI 2.0 and can pass through 4K/UltraHD high frame rate (HFR) signals such as 50, 59.94 or 60.

- Auto (default setting). If connected to an HDMI 2.0 sink device, the 4K UltraHD HFR source will pass straight through with no loss of data. If connected to an HDMI 1.4 sink device, and the video source is 4K or UltraHD with a high frame rate (HFR) including 50, 59.94 or 60, the OG-Hi5-4K-Plus will automatically drop every other video frame, reduce bit depth, or both.
- HDMI 1.4. When the video source is 4K or UltraHD with a high frame rate (HFR) including 50, 59.94 or 60, the OG-Hi5-4K-Plus will automatically drop every other video frame, reduce bit depth, or both. This setting can be used to support connection to an HDMI 1.4 sink device such as a monitor.
- HDMI 2.0. When the video source is 4K or UltraHD with a high frame rate (HFR) including 50, 59.94 or 60, the HDMI 2.0 setting supports the unit in passing through 4K/UltraHD high frame rate (HFR) signals such as 50, 59.94 or 60.

HDR Metadata Tab Screen

The screenshot shows a software interface with a top navigation bar containing five tabs: 'Input', 'Output', 'HDR Metadata' (which is selected and highlighted in blue), 'Audio', and 'Setup'. Below the tabs, the 'HDR Metadata' section is divided into two main areas. The first area, titled 'Output Overrides', contains three dropdown menus: 'SDR/HDR' set to 'HLG', 'Colorimetry' set to 'Auto', and 'HDMI Metadata' set to 'Auto'. The second area, titled 'Custom HDMI Metadata', contains a 'Presets' section with three buttons: 'BT.709', 'BT.2020', and 'DCI-P3'. Below these are eight input fields for colorimetry data: 'Red x[2]' (0.68000), 'Red y[2]' (0.32000), 'Green x[0]' (0.26500), 'Green y[0]' (0.69000), 'Blue x[1]' (0.15000), 'Blue y[1]' (0.06000), 'White Point x' (0.32120), and 'White Point y' (0.32900). Below these fields is another 'Presets' section with a 'Factory Settings' button. At the bottom of the section are four more input fields: 'Display Mastering Lum Min' (0.0005), 'Display Mastering Lum Max' (1000), 'Max CLL' (1000), and 'Max FALL' (400).

Click on the HDR Metadata tab to view and, if necessary, make changes to the OG-Hi5-4K-Plus High Dynamic Range metadata. For SDI, this metadata defines the VPID (Video Payload Identifier) for Transfer Characteristic and Colorimetry. For HDMI, it defines the EOTF and Colorimetry and sets parameters for the Dynamic Range and Mastering infoframes. The HDR metadata is a mechanism to inform an HDMI sink device (such as a TV or monitor) that the video content is HDR encoded.

NOTE: *HDR Metadata values do not modify video image data. They define the HDR metadata included in the video output.*

For most workflows the Auto settings for the Output Overrides parameters are appropriate, which will automatically pass incoming HDR metadata, if present, through to the output. However, this metadata may need to be edited for a specific workflow, or to correct inaccurate incoming metadata.

Output Overrides

The override controls on the right can be used to replace incoming or missing HDR metadata with alternative values for the OG-Hi5-4K-Plus's HDMI output.

SDR/HDR

This setting controls what SDR/HDR metadata value is applied to the video output.

- Auto - Passes the SDR/HDR value from the video input to the output.
- SDR - An SDR value is applied to the output.
- PQ - A PQ value is applied to the output.
- HLG - An HLG value is applied to the output.

Colorimetry

This setting controls what Colorimetry metadata value is applied to the video output.

- Auto - Passes the Colorimetry value from the video input to the output.
 - BT.601, BT.709 and BT.2020 values are passed through.
 - If a non-supported colorimetry value is received, then BT.601 is signaled for SD formats and BT.709 is signaled for HD/UltraHD formats.
- BT.709 - A BT.709 value is applied to the output.
- BT.2020 - A BT.2020 value is applied to the output.

HDMI Metadata

This setting can be used to insert custom metadata values in the HDMI HDR Infoframe.

- Auto - The 8 RGB vertices/white point parameters that get inserted into the HDMI HDR Infoframe are automatically generated:
 - If the incoming Colorimetry value is BT.709, Color VANC Packet, or Unknown, then BT.709 values are passed to the outputs.
 - If the incoming Colorimetry value is BT.2020, BT.2020 values are passed to the outputs.
- Custom - The 8 RGB vertices/white point parameters defined on the left side of the screen are applied to the outputs.

NOTE: The four mastering parameters (Max CLL, etc) set in DashBoard are always inserted into the HDMI HDR Infoframe, although HDMI HDR Infoframes are only generated if the SDR/HDR value is PQ or HLG.

Custom HDMI Metadata

The twelve Custom HDMI Metadata parameters in the lower part of the HDR Metadata tab can be used to define HDR color, white point, and luminance values.

*NOTE: These settings are only applied when the HDMI Metadata parameter is set to **Custom**. These values can be changed at any time (even with **Auto** selected), in which case those values will only be applied after selecting **Custom**.*

Presets

For user convenience, the eight top values (RGB vertices and white point) can be preset to default **BT.709**, default **BT.2020** or default **DCI-P3** values.

Red, Green, Blue, White Point

These eight values define the color gamut and white point, and are adjustable in units of 0.00002 cd/m^2 , with a range of 0.00000 to 1.00000 cd/m^2 .

Presets – Factory Settings

Click **Factory Settings** to restore the DM Lum (min, max), Maximum CLL and Maximum FALL HDR Metadata settings to their factory default settings.

Display Mastering Lum Min/Max

These two parameters define the Display Mastering Luminance.

- Minimum: Defines the floor of the SMPTE ST 2086 color volume (in the case of HDR) and is determined by the mastering environment.
 - Range: 0.00000 cd/m^2 to 1.00000 cd/m^2 .
 - Step size: 0.00002 cd/m^2 .
- Maximum: Defines the ceiling of the SMPTE ST 2086 color volume (in the case of HDR) and is determined by the mastering environment.
 - Range: 1 cd/m^2 to 65535 cd/m^2 .
 - Step size: 1 cd/m^2 .

Maximum: CLL

Represents the highest-value pixel component in an entire scene. It is determined by analyzing each frame of video, and can be determined in the post environment.

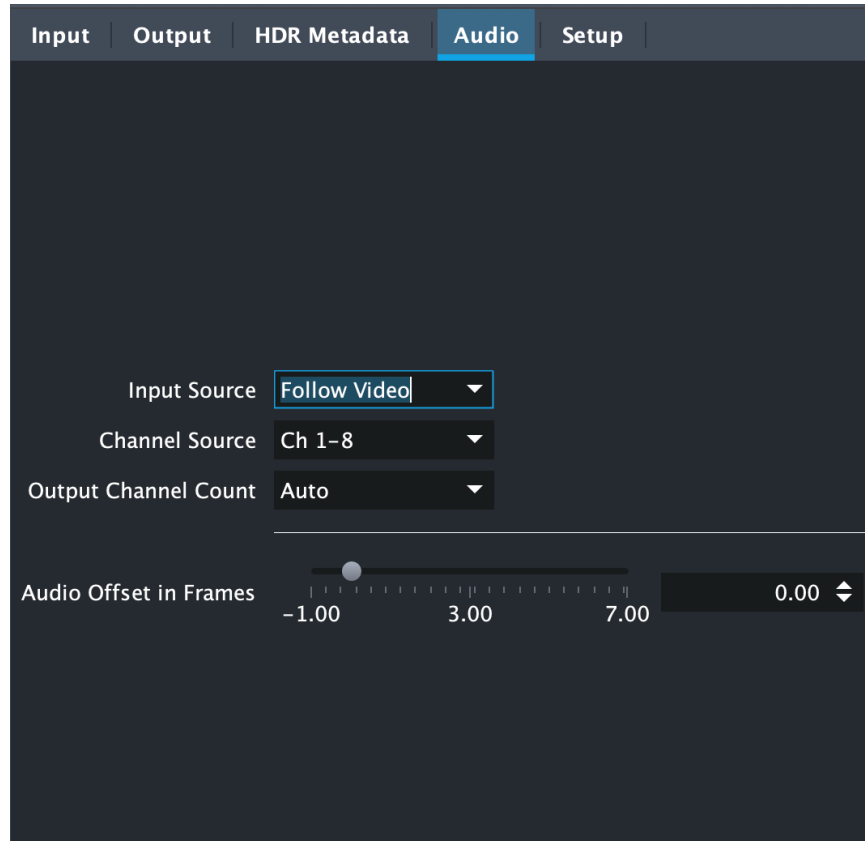
- Range: 1 cd/m^2 to 65535 cd/m^2 .
- Step size: 1 cd/m^2 .

Maximum: FALL

Represents the maximum of frame-based average light levels taken over an entire scene, and can be determined in the post environment.

- Range: 1 cd/m^2 to 65535 cd/m^2 .
- Step size: 1 cd/m^2 .

Audio Tab Screen



Click on the Audio tab to view and make changes to the OG-Hi5-4K-Plus audio settings.

NOTE: When using the DVI video protocol, no audio is output since that protocol is video only.

Input Source

Choose Follow Video, SDI 1, SDI 2, SDI 3, or SDI 4.

Channel Source

Choose which embedded audio channels are routed to the HDMI output. Eight channels are routed at a time. You can choose Ch 1-8 or Ch 9-16 from any of the SDI inputs.

Output Channel Count

Choose Auto, 2 of 8 Channels, or 8 Channels embedded audio. Choosing "Auto" automatically selects the audio channels based on the attached device's capabilities.

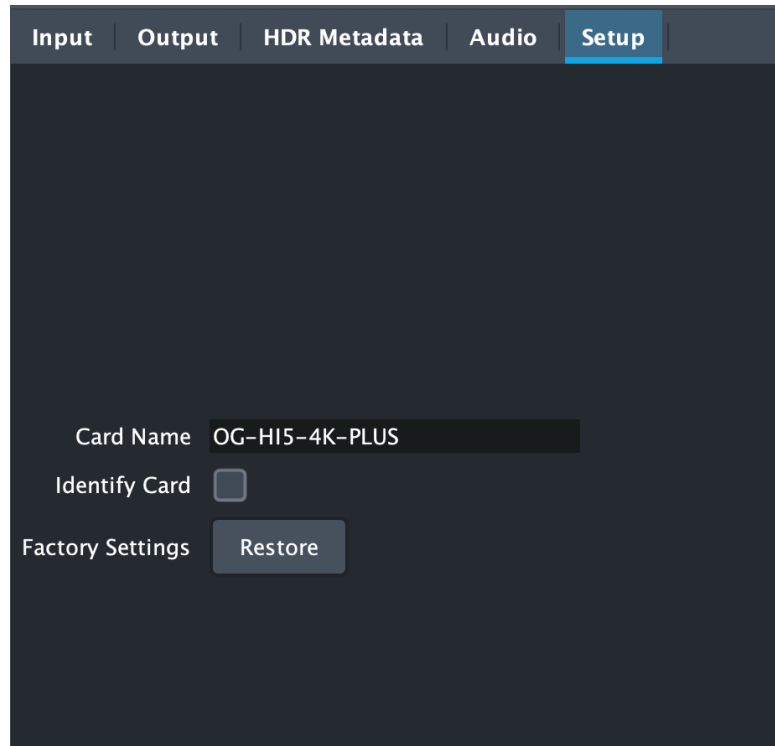
Audio Offset In Frames

Permits time shifting the embedded audio in relationship to the video (for example, to correct for lip sync problems), in 1/16 of a frame increments. Range is from -0.8125 video frame to +7.0 video frames. The actual time duration of delay will vary depending on the frame rate of the format being converted.

Setup Tab Screen

Click on the Setup tab to view and make changes to the card name or to restore card settings to factory default values.

Figure 14. OG-Hi5-4K-Plus Setup Tab Screen in DashBoard



Card Name

By default, this field is pre-populated with the card name OG-Hi5-4K-Plus. You can change the card name by editing the text in the Card Name field.

Identify Card

When checked, the power LED on the card blinks orange so it can easily be identified for service.

Factory Settings

If you would like to revert the card settings to factory default values, click **Restore**.

Uploading New Software

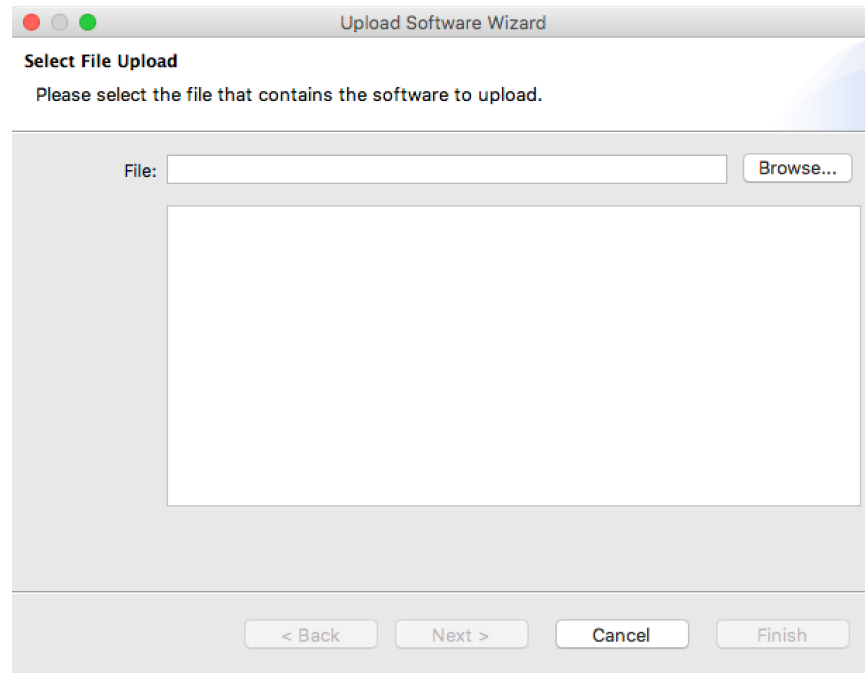
When available, you can upload updated software to the OG-Hi5-4K-Plus through the DashBoard Control System by following the steps below.

To Upload New Software

1. Check the AJA website for new software for your OG-Hi5-4K-Plus. 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.

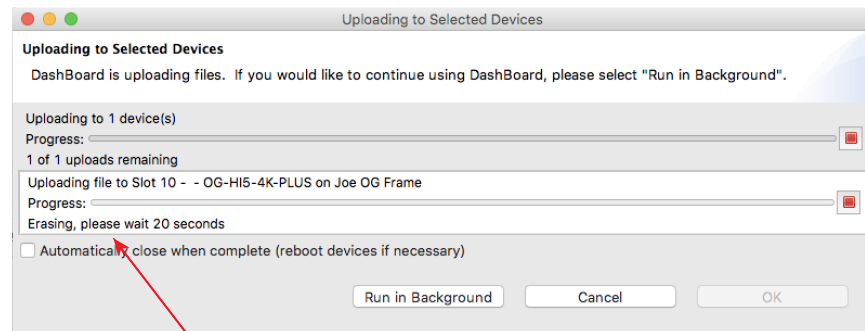
Figure 15. OG-Hi5-4K-Plus Upload Software Wizard window in DashBoard



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**.

NOTE: Before the upload begins, DashBoard will erase the firmware on the card, taking approximately 20 seconds.

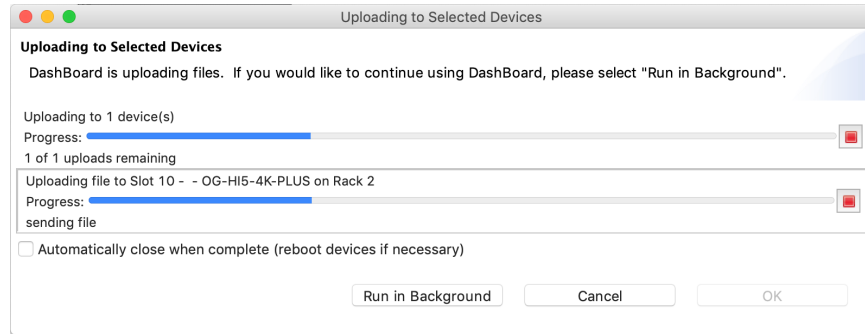
Figure 16. Note the message "Erasing, please wait 20 seconds"



For the first 20 seconds,
DashBoard is erasing the
card's firmware.

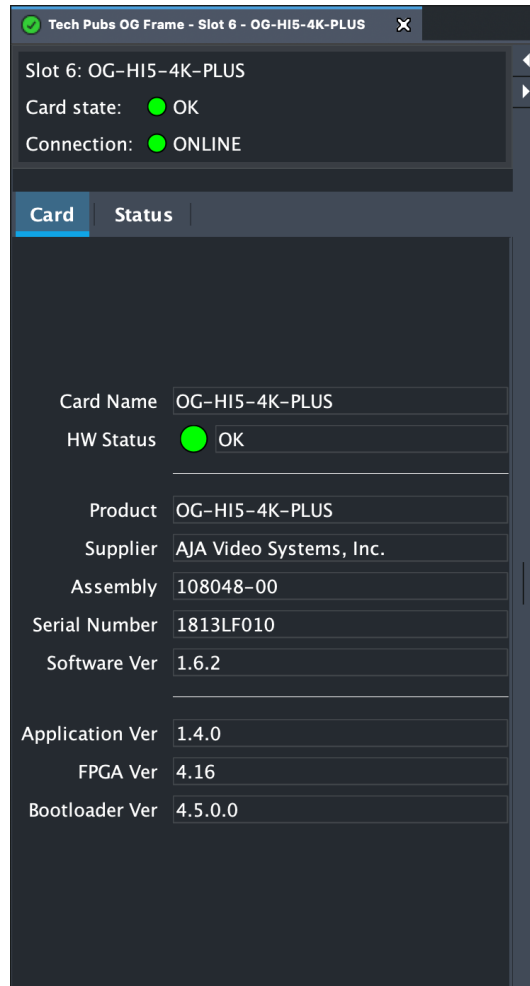
After the erasing process has completed, the upload will begin, shown in the Uploading to Selected Devices window below.

Figure 17. OG-Hi5-4K-Plus 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 18. OG-Hi5-4K-Plus 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-Hi5-4K-Plus

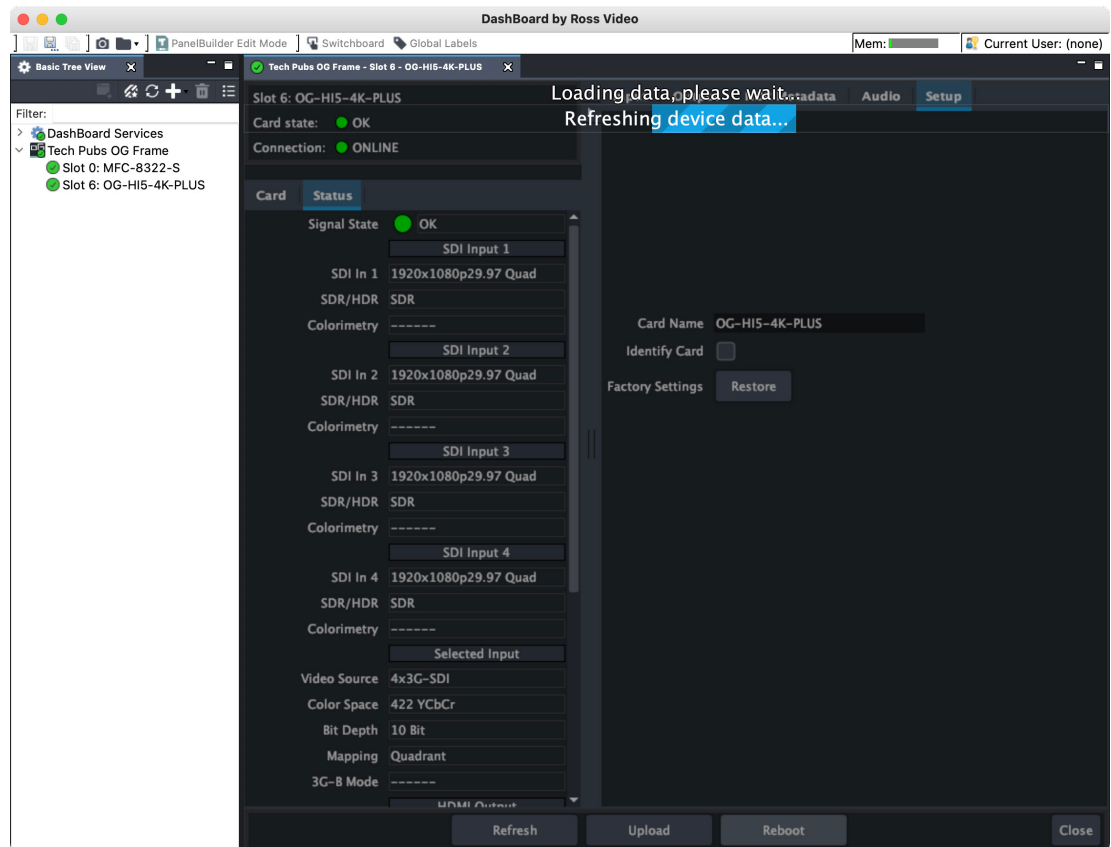
1. Click the Reboot button in the lower panel of DashBoard. The reboot confirmation message displays.

Figure 19. 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 20. The OG-Hi5-4K-Plus 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

OG-Hi5-4K-Plus Tech Specs

Video Formats

- (4K) 4096 x 2160p
- (UltraHD) 3840 x 2160p
- (2K) 2048 x 1080p
- (HD) 1920 x 1080p
- (HD) 1920 x 1080i
- (HD) 1280 x 720p
- (SD) 720 x 576i
- (SD) 720 x 480i

Note: Raster and Frame Rate Dependent, please see OG-Hi5-4K-Plus Video Formats in Documents and Manual.

Video Input Digital

- 4x 3G-SDI BNC, SMPTE-259/292/424
 - YCbCr 4:2:2/4:4:4
 - RGB 4:4:4, SMPTE or Full level
 - 8, 10, or 12-bit
 - Two Sample Interleave (2SI) or Square Division (Quadrant) pixel mapping
- 4x 3 Gb SDI (Level A or B Dual Link)
 - (4K) 4096 x 2160p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
 - (4K) 4096 x 2160PsF* 23.98, 24, 25, 29.97, 30
 - (UltraHD) 3840 x 2160p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
 - (Ultra HD) 3840 x 2160PsF* 23.98, 24, 25, 29.97, 30
- 4x 1.5 Gb SDI
 - (4K) 4096 x 2160p 23.98, 24, 25, 29.97, 30
 - (4K) 4096 x 2160PsF 23.98, 24, 25, 29.97, 30
 - (UltraHD) 3840 x 2160p 23.98, 24, 25, 29.97, 30
 - (UltraHD) 3840 x 2160PsF 23.98, 24, 25, 29.97, 30
- 2x 3 Gb SDI (Level B Dual Stream)
 - (4K) 4096 x 2160p 23.98, 24, 25, 29.97, 30
 - (4K) 4096 x 2160PsF 23.98, 24, 25, 29.97, 30
 - (UltraHD) 3840 x 2160p 23.98, 24, 25, 29.97, 30
 - (UltraHD) 3840 x 2160PsF 23.98, 24, 25, 29.97, 30
- 1x 3 Gb SDI (Level A or B Dual Link)
 - (2K) 2048 x 1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
 - (2K) 2048 x 1080PsF 23.98, 24, 25, 29.97, 30
 - (HD) 1920 x 1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
 - (HD) 1920 x 1080PsF 23.98, 24, 25, 29.97, 30
 - (HD) 1920 x 1080i 50, 59.94, 60
 - (HD) 1280 x 720p** 50, 59.94, 60
- 2x 1.5 Gb SDI (Dual Link HD-SDI), SMPTE-372
 - (HD) 1920 x 1080p 50, 59.94, 60

- 1x 1.5 Gb SDI
 - (2K) 2048 x 1080p 23.98, 24, 25, 29.97, 30
 - (2K) 2048 x 1080PsF 23.98, 24, 25, 29.97, 30
 - (HD) 1920 x 1080p 23.98, 24, 25, 29.97, 30
 - (HD) 1920 x 1080PsF 23.98, 24, 25, 29.97, 30
 - (HD) 1920 x 1080i 50, 59.94, 60
 - (HD) 1280 x 720p 50, 59.94, 60
- 1x 270 Mb SDI
 - (SD) 625i 50
 - (SD) 525i 59.94

*PsF is Level B Dual Link

**1280 x 720p is Level A Only

Video Output Digital

- 1 x HDMI Type A connector*, HDMI v2.0b
- HDR infoframe generation with pass-through or override for Colorimetry and Transfer Characteristic
- YCbCr 4:2:2/4:4:4/4:2:0
- RGB 4:4:4, SMPTE or Full level
- 8, 10, or 12-bit (HFR 4K/UltraHD 4:4:4 limited to 8 bit)
- (4K) 4096 x 2160p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- (UltraHD) 3840 x 2160p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- (2K) 2048 x 1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- (HD) 1920 x 1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- (HD) 1920 x 1080i 50, 59.94, 60
- (HD) 1280 x 720p 50, 59.94, 60
- (SD) 720 x 576i 50
- (SD) 720 x 480i 59.94

*If a connected monitor doesn't support HDMI protocol the unit automatically switches to DVI protocol (which does not pass audio)

Audio Pass-Through Formats

- PCM
- Dolby Digital (AC-3)
- Dolby Digital Plus (E-AC-3), including Atmos Immersive Sound (JOC)
- Audio Input Digital
- SDI embedded audio, 24-bit (SD limited to 20-bit), 16-channel
- Audio Output Digital
- HDMI embedded audio, 24-bit, 8-channel
- 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, 12.0 watts max per card

Environment

- 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-Hi5-4K-Plus Video Formats

Video Input - 4K/UltraHD, HD, and SD, 4x BNC

4K/UltraHD Inputs Supported

4x 3G-SDI:

<i>Format</i>	<i>Frame Rate</i>	<i>Color Space</i>	<i>Sampling</i>	<i>Bit Depth</i>	<i>Level A/B</i>	<i>Pixel Mapping</i>
4096x2160p	50, 59.94, 60	YCbCr	4:2:2	10	A or B DL	SQD/2SI
4096x2160p	23.98, 24, 25, 29.97, 30	YCbCr/RGB	4:4:4	10, 12	A or B DL	SQD/2SI
4096x2160PsF	23.98, 24, 25, 29.97, 30	YCbCr/RGB	4:4:4	10	B DL	SQD
3840x2160p	50, 59.94, 60	YCbCr	4:2:2	10	A or B DL	SQD/2SI
3840x2160p	23.98, 24, 25, 29.97, 30	YCbCr/RGB	4:4:4	10, 12	A or B DL	SQD/2SI
3840x2160PsF	23.98, 24, 25, 29.97, 30	YCbCr/RGB	4:4:4	10	B DL	SQD

2x 3G-SDI:

<i>Format</i>	<i>Frame Rate</i>	<i>Color Space</i>	<i>Sampling</i>	<i>Bit Depth</i>	<i>Level A/B</i>	<i>Pixel Mapping</i>
4096x2160p	23.98, 24, 25, 29.97, 30	YCbCr	4:2:2	10	B DS	SQD/2SI
4096x2160PsF	23.98, 24, 25, 29.97, 30	YCbCr	4:2:2	10	B DS	SQD
3840x2160p	23.98, 24, 25, 29.97, 30	YCbCr	4:2:2	10	B DS	SQD/2SI
3840x2160PsF	23.98, 24, 25, 29.97, 30	YCbCr	4:2:2	10	B DS	SQD

4x 1.5G-SDI:

<i>Format</i>	<i>Frame Rate</i>	<i>Color Space</i>	<i>Sampling</i>	<i>Bit Depth</i>
4096x2160p	23.98, 24, 25, 29.97, 30	YCbCr	4:2:2	10, 12
4096x2160PsF	23.98, 24, 25, 29.97, 30	YCbCr	4:2:2	10
3840x2160p	23.98, 24, 25, 29.97, 30	YCbCr	4:2:2	10, 12
3840x2160PsF	23.98, 24, 25, 29.97, 30	YCbCr	4:2:2	10

2K/HD Inputs Supported

1x 3G-SDI:

<i>Format</i>	<i>Frame Rate</i>	<i>Color Space</i>	<i>Sampling</i>	<i>Bit Depth</i>	<i>Level A/B</i>
2048x1080p	50, 59.94, 60	YCbCr	4:2:2	10	A or B DL
2048x1080p	23.98, 24, 25, 29.97, 30	YCbCr/RGB	4:4:4	10, 12	A or B DL
2048x1080PsF	23.98, 24, 25, 29.97, 30	YCbCr/RGB	4:4:4	10, 12	A or B DL
1920x1080p	50, 59.94, 60	YCbCr	4:2:2	10	A or B DL
1920x1080p	23.98, 24, 25, 29.97, 30	YCbCr/RGB	4:4:4	10, 12	A or B DL
1920x1080PsF	23.98, 24, 25, 29.97, 30	YCbCr/RGB	4:4:4	10, 12	A or B DL
1920x1080i	50, 59.94, 60	YCbCr/RGB	4:4:4	10, 12	A or B DL
1280x720p	50, 59.94, 60	YCbCr/RGB	4:4:4	10	A

2x 1.5G-SDI:

<i>Format</i>	<i>Frame Rate</i>	<i>Color Space</i>	<i>Sampling</i>	<i>Bit Depth</i>
1920x1080p	50, 59.94, 60	YCbCr	4:2:2	10

1x 1.5G-SDI:

<i>Format</i>	<i>Frame Rate</i>	<i>Color Space</i>	<i>Sampling</i>	<i>Bit Depth</i>
2048x1080p	23.98, 24, 25, 29.97, 30	YCbCr	4:2:2	10
2048x1080PsF	23.98, 24, 25, 29.97, 30	YCbCr	4:2:2	10
1920x1080p	23.98, 24, 25, 29.97, 30	YCbCr	4:2:2	10
1920x1080PsF	23.98, 24, 25, 29.97, 30	CbCr	4:2:2	10
1920x1080i	50, 59.94, 60	YCbCr	4:2:2	10
1280x720p	50, 59.94, 60	YCbCr	4:2:2	10

SD Inputs Supported

1x SD-SDI:

<i>Format</i>	<i>Frame Rate</i>	<i>Color Space</i>	<i>Sampling</i>	<i>Bit Depth</i>
625i	50	YCbCr	4:2:2	10
525i	59.94	YCbCr	4:2:2	10

Video Output - 4K/UltraHD, HD, and SD, 1x HDMI

4K/UltraHD Outputs Supported

<i>Format</i>	<i>Frame Rate</i>	<i>Color Space</i>	<i>Sampling</i>	<i>Bit Depth</i>
4096x2160p	50, 59.94, 60	YCbCr	4:2:0	8, 10, 12
4096x2160p	50, 59.94, 60	YCbCr/RGB	4:4:4	8
4096x2160p	23.98, 24, 25, 29.97, 30, 50, 59.94, 60	YCbCr	4:2:2	8, 10, 12
4096x2160p	23.98, 24, 25, 29.97, 30	YCbCr/RGB	4:4:4	8, 10, 12
3840x2160p	50, 59.94, 60	YCbCr	4:2:0	8, 10, 12
3840x2160p	50, 59.94, 60	YCbCr/RGB	4:4:4	8
3840x2160p	23.98, 24, 25, 29.97, 30, 50, 59.94, 60	YCbCr	4:2:2	8, 10, 12
3840x2160p	23.98, 24, 25, 29.97, 30	YCbCr/RGB	4:4:4	8, 10, 12

2K/HD Outputs Supported

<i>Format</i>	<i>Frame Rate</i>	<i>Color Space</i>	<i>Sampling</i>	<i>Bit Depth</i>
2048x1080p	23.98, 24, 25, 29.97, 30, 50, 59.94, 60	YCbCr	4:2:2	8, 10, 12
2048x1080p	23.98, 24, 25, 29.97, 30, 50, 59.94, 60	YCbCr/RGB	4:4:4	8, 10, 12
1920x1080p	23.98, 24, 25, 29.97, 30, 50, 59.94, 60	YCbCr	4:2:2	8, 10, 12
1920x1080p	23.98, 24, 25, 29.97, 30, 50, 59.94, 60	YCbCr/RGB	4:4:4	8, 10, 12
1920x1080i	50, 59.94, 60	YCbCr	4:2:2	8, 10, 12
1920x1080i	50, 59.94, 60	YCbCr/RGB	4:4:4	8, 10, 12
1280x720p	50, 59.94, 60	YCbCr	4:2:2	8, 10, 12
1280x720p	50, 59.94, 60	YCbCr/RGB	4:4:4	8, 10, 12

SD Outputs Supported

<i>Format</i>	<i>Frame Rate</i>	<i>Color Space</i>	<i>Sampling</i>	<i>Bit Depth</i>
576i	50	YCbCr	4:2:2	8, 10
576i	50	YCbCr/RGB	4:4:4	8, 10
480i	59.94	YCbCr	4:2:2	8, 10
480i	59.94	YCbCr/RGB	4:4:4	8, 10

Appendix B – Safety and Compliance

Federal Communications Commission (FCC) Compliance Notices

Class A Interference Statement

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

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

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

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, LICHTEINSTEIN, 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 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: 2004 + A1:2010, EN 61000-4-5:2006, EN 61000-4-6:2009,
EN 61000-4-11:2004

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! 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 éclaircies 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! 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! 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.



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.



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.



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.



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.



Warning! Ensure Mains Power is disconnected before installing the OG-Hi5-4K-Plus 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-Hi5-4K-Plus 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-Hi5-4K-Plus 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-Hi5-4K-Plus 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-Hi5-4K-Plus 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-Hi5-4K-Plus 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.

Five Year Warranty

Limited Warranty on Hardware

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

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

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.

Index

Symbols

- 3G-B Mode 20
- 4K/2K Crop setting 22
- 4K Dual-Stream 3Gb SDI Inputs 5
- 4K x 2160 Output 6
- 3840 x 2160 Output 6

A

- AJA Support 2
- Audio Follow Video 26
- Audio Input Source setting 26
- Audio Offset in Frames setting 26
- Audio Tab Screen 26

B

- Bit Depth Input setting 20
- Bit Depth Output setting 21

C

- Card Name 27
- Card Tab Screen 17
- Channel Source 26
- CLL
 - Maximum 25
- Colorimetry HDMI Output Override 24
- Color Space setting 20, 21
- Configuration Settings
 - Stored in OG cards 15
- Custom HDMI Metadata 24

D

- DashBoard Control System 10
 - Audio Tab Screen 26
 - Card Tab Screen 17
 - Control Interface Basic Components 15
 - Documentation 15
 - Downloading 15
 - HDR Metadata Tab Screen 23
 - Input Tab Screen 19
 - Output Tab Screen 21
 - Rebooting 30
 - Requirements 15
 - Setup Tab Screen 27
 - Status Tab Screen 18
 - Uploading New Software 27
 - Using 15
- Default Operation 5
- Diagram
 - Simplified Block 6
- DM Lum 25
- Dual-Link 1.5 Gb HD Inputs 5
- Dual-Stream 4K 3Gb SDI Inputs 5

F

- Factory Settings 27
- FALL
 - Maximum 25
- Features 6

H

- HDMI 1.4/2.0 22
- HDMI/DVI Output setting 22
- HDMI Metadata Output Override 24
- HDR Metadata Presets 24
- HDR Metadata Tab Screen 23
- HD Single Inputs 5

I

- Identify Card 27
- Input Tab Screen 19
- Installation 11
 - Cabling 14
 - Front Card Installation 12
 - Rear Card Installation 11
- I/O Connections 7

M

- Mapping
 - 2SI 20
 - Input Tab Screen 20
- Maximum: CLL 25
- Maximum: FALL 25

O

- openGear and AJA 11
- Output Channel Count
 - Audio Tab Screen 26
- Output Overrides 24
- Output Tab Screen 21
- Overview 5

P

- Presets
 - HDR Metadata Factory Settings 25
- Presets – BT.709, BT.2020, DCI-P3 24

R

- Red, Green, Blue, White Point 25
- RGB Range setting
 - Input Tab Screen 20
 - Output Tab Screen 21

S

- SDR/HDR HDMI Output Overrides 24
- SD Single Inputs 5
- Setup Tab Screen 27
- Signal Conversion Requirement

- Valid SDI Video Signal 5
- Signal Indicators
 - DashBoard Control System 8
 - LED Lights on Card 7
- Status Tab Screen 18

T

- Technical Support 2

U

- User Controls 10

V

- Video Format setting
 - Input Tab Screen 20
- Video Source setting
 - Input Tab Screen 19

W

- Warranty 45