

# OG-X-FR

openGear Frame



## Installation and Operation Guide

Version 1.0r3  
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# Chapter 1 – Introduction

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This guide covers the installation and use of the OG-X-FR openGear High Density Modular Frame. The following chapters are included:

- **Introduction** summarizes the guide and provides important terms, and conventions.
- **Before You Begin** provides general information to keep in mind before installing and configuring your OG-X-FR.
- **Hardware Overview** provides a basic introduction to the OG-X-FR hardware features.
- **Physical Installation** provides instructions for the physical installation of the OG-X-FR.
- **Ethernet Cabling** provides an overview of connecting input and output devices to the OG-X-FR.
- **Reference Cabling** provides an overview of the reference distribution and how to connect a reference source to the OG-X-FR.
- **MFC-8322-S Network Card** provides instructions for installing and configuring the MFC-8322-S network controller card.
- **Using Dashboard** outlines the Diagnostic Panel features and displaying the OG-X-FR in Dashboard.
- **Maintenance** provides instructions for cleaning the fan filter and replacing a failed Cooling Fan Module.
- **Technical Specifications** provides the specifications for the OG-X-FR.
- **Service Information** provides information on the warranty and repair policy for your OG-X-FR.
- **Glossary** provides a list of terms used throughout this guide.

## Related Publications

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It is recommended to consult the following Ross documentation before installing and configuring your OG-X-FR:

- ***DashBoard User Manual***, Ross Part Number: 8351DR-004
- ***MFC-OGX-N and MFC-8322-S User Guide***, Ross Part Number: 8322DR-004-05

## Documentation Conventions

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

### Interface Elements

---

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

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

### User Entered Text

---

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

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

## Referenced Guides

---

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

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

## Menu Sequences

---

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

# Chapter 2 – Before You Begin

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If you have questions pertaining to the operation of OG-X-FR, please contact us at the numbers listed in the section "[Contacting AJA Technical Support or Sales](#)" on page 2. Our technical staff is always available for consultation, training, or service.

*NOTE: The terms MFC-OGX-N and MFC-OG3-N may be used interchangeably at various points in this manual. They refer to the same model of network controller card.*

## Overview

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The OG-X-FR frame offers the flexibility of independent rear modules for connectivity to a wide array of interfaces such as BNC, twisted-pair audio, and fiber. Each frame offers a full rear module that accommodates one card each, or a high density split rear module that accommodates two cards each. Using the split rear module allows for up to 20 independent openGear solutions to be installed.

*NOTE: Cards and rear modules designed for the DFR-8321 frames are also supported by the OG-X-FR frames. However, some cards and rear modules may be designed specifically for the OG-X-FR frames only. Refer to the documentation for your openGear card for details on the frames you can use.*

## Features

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The OG-X-FR frame includes the following features:

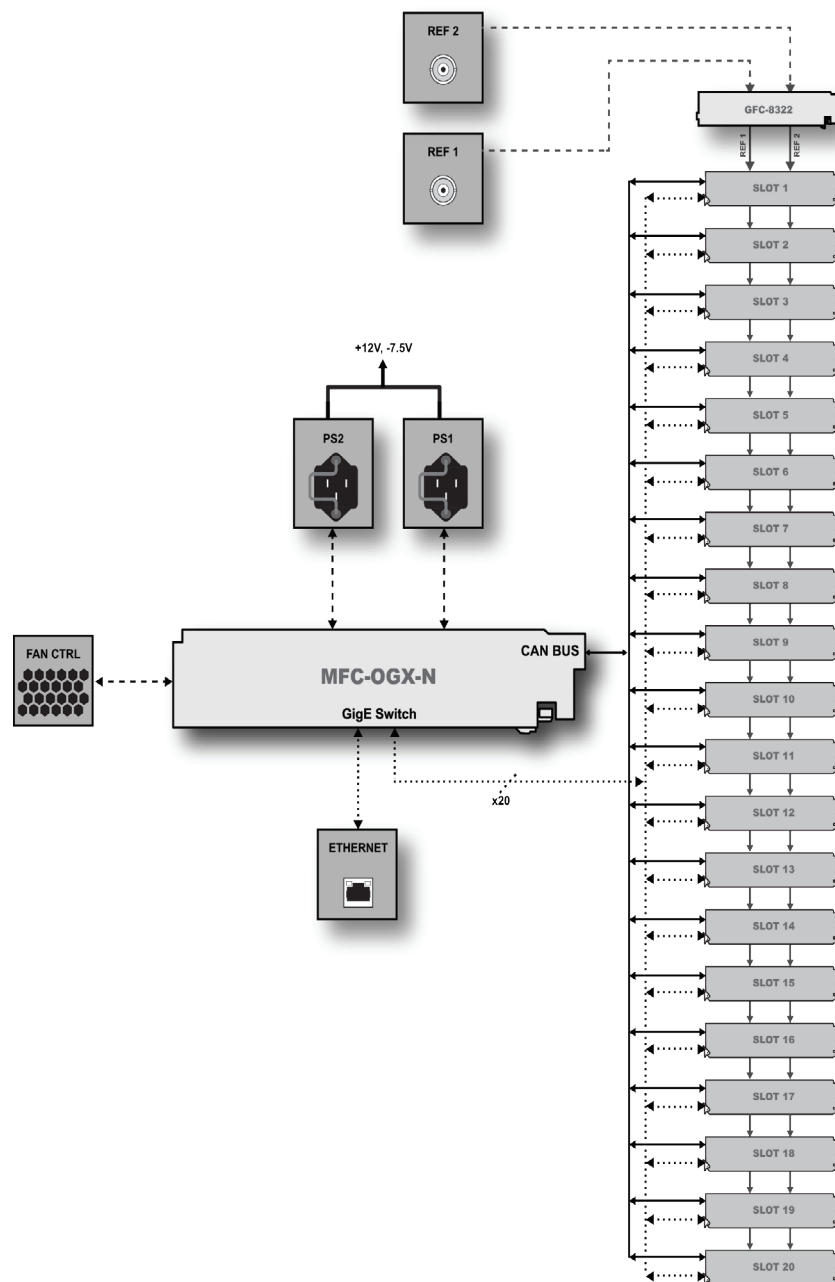
- Two independent looping reference inputs feed all card slots
- Can house any mix of analog, digital, video and audio cards in the same frame
- Available with individual card specific modules for connector flexibility
- Optional redundant power supply is hot-swappable for 24/7 operation
- Power switch is accessible from front of the rack frame
- Power supplies are replaceable from the front of the frame without requiring rear-frame access
- Separate power cords to each supply for power feed redundancy
- PowerLock cord retainer mechanism guards against accidental power loss
- Durable powder-coat paint finish
- Removable hinged front door for easy card insertion and removal, and flexibility in servicing the cooling fans
- Aluminum and steel construction to reduce weight and increase strength
- 2RU frame houses up to 20 cards
- Robust 500W power supply with two integral cooling fans per power supply
- Comes standard with the Cooling Fan Module for increased ventilation and enhanced reliability
- Supports Gigabit Ethernet (GigE) connectivity to each openGear card in the frame (requires the MFC-OGX-N Network Controller Card)
- Provides a system alarm LED on the frame front door
- Provides an LCD Diagnostic Panel on frame front that reports the frame name, and IP address; provides the ability to scroll through these reported error conditions
- Removable door with durable powder-coat paint finish
- 5-year warranty

# Workflow

The OG-X-FR frame comes standard with Ethernet connectivity for basic configuration and monitoring of openGear® cards through the DashBoard control system. An optional advanced networking card, the MFC-OGX-N, adds an on-board GigE switch, with GigE access to each of the 20 processing card slots.

**NOTE:** Gigabit Ethernet is only available with the MFC-OGX-N installed in the OG-X-FR frame.

Figure 1. Workflow of the OG-X-FR





# Chapter 3 – Hardware Overview

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Your OG-X-FR frame is a 2RU modular frame, designed to accommodate openGear cards. A complete list of available openGear cards is available on our website.

## Front Panel Overview

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This section briefly summarizes the features of the OG-X-FR front panel.

*Figure 2. OG-X-FR Front Panel*



### 1. Diagnostic Panel

The Diagnostic Panel is located on the frame front panel and enables you to quickly monitor the frame. Information is presented in two separate lines of text:

- The top line in the display cycles through the name assigned to the frame in DashBoard and the current IP address of the frame (or 0.0.0.0 if none available). The IP address is configured on the MFC-OGX-N Network Controller Card. Refer to the user guide for your card to learn more about setting the IP address and frame name in DashBoard.
- The second line reports errors or alarm conditions from any source. This includes fan failure alarms, power supply warnings, or errors reported by the cards installed in the frame. The Diagnostic Panel organizes the messages starting with the most recent at the top of the list. Refer to the user guide for your openGear card to learn more about the types of error conditions that your card reports.

### 2. Toggle Button

The **Toggle** button is located directly to the left of the Diagnostic Panel and enables you to mute the audio alarm, or quickly scroll through the error messages reported on the second line of the Diagnostic Panel.

- Pressing the **Toggle** button once mutes the audio alarm.
- Pressing the **Toggle** button multiple times scrolls through the messages.

*NOTE: If you are scrolling through the list and a new error condition is reported, the list is automatically updated and returns you to the beginning of the list.*

### 3. Door Tabs

These tabs enable you to open the frame door and gain access to the interior of the frame. An alarm is raised when the frame door is opened longer than 5 minutes.

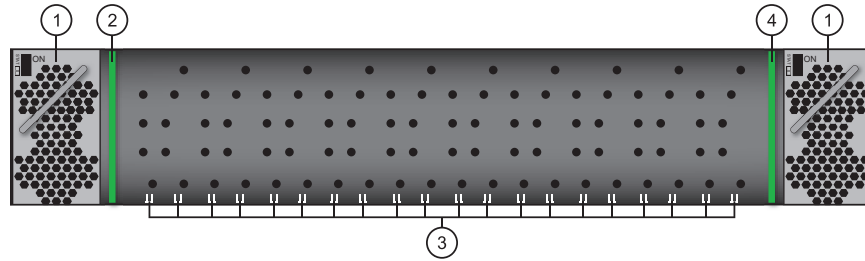
### 4. Frame Glow

This feature is a user-programmable frame glow that can be configured to glow a preset color, or customized colors to indicate different alarms. This is also useful when trying to locate the frame within a rack room. Refer to the **MFC-OG3-N and MFC-8322-S User Guide** for details on configuring this feature.

## OG-X-FR Interior

This section briefly summarizes the features of the interior of the OG-X-FR chassis.

*Figure 3. OG-X-FR — Interior Features with Door Removed*



### 1. Power Supplies

The OG-X-FR frame can accommodate two front-loaded power supplies. However, each frame comes standard with one power supply (the power supply on the left in Figure 3). Although a single power supply can fully power a loaded frame, the addition of a second (optional) power supply gives the frame full power redundancy. Each power supply is fed by a separate power cord, which is held in position to guard against accidental power loss.

### 2. GFC-8322

The GFC-8322 comes pre-installed in the designated slot immediately to the right of Power Supply 1 (PS1), and is secured with a metal retaining latch. Its primary function is to distribute the reference signals to openGear cards installed in the frame. Refer to the section ["GFC-8322 Overview" on page 20](#) for more information.

### 3. Card Slots

There are a total of 20 card slots in the OG-X-FR chassis and are used to install openGear cards into the chassis. Depending on the card model and rear module you are using, multiple slots may be required. Refer to the user guide for your openGear card for installation details for your card.

### 4. Controller Card

There are two models of Controller Card: MFC-8322-S and the MFC-OGX-N. The Controller Card comes pre-installed in the OG-X-FR frame. You must have the MFC-OGX-N installed in the OG-X-FR frame to take advantage of the GigE connectivity available for openGear cards in the frame. Refer to the **MFC-OGX-N User Guide** for more information.

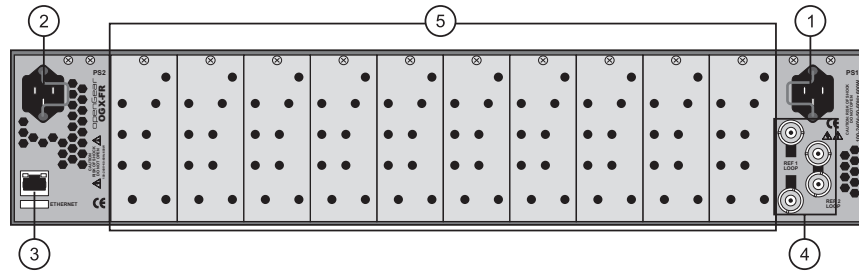
### 5. Mounted Fans (not shown)

The OG-X-FR frames were designed with front-door mounted fans to provide forced air cooling for all cards, and additional cooling for the power supplies. An intelligent fan controller adjusts fan speed with changes in frame power loading. Particular attention has been paid to frame acoustics in order to keep fan noise to a minimum.

## Rear Panel Overview

This section briefly summarizes the features of the OG-X-FR rear panel.

Figure 4. OG-X-FR — Rear Panel



1. PS1 Power Supply Connector

This connector is the AC Connector for the main power supply. Refer to the section ["Connecting to a Power Supply" on page 16](#) for more information.

2. PS2 Power Supply Connector

This connector is the AC Connector for the optional redundant power supply.

3. ETHERNET Communication Port

The Ethernet port is an RJ45 connector is used to connect the optional Network Controller card to an external Ethernet network. This Network Controller card is required to bridge the external Ethernet network to the local communication bus for monitoring and control of cards installed in the frame. Only cards with the Communication bus interface will be able to be monitored and controlled this way.

**NOTE:** The Ethernet port does not provide Power-over-Ethernet (PoE).

4. REF Connectors

Two sets of looping BNC inputs are provided to accept two independent reference signals supporting the following reference signal types: Analog black, Tri-level sync, and AES/DARS reference.

5. Rear Modules for openGear Cards

The OG-X-FR frame supports module-dependent rear modules. Rear modules can be ordered with cards, and are easy and quick to install. Blank plates must be installed if the slots are not populated with openGear cards and rear modules.

## openGear Rear Modules

If your OG-X-FR frame was ordered with cards requiring full rear modules or split rear modules, the appropriate modules are installed at the factory or included with the cards.

### Supports DFR-8321 and OG3-FR Rear Modules

The OG-X-FR frame supports all existing rear modules designed for the DFR-8321 and OG3-FR frames. However, rear modules designed for use in the OG-X-FR frame are not compatible with other openGear frames.

### Identifying an OG-X-FR Rear Module

There are two ways to identify an OG-X-FR frame rear module:

- the notched top of the rear module, and
- a small notch on the bottom left corner of the rear module that fits into a second seating slot on the midplane of the OG-X-FR frames. Note that this small notch is not present on other frame rear module types.



**Caution!** Attempting to install an OG-X-FR frame rear module into an OG3-FR, DFR-8321, DFR-8320, or DFR-8310 frame can damage the rear module.

## Rear Module Types

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This section provides an overview of the rear module types for your OG-X-FR frame.

### Full Rear Modules

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The full rear modules features a single card connector and can include a combination of BNC, WECO™, fiber optic, serial, and ethernet connectors. Each module occupies two slots in the frame and accommodates one card. Ensure the openGear card is installed in the correct slot in the OG-X-FR frame. Up to 10 cards can be installed in a frame when using these modules.

### Split Rear Modules

---

Much like the modules for the OG3-FR frames, split modules for the OG-X-FR frame features two card connectors and can have a combination of BNC, WECO™, fiber optic, serial, and ethernet connectors. Each card connector is routed to a column of five BNCs. A split rear module occupies two slots in the OG-X-FR frame but provides connectors for two openGear cards, allowing you to install up to 20 cards in the frame.

### Blank Rear Modules

---

Blank Rear Modules (R2-BLANK) are used when the slot does not have an openGear card installed. This helps to ensure proper frame cooling and ventilation.

# Chapter 4 – Physical Installation

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If you have questions pertaining to the installation of OG-X-FR, please contact us at the numbers listed in the section ["Contacting AJA Technical Support or Sales" on page 2](#). Our technical staff is always available for consultation, training, or service.

**For More Information on...**

- the technical specifications for the OG-X-FR, refer to ["Specifications" on page 42](#).
- installing an openGear card and its rear module in the OG-X-FR frame, refer to the user guide for your openGear card.

## Before You Begin

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The OG-X-FR mounts in the rack frame by means of four rack screws fastened through the front mounting ears. This should normally be sufficient to carry the load, including the weight of accompanying cables. However, in certain applications such as mobile truck installations, it may be desirable to also support the rear of the frame. The optional Rear Support Bars and Brackets are specifically engineered to compensate for extra load stress.

**For More Information on...**

- installing the brackets, refer to the section ["Installing the Rear Support Bars and Brackets" on page 14](#).
- the frame dimensions, refer to ["Specifications" on page 42](#).

## Static Discharge

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Throughout this chapter, please heed the following cautionary note:



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

## Ventilation and Cooling

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Your OG-X-FR frame was specially engineered to minimize internal heat buildup and thus improve card reliability.

**For More Information on...**

- the power dissipation of individual openGear cards, refer to the user guide for your card.
- replacing the cooling fan module, refer to the section ["Fan Filter Maintenance" on page 38](#).

## Ventilation

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For applications using less than 40W in a non-ventilated OG-X-FR, but where the individual card power consumption is greater than 8W, the cards should be evenly distributed in the frame. This will prevent the creation of concentrated heat, or unbalanced heat-rise areas, in the frame.

*IMPORTANT: For reliable performance, it is recommended that the OG-X-FR frame door not be opened for longer than 5 minutes on frames loaded with more than 40W. For some extra high power cards, the door should not be open for more than 1 minute.*

## Cooling Fan Module

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The OG-X-FR frames come standard with a Cooling Fan Module installed in the frame door. The frame and PS-OGX can supply up to a maximum of 500W of card power, with 15W per card. Under these ventilated conditions, there is no requirement for extra vertical spacing between the frames. The OG-X-FR frames can be stacked one on top of the other, a feature that is highly desirable in densely crowded rack frame environments.



**Caution!** The two sides of the OG-X-FR frame have perforations that are needed to ventilate the power supplies and must not be blocked.

## Airflow Requirements

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Under some conditions, the ambient air temperature inside rack-mount cabinets can be greater than the ambient temperature within a room. For safe long term reliability, ensure the ambient air temperatures at the OG-X-FR frame front intake area are within the product's specified operating temperature range. Adequate ventilation within a rack frame must also be maintained. Ensure to adhere to the following clearance recommendations:

- Minimum 2" (5.08cm) clearance both right and left-hand side of the chassis sides with unrestricted vertical airflow.
- Minimum 5" (12.7cm) clearance at the chassis rear with unrestricted vertical airflow.

## Installation Requirements

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Keep the following in mind when installing your OG-X-FR frame:

- Install the frame for maximum stability during operation and in such a way as to allow adequate ventilation.
- The frame cannot be sealed in a closed container and must be installed in free air space where the ambient temperature is monitored and controlled to not exceed 40°C (104°F) at the frame front door airflow intake.
- Ensure that adequate space exists in front and behind the frame and on both sides of the frame for airflow exhaust.
- The location of the frame should be accessible, dry, and dust-free.

## Installing the Rear Support Bars and Brackets

---

Under normal conditions, mounting the OG-X-FR frame to the front of the rack with four rack screws should be sufficient to carry the load, including the weight of accompanying cables.

To help reduce mechanical stress due to cable weight, the FSB-OGX rear support brackets are available for the OG-X-FR frame. The FSB-OGX are specifically engineered to compensate for extra load stress associated with certain applications, such as mobile truck installations, to also support the rear of the OG-X-FR frame.

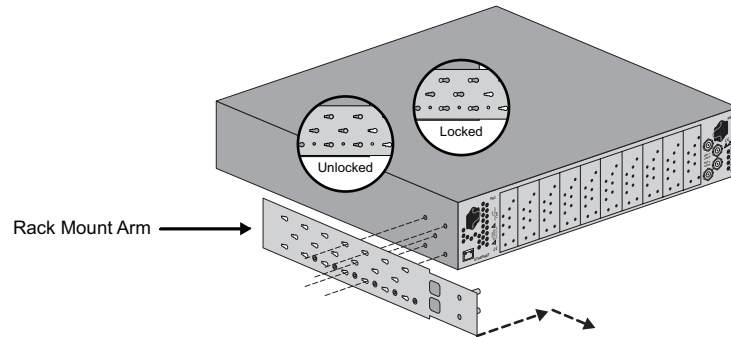
# Installing the FSB-OGX

This section describes how to attach the FSB-OGX rear support bars to a OG-X-FR frame.

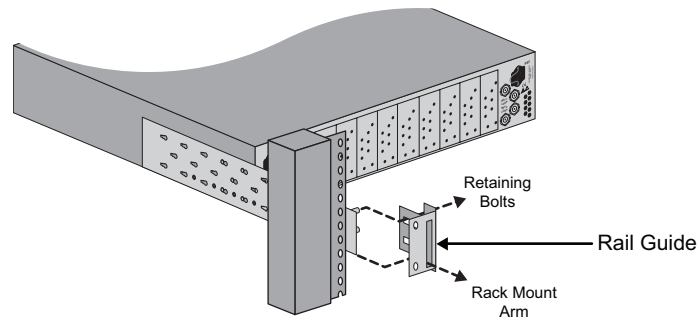
**NOTE:** The FSB-OGX cannot be installed on the DFR-8321 or DFR-8310 frames.

To install the FSB-OGX

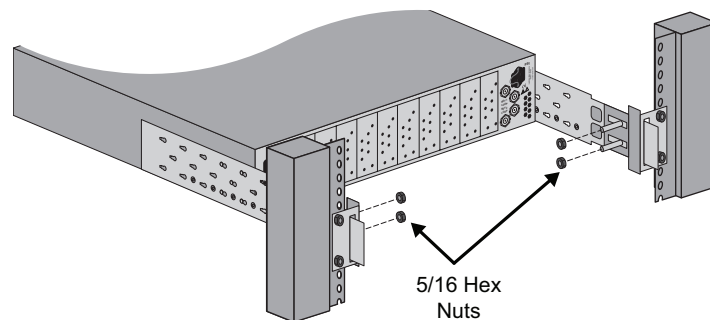
1. Attach the Rack Mount Arms of the FSB-OGX to the OG-X-FR frame.



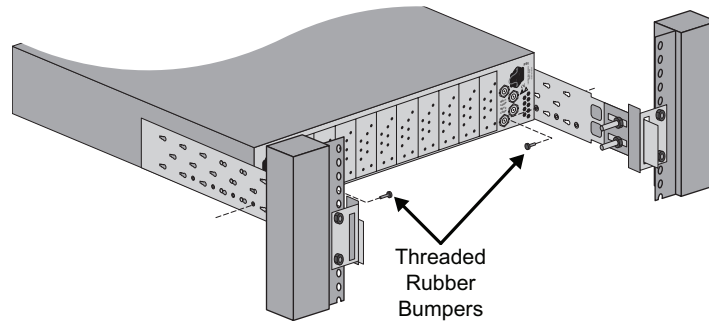
2. Install the Rail Guides for each Rack Mount Arm.



3. Secure the Rail Guides and Rack Mount Arms to the rack.



4. Use the provided Threaded Rubber Bumpers to lock the Rack Mount Arms in place.



## Connecting to a Power Supply

The OG-X-FR comes standard with one power supply, with a second optional power supply (OG-X-PS) available for redundancy. For redundancy, and in applications where the equipment is used in a critical signal path, we recommend that two power supplies be used in the OG-X-FR. One A/C power cable has been provided with each power supply ordered.

For further redundancy, each power cord should be connected to a separate power source for protection against failure of the A/C power circuit. In the event of one power supply failure, the frame load is seamlessly transferred to the other redundant power supply. Although the power supply is "hot-swappable" turning the power supply off before inserting or removing it from the frame will increase the life span of the connectors.

## Power Supply Connectors (PSU1, PSU2)

There are two power supply connectors located on the back of the OG-X-FR:

- **PSU1** — This connector is designated as the AC Connector for the first power supply.
- **PSU2** — This connector is designated as the AC Connector for the second power supply.

Where the connectors are located is dependent on the frame you are using.

### For More Information on...

- power supply locations in your OG-X-FR, refer to the section ["Rear Panel Overview" on page 10](#).
- installing the PS-OGX, refer to the section ["Installing a Frame Power Supply" on page 38](#).

## Power Cable Connection

This section includes information for connecting the power cables for the OG-X-FR frame.



**Warning Hazardous Voltages** — The safe operation of this product requires that a protective earth connection be provided. This protective earth is provided by the grounding conductor in the equipment's supply cord. To reduce the risk of electrical shock to operator and service personnel, this ground conductor must be connected to an earthed ground.

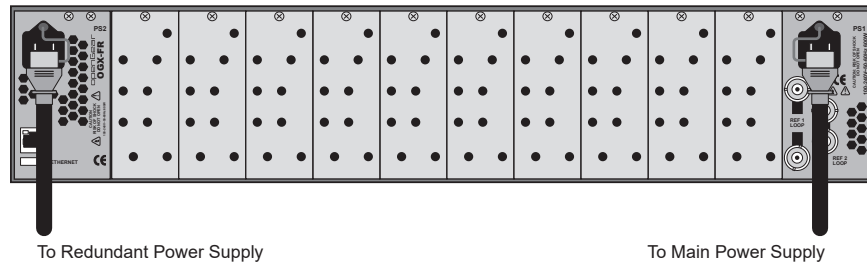


**Warning** — In some countries, it may be necessary to supply the correct mains supply cord. Use only an approved IEC 320 C-13 type A/C line cord rated for a minimum 10A at 250V and certified for the country of use.



To connect the power cables for an OG-X-FR

1. Connect the cable's female IEC connector to the frame socket marked **PS 1**.
2. If the Redundant Power Supply option is installed, plug the second IEC connector into **PS 2**.



**NOTE:** Each AC connector includes a PowerLock, which is designed to retain the power cable connector.

3. Clip the PowerLock over the shoulder of the inserted AC cable end.
4. Connect the supplied power cable's three-prong male connector to an AC outlet.

# Chapter 5 – Ethernet Cabling

The exact steps for connecting to your facility via an ethernet network depends on the network requirements of your facility. Contact your IT Department before connecting to your facility network to ensure that there are no conflicts.

*NOTE: DashBoard uses the open SLP protocol to locate openGear frames on the network.*

## For More Information on...

- configuring the Network Controller card, refer to its user guide.
- installing and using DashBoard, refer to the DashBoard User Manual.
- the specifications for the OG-X-FR, refer to ["Specifications" on page 42](#).

## Cabling the Ethernet Port on the OG-X-FR Frame

The Ethernet port is a standard 10/100/1000 RJ45 Ethernet connector and is used to exchange information with an external monitoring, or control, system over an ethernet network. You must have the MFC-OGX-N installed in the OG-X-FR to take advantage of the GigE connectivity available for cards in the OG-X-FR frame.

### Required Pinouts

The Ethernet port has its RJ45 connector wired as a Network Interface Card (NIC). Table 5.1 provides the wiring information based on the type of Network Controller card installed in the OG-X-FR frame.

*Table 1. Ethernet Port Pinouts*

| Pin Number | MFC-8322-S<br>(10/100 Signal) | MFC-OGX-N<br>(10/100/1000 Signal) |
|------------|-------------------------------|-----------------------------------|
| 1          | Tx+                           | TD1+                              |
| 2          | Tx-                           | TD1-                              |
| 3          | Rx+                           | TD2+                              |
| 4          | *                             | TD3+                              |
| 5          | *                             | TD3-                              |
| 6          | Rx-                           | TD2-                              |
| 7          | *                             | TD4+                              |
| 8          | *                             | TD4-                              |

\* Shorted, 75ohm to Ground

### Connecting to a Network

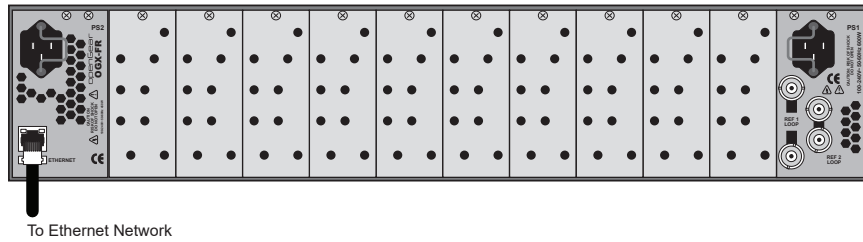
Use up to 328ft (100m) of CAT6 cable or better for GigE network or use up to 328ft (100m) of CAT5 cable or better for 10/100Mbit Ethernet networks.

To connect the Ethernet port to a network

**NOTE:** Connect the **ETHERNET** (RJ-45) port to the same network as your DashBoard client computer or to a network that has a route to the network your DashBoard client computer is on.

1. Connect one free end of a straight through CAT5/5e/6 cable to a free port of the network hub.
2. Connect the other end of the same cable to the Ethernet port on the OG-X-FR rear panel.

*Figure 5. OG-X-FR Frame — Ethernet Cabling*



# Chapter 6 – Reference Cabling

The OG-X-FR frame includes two independent looping reference BNCs (**REF 1**, **REF 2**) with connection to each card slot. Each REF BNC accepts a single composite or tri-level sync signal to feed timing information to the openGear cards installed in the frame.

## GFC-8322 Overview

The GFC-8322 receives the analog reference signals driven to the **REF 1** and **REF 2** BNCs located on the rear panel of OG-X-FR frame. The GFC-8322 then distributes both reference signals to each of the 20 slots in the frame.

Frame settings such as the frame IP address, frame name, and the frame serial number are stored on the GFC-8322 via its Serial EEPROM.

## Connecting a Video Reference Source

This feature distributes one or two reference signals to all cards in the OG-X-FR frame. Cards which need an external reference use this master reference signal in place of taking the signal from one of the card BNCs. This provides for ease of installation and reduction in reference cabling requirements.

### Connecting to a Reference Source

If only one reference type is required for the OG-X-FR frame, connect it to the **REF 1** BNC. Two reference types enables you to use reference sources with a different signal formats, each via a separate REF BNC.

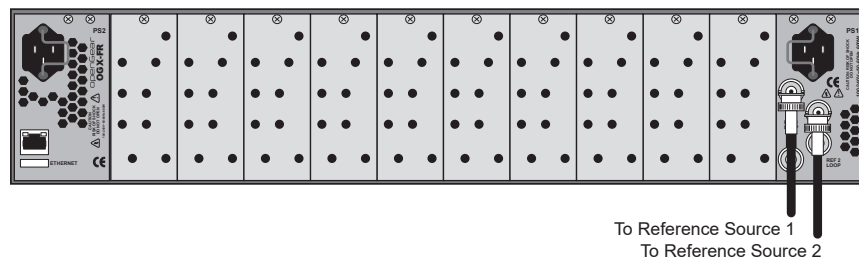
#### For More Information on...

- on specifying the analog reference source for your openGear card, refer to its user guide.

To connect a reference source to the OG-X-FR

1. Connect one end of a Belden cable to the **REF 1** BNC on the OG-X-FR rear panel.
2. Connect the other end of the same Belden cable to the applicable output port on the external reference source device.

*Figure 6. OG-X-FR — Reference Input Cabling*



3. If the reference is not being looped to another device, ensure that the **REF 1 LOOP** BNC is terminated with a 75ohm terminator.
4. Repeat steps 1-3 for **REF 2** if a second reference source is required.

# Looping the Reference Signals

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Use this procedure if you have multiple frames that will switch simultaneously.

To loop a reference signal

---

1. Connect the **REF 1** LOOP BNC on the rear panel of the first frame to the **REF 1** IN BNC on the rear panel of the next frame using a 75ohm coaxial cable.
2. Continue looping the REF connectors across the frames that you want reference to this signal.
3. Ensure that the last frame in the video referencing loop has a 75ohm termination connected to its REF 2 IN BNC.

## Troubleshooting

---

During normal operation, the GFC-8322 must never be removed from the OG-X-FR frame. To ensure this, the metal retaining latch located on the front of the GFC-8322 must be engaged (pushed down) to prevent accidental removal of the GFC-8322 from its slot.

Verify that the GFC-8322 is properly seated in its slot and the retaining latch is engaged when troubleshooting any of the following conditions:

- reference signals are unavailable to the cards installed in the OG-X-FR frame
- loss of network connection or the network settings for the OG-X-FR frame were reset to the default values

# Chapter 7 – MFC-8322-S Network Card

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## Overview

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AJA's OG-X-FR openGear frame ships with the MFC-8322-S network card pre-installed.

### MFC-8322-S Network Card Features

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- Compatible with the OG-X-FR series frames
- Monitors frame power usage, the inlet ambient temperature, the airflow requirements of high-powered cards, and sets the fan speed accordingly

*NOTE: Higher power consumption requires higher fan speed for adequate cooling. The fans always run at maximum speed for five seconds after the fan door is closed, then adjusts to the appropriate level based on power consumption and the inlet ambient temperature.*

- Monitors the frame door and each frame power supply
- Monitors the fan door and notifies the user if the door is left open too long
- Monitors the status of other cards in the frame via the internal bus
- Generates alarms if any of the monitored functions develop errors
- Network settings storage location on the GFC-8322 Reference card that saves items configured on the Network tab plus the Frame Name
- Provides external 10/100Mbps Ethernet connectivity to communicate with DashBoard

### User Interfaces

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Your Network Controller Card may include the following user interfaces:

#### DashBoard Control System

---

The DashBoard Control System enables you to monitor and control openGear frames and cards from a computer. DashBoard communicates with other cards in the openGear frames through the Network Controller Cards. The DashBoard software and user manual are available for download from the Ross website.

#### Card-edge Controls

---

The front-edge of the Network Controller Card feature LED indicators for the power, Ethernet connection, and general communication activity. The Network Controller Card also include DIP switches for specifying the IP address of the frame.

# Installation

## Before You Begin

### Static Discharge

Throughout this chapter, please heed the following cautionary note:



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

### Unpacking

Unpack each Network Controller Card you received from the shipping container. If any items are missing or damaged, contact your sales representative.

**NOTE:** Consult your IT Department before configuring any network settings.

## Installing a Network Controller Card

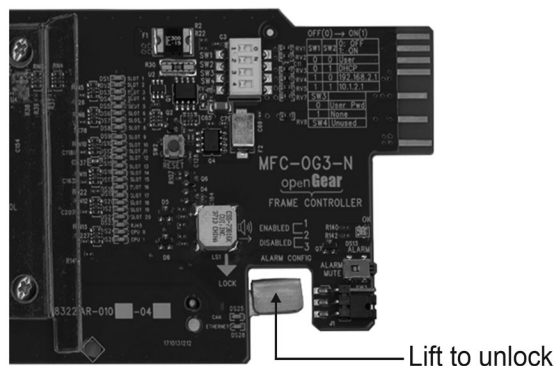
This section outlines how to install a Network Controller Card in an openGear frame. The same procedure applies regardless of the frame or card type. The Network Controller Card installs in the last slot on the right side of the openGear frame (when facing the frame).

**CAUTION:** You must install the MFC-8322-S into an OG-X-FR frame. Attempting to install this card in another frame type can damage your card.

### To install a Network Controller Card

1. Power off the openGear frame.
2. Open the frame door.
3. If necessary, remove any cards from the frame that would interfere with easy access and lines of sight.
4. Lift the lock before inserting the card into its slot. (Figure 2.1)

*Figure 7. Controller Card Lock*



5. Insert the Network Controller Card, with the component side out into the card guides between the dividing wall and the last slot, ensuring the card does not touch the Card Retaining Screw.

6. Slide the card in the slot until firmly seated.
7. Ensure the lock on the front edge of the card is engaged in the down position.
8. Power up the frame.
9. Close the frame door.
10. Check the operation of the fans. If the fans do not operate, verify that:
  - Network Controller Card is seated properly in the frame backplane.
  - Network Controller Card is aligned to the Fan PCB when the door is closed.

## Network Configuration

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The Network Controller Card features an Ethernet interface which allows cards in the openGear frame to be monitored and controlled using the DashBoard Control System. Communication is possible only when the Network Controller Card is suitably configured to match the network to which it is connected.

*NOTE: Consult your IT Department before configuring any network settings.*

This section explains the necessary parameters and lists several possible methods for managing these parameters.

- Automatic configuration using DHCP — When shipped from the factory, the Network Controller card is configured to automatically obtain network settings from a Dynamic Host Configuration Protocol (DHCP) server. Since most networks have a DHCP server available, this method is applicable to most users and is the recommended method.
- Preset configuration using DIP switch(es) — The Network Controller card can be forced to use specific pre-defined network settings by means of DIP switches located on the card surface. This can be used to establish initial communications when no DHCP server is available, or to override a custom user configuration.
- Custom user configuration via DashBoard — Using the network setting options available in the DashBoard Control System, you may configure the Network Controller card to use a static address or enable DHCP for automatic configuration. This can only be done once communication has been established.

*IMPORTANT: Before proceeding, ensure that the DashBoard Control System software is installed on your computer.*

### Automatic Configuration using DHCP

---

This method assumes that the Network Controller Card is using the factory default values for the network settings.

*NOTE: The Network Controller Card boots much faster than a typical DHCP server. In the case of a facility-wide power failure, the Network Controller card may not appear on the network if communications with the DHCP server cannot be established. Once the DHCP server becomes operational, re-boot the Network Controller Card to re-establish communications. To avoid this, you may use a static configuration as described in ["Custom User Configuration via DashBoard" on page 26](#).*

### To establish communications

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1. Ensure that openGear frame is connected to the same network as your DashBoard computer.
2. Launch the DashBoard application on your computer.



3. Power on the openGear frame that the Network Controller card is installed in.
4. Wait approximately 30 seconds while the frame establishes network communications.
5. Verify that the Network Controller Card displays in the Tree View of DashBoard.
6. Should the card fail to display after two minutes:
  - Verify the Ethernet cables are properly connected.
  - Check the link/activity LEDs found on the Ethernet RJ-45 connectors.
  - Ensure the network settings for the Network Controller card are set to the factory default values.
  - If all cables are connected and the LEDs do not indicate an error, then automatic configuration is not possible. Proceed to the section ["Preset Configuration using DIP Switches" on page 25](#).

## Preset Configuration using DIP Switches

This method is used to establish initial communications when no DHCP server is available, or to override a custom user configuration and is intended to be used temporarily in order to establish communication. Once initial communications are established, the Network Controller card should be configured for either DHCP or Static operation.

*NOTE: Use of this method for normal operation is not recommended, as there is a high chance of IP Address conflicts.*

To use a preset network configuration using the DIP Switch(es)

1. Power down the openGear frame that houses the Network Controller card.
2. Quit DashBoard on your computer.
3. Set the DIP Switch to specify the preset IP Address as outlined in the applicable Setup chapter of this manual for your Network Controller card model.
4. Ensure the network settings of your computer are compatible with those chosen for the Network Controller card.

*NOTE: The IP Addresses of the Network Controller Card and your computer must be similar, but not identical, and the Subnet Mask must match exactly the same. For example, if the Network Controller card has an IP Address of 192.168.2.1, then your computer should be configured for an IP Address with 192.168.2.X where X is a number other than 1.*

5. Before you begin, and to prevent IP Address conflicts, isolate the Network Controller Card and your DashBoard computer from the rest of your network.
  - If you are using a hub or switch, unplug all devices except the Network Controller Card and your DashBoard computer; or
  - Connect the openGear frame directly to the DashBoard computer.

*NOTE: The MFC-8322-S supports Auto-MDIX, enabling you to use any Ethernet cable when connecting the frame to the DashBoard computer.*

6. Launch DashBoard on your computer.
7. Power up the openGear frame.
8. Wait approximately 30 seconds while the frame establishes network communications.
9. Verify that the Network Controller Card displays in the Tree View of DashBoard.

10. Should the card fail to display after a minute or two:
  - Verify the Ethernet cables are properly connected.
  - Check the link/activity LEDs found on the Ethernet RJ-45 connectors.
  - Verify that you have properly performed each step of this procedure.

## Custom User Configuration via DashBoard

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Once communication has been established with the Network Controller Card, the network settings may be further adjusted using the following procedure. Note that the steps are optional, you may perform as many, or as few, as needed.

*NOTE: Some settings may require that you configure a DIP Switch before proceeding.*

To configure the network settings via DashBoard

1. In DashBoard, display the Device tab of the Network Controller Card by double-clicking its status indicator in the Basic Tree View.
2. From the Device tab, select the Network tab.
3. To change the display name of the frame, enter a new name in the Frame Name field.
4. To change the Network Time Server address, enter the new IP Address in the NTP Server field.
5. To change between Static and DHCP addressing, select an option in the Addressing Mode area.
6. Configure the network settings as required:
  - IP Address — This is the IP Address of the Network Controller Card.
  - Subnet Mask — This is the Subnet Mask address for your LAN.
  - Default Gateway — This is the IP Address for connection outside the subnet.
7. To save the new settings, click Apply in the Network tab. The settings are saved immediately and take effect except when overridden by DIP Switch settings. Clicking Cancel reverts to the previous settings.

## User Rights Management

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If your facility has installed and configured the DashBoard Server and URM feature, you may need to enter a URM user name and password to access the frame and any of the devices installed in the frame. For details on configuring and using the DashBoard Server and URM feature, refer to the DashBoard Server and URM User Manual.

## Using a Master Password

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Right-clicking an openGear frame node in the tree view of DashBoard provides the option to Lock/Unlock Access which requires the user to enter a Master Password before gaining access to the frame and the cards installed in it. This Master Password can be the same for all frames listed in the DashBoard client, or unique to each frame, or a mix.

When using the DashBoard Server and URM, openGear frame nodes in the Tree View display a lock icon to inform the user that restrictions are in place. This lock icon indicates that the node is locked and requires a Master Password, or that the user must log into the DashBoard client with a valid user account, to gain access to the node.

For More Information on the lock icon, refer to the DashBoard Server and URM User Manual.

## Before You Begin

Verify that you are running the required DashBoard and card software versions. At time of writing, the current version of DashBoard is 9.8.

| Card Model | DashBoard Version | Card Software Version |
|------------|-------------------|-----------------------|
| MFC-8322-S | 4.0.0 or higher   | 2.00 or higher        |

## Configuring the Master Password

Configuring the Master Password for your frame requires configuring the password feature in DashBoard:

### Setting the DIP Switch

Your Network Controller Card includes SW3 (a DIP Switch) that enables you to override the Master Password.

Use this DIP switch when the Master Password needs to be reset (e.g. when you have forgotten the password text). If you change the configuration of the DIP Switch, you must reboot the card before the changes take effect.

Override the Master Password using the DIP Switch as follows:

- OFF — This is the recommended position. A user-specified Master Password is used. The default password is password. It can be changed using DashBoard.
- ON — This position is used to recover a lost Master Password. The user-specified password is temporarily ignored, and the default value of password is used.

### To configure the Master Password in DashBoard

1. Navigate to the frame in the Tree View of the DashBoard client.
2. Right-click the frame node and select Lock/Unlock Access to display the Change Master Password dialog. By default, the current Master Password for the frame is automatically entered into the Old Password field.
3. Select the Change master password check box.
4. Type the new Master Password for the frame in the New Password field.
5. Re-type the new Master Password for the frame in the Confirm field.
6. Select the Prevent unauthorized access to this frame check box to enforce access controls for this frame.
  - Users with older version of DashBoard will be unable to connect to the frame.
  - DashBoard clients version 4.0.0 or higher will use DashBoard URM to determine user access rights.
7. From the dialog window located under the Confirm field, select the frame(s) you wish to apply the new Master Password to. Or you can use the provided menu to quickly select all frames, clear the selections, select only presently locked frames, or select only currently unlocked frames.
8. Click OK.

## Accessing a Network Controller Card

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You can access a Network Controller Card using your user account, assuming you have permissions to do so. If DashBoard URM is implemented in your facility and your DashBoard client is version 4.0.0 or higher, you log in as outlined in the procedure "To use a valid user account". If DashBoard URM is unavailable, or when using the DashBoard Lite applet, you log in as outlined in the procedure "To use the Master Password".

### To use a valid user account

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1. Launch the DashBoard client on your computer.
2. Log into the DashBoard client with your user account and password.
3. Navigate to the frame in the Tree View of the DashBoard client.

### To use the Master Password

---

1. Launch the DashBoard client on your computer.
2. Navigate to a locked frame displayed in the Tree View of the DashBoard client.
3. Double-click the frame node to display the Password Required dialog. You can also double-click the frame name and select Open.
4. Enter the Master Password for the frame in the provided field.
5. Select one of the following methods:
  - Click Try Password to connect to the selected frame; or
  - Click Try for All to connect to all locked frames displayed in the Tree View. Only when you attempt to connect to additional locked frames and the login fails, are you prompted for the password.
6. If the password was incorrect, an error message displays to prompt you for another log in attempt.

## Software Upgrades

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Your Network Controller Card can be upgraded in the field from DashBoard (via TCP/IP) or using the DashBoard Lite applet.

### To upgrade the software on a Network Controller Card

---

1. Download the latest software version file.
2. In DashBoard, display the Device tab of the Network Controller Card by double-clicking its status indicator in the Basic Tree View.
3. From the Device tab, click Upload to display the Select file for upload dialog.
4. Navigate to the \*.bin upload file you want to upload to the Network Controller Card.
5. Click Open to display a confirmation dialog.
6. If you are upgrading a single card, click Finish to display the Uploading to Selected Devices dialog. Proceed to Step 8.
7. If you are upgrading multiple cards:
  - Click Next > to display the Select Destination menu. This menu provides a list of the compatible cards based on the card selected in Step 2.

- Specify the card(s) to upload the file to by selecting the check box(es) for the cards you wish to upload the file to.
- Verify that the card(s) you wish to upload the file to. The Error/Warning fields indicate any errors, such as incompatible software or card type mismatch.
- Click Finish to display the Uploading to Selected Devices dialog.

8. Monitor the upgrade.

- The Uploading to Selected Devices dialog enables you to monitor the upgrade process.
- Notice that each card is listed in the dialog with a button. This button is replaced with a Reboot button once the software file is loaded to that card.

*IMPORTANT: Avoid clicking the individual Reboot buttons until all cards have successfully completed the file upload process and the OK button, located in the bottom right corner of the dialog, is enabled.*

- Click OK to reboot all the cards listed in the Uploading to Selected Devices dialog.
- The Reboot Confirm dialog displays, indicating the number of cards that will reboot. Click Yes to continue the upgrade process. Note that clicking Cancel or No returns you to the Uploading to Selected Devices dialog without rebooting the card(s).

*NOTE: The communications processor of the Network Controller Card requires approximately 30 seconds to re-start and re-establish network communications.*

- The card(s) are temporarily taken offline during the reboot process. The process is complete once the status indicators for the Card State and Connection return to their previous status.

## Troubleshooting

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If you encounter problems when upgrading your card software, verify the following:

- Your network settings on the card are valid.
- The Ethernet cable is properly connected if you are uploading the file via a network connection.
- The file you are attempting to load is a \*.bin file that is for the card you are upgrading.

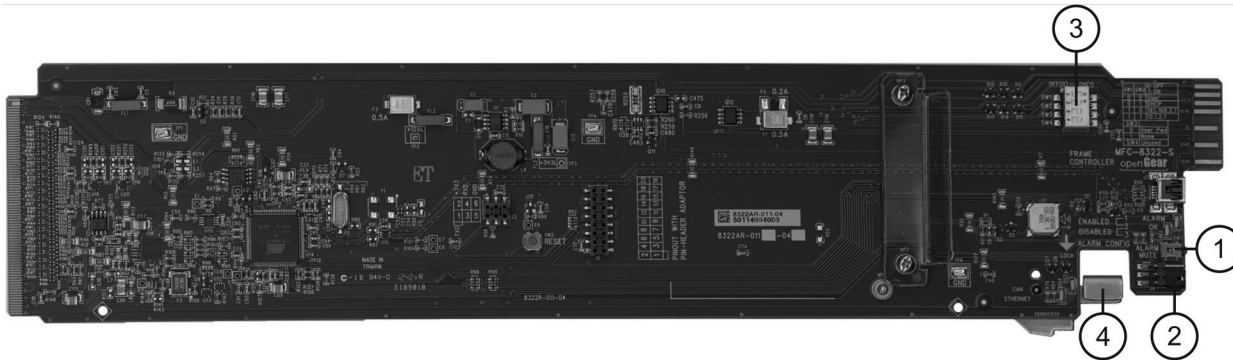
## Card-edge Controls for the MFC-8322-S

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Refer to "[MFC-8322-S Card Controls](#)" on page 30 for the location of card control features such as the Alarm Mute button, and the Alarm Config jumpers.

*NOTE: The MFC-8322-S provides a single DashBoard connection.*

Figure 8. MFC-8322-S Card Controls



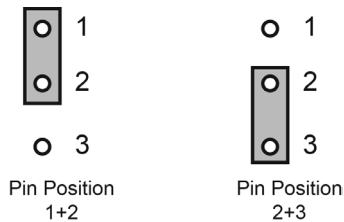
#### 1. Alarm Mute Button

The Alarm Mute button on the card-edge of the MFC-8322-S mutes the audio alarm for two minutes. If a fault condition is still present when the mute time-out ends, the card re-activates the audio alarm.

#### 2. Alarm Config Jumper

The Alarm Config jumper enables or disables the audio alarm signal. The ALARM LED is still lit if alarm conditions are occurring, but the audio will be off. Refer to [Figure 9](#) and the card labeling for jumper positions.

Figure 9. Alarm Config Jumper — Pin Positions



- Enabled — To enable the alarm feature, set the jumper into Position 1+2.
- Disabled — To disable the alarm feature, set the jumper into Position 2+3.

#### 3. DIP Switches

SW1 and SW2 are used in conjunction with the DashBoard menus to set the IP Address of the MFC-8322-S.

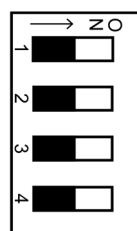
SW3 is used to override the Master Password for the MFC-8322-S. This password limits access to the card, and the cards installed in the frame.

#### 4. Card Lock

This lock located near the front edge of the card is used to secure the card in its frame slot.

## Configuring the DIP Switches

Figure 10. DIP Switches — Set to the ON Positions



## SW1, SW2 — IP Address Setup

SW1 and SW2 are used in conjunction with the DashBoard menus to set the IP Address of the MFC-8322-S (see [Table 2](#)).

Table 2. SW1 and SW2 Positions

| SW1 Position | SW2 Position | Controlled via DashBoard | Descriptions                                                                                                                                                       |
|--------------|--------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OFF          | OFF          | YES                      | The card network settings can be set by the user from the DashBoard Network tab. (default). DHCP Mode is assumed until the user changes the settings in DashBoard. |
| OFF          | ON           |                          | The card network settings are automatically assigned (DHCP Mode).                                                                                                  |
| ON           | OFF          |                          | The card IP Address is set to 192.168.2.1 The card Subnet Mask is set to 255.255.255.0.                                                                            |
| ON           | ON           |                          | The card IP Address is set to 10.1.2.1. The card Subnet Mask is set to 255.255.255.0.                                                                              |

## SW3 — Master Password Override

SW3 is used to override the Master Password. This feature forces a reset of the Master Password. See ["Using a Master Password" on page 26](#) for details.

- OFF — This is the recommended position. A user-specified Master Password is used. The default password is password. It can be changed using DashBoard as outlined in the section "Using a Master Password" on page 2-7.
- ON — This position is used to recover a lost Master Password. The user-specified password is temporarily ignored, and the default value of password is used.

## SW4

SW4 is not implemented at this time and should be left in the OFF position.

# Monitoring the MFC-8322-S

The front card-edge of the MFC-8322-S has LED indicators for the cooling module fan, alarm, and communication activity.

Figure 11. MFC-8322-S Card-edge Controls

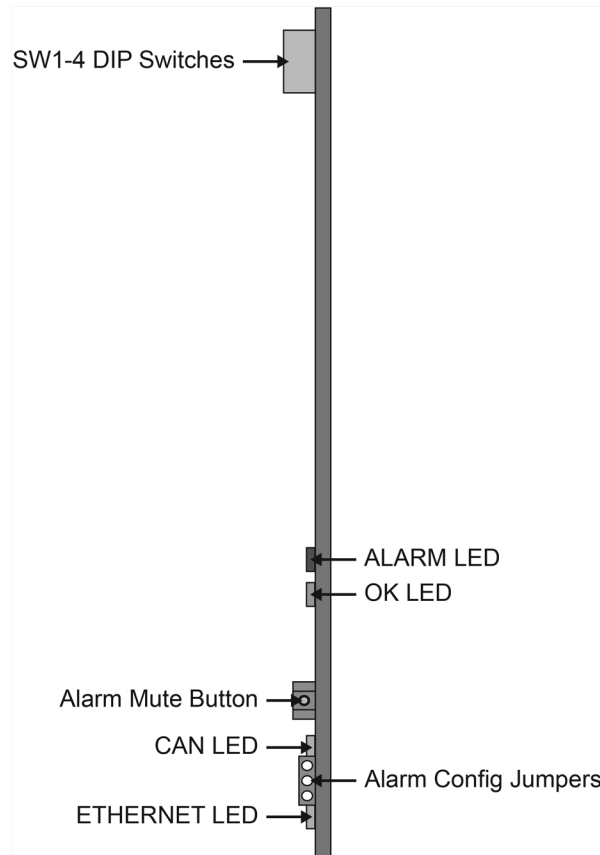


Table 3. MFC-8322-S LED Descriptions

| LED      | Color           | Description                                                                                                                                                                                                                                                                                         |
|----------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OK       | Red             | When lit, this LED indicates a major alarm condition is occurring in the frame.                                                                                                                                                                                                                     |
| ALARM    | Green           | When lit, this LED indicates the MFC-8322-S is operating correctly.                                                                                                                                                                                                                                 |
| CAN      | Flashing Yellow | When flashing, this LED indicates the MFC-8322-S is communicating with the other cards within the frame.                                                                                                                                                                                            |
|          | Off             | When off, this LED indicates an absence of incoming messages.                                                                                                                                                                                                                                       |
| Ethernet | Yellow          | When lit, this LED indicates a valid Ethernet link has been established. No data transfer is currently taking place. NOTE: If this LED remains lit for an extended period of time (e.g. minutes or more), ensure that the Ethernet port on the frame is connected to a functioning Ethernet switch. |
|          | Flashing Yellow | When flashing, this LED indicates that a valid link has been established, and data is currently being exchanged.                                                                                                                                                                                    |
|          | Off             | When off, this LED indicates an absence of Ethernet connection.                                                                                                                                                                                                                                     |



# Troubleshooting Checklist

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

1. Visual Review — Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the card, the frame, and any associated peripheral equipment for signs of trouble.
2. Power Check — Check the power indicator LED on the distribution frame front panel for the presence of power. If the power LED is not illuminated, verify that the power cable is connected to a power source and that power is available at the power main. Confirm that the power supplies are fully seated in their slots. If the power LED is still not illuminated, replace the power supply with one that is verified to work.
3. Input Signal Status — Verify that source equipment is operating correctly and that a valid signal is being supplied.
4. Output Signal Path — Verify that destination equipment is operating correctly and receiving a valid signal.
5. Card Exchange — Exchanging a suspect card with a card that is known to be working correctly is an efficient method for localizing problems to individual cards.

## MFC-8322-S Alarm Mute/Bootload Button

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In the unlikely event of a complete card failure, you may be instructed to perform a complete software reload on the MFC-8322-S. The Alarm Mute/Bootload button enables emergency booting in case of flash corruption or, to recover from a failed software upgrade.

The MFC-8322-S contain a primary software load and two backup loads. When the Alarm Mute/Bootload button is pressed and held during power-up, the card will try the two backups, in turn, instead of the primary load. If a valid backup is found, it is copied into the primary load. If neither backup is valid, then all LEDs are lit to indicate a failure.

When running from a backup copy that differs from the primary load, the Frame Status indicator in the Hardware tab of DashBoard displays “Running a backup code”. If this message displays, we recommend performing a software upgrade to ensure that all copies remain valid.

# Chapter 8 – Using DashBoard

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This chapter provides instructions for launching DashBoard, displaying the OG-X-FR in the Tree View of DashBoard, and accessing the interfaces for the openGear cards installed in your frame.

## Overview

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Each OG-X-FR frame reports the openGear cards installed in its chassis as sub-nodes in DashBoard. Each openGear card can be configured and monitored independently via its options in DashBoard.

Before you can access your openGear cards, you must first ensure the OG-X-FR displays in DashBoard. There are two methods for adding an OG-X-FR frame to the Tree View in DashBoard:

- using the auto-connect feature or
- manually adding a frame by specifying the IP address of the frame. Both methods are described in the following sections.

## Launching DashBoard

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DashBoard connects to the OG-X-FR frame using a TCP/IP LAN connection.

*NOTE: DashBoard must run on a computer that has a physical wired ethernet connection. Wireless connections do not allow device discovery.*

### **For More Information on...**

- downloading and installing the DashBoard client software, refer to the ***DashBoard User Manual***.

To launch DashBoard

1. Ensure that DashBoard is installed on a PC connected to the same network as your OG-X-FR frame.
2. Ensure that you are running the latest DashBoard software.
3. Launch DashBoard by double-clicking its icon on your computer desktop.

## Using the Automatic Detection Feature

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When DashBoard is launched, and the Automatic Discovery feature of DashBoard is enabled, the OG-X-FR frame is automatically discovered and is available in the Tree View.

By default, DashBoard auto-detects any OG-X-FR frame on the same IP subnet. How often DashBoard queries the network for new OG-X-FR frames (the default is every 10 seconds) depends on how the Automatic Detection feature is configured in the Preferences menu of the DashBoard client.

## Manually Adding OG-X-FR Frames to DashBoard

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You must add OG-X-FR frames to the Tree View manually when the frame is on a different subnet from your computer running the DashBoard client.

To manually add an OG-X-FR frame to a DashBoard Tree View

1. Click **+** from the Tree View toolbar. The **Select Equipment or Service Type to Add** dialog opens.
2. Expand the **openGear / DashBoard Connect** node.
3. Select **TCP/IP DashBoard Connect or openGear Device**.
4. Click **Next >**. The **New TCP openGear Frame Connection** dialog opens.

5. In the **IP Address** box, type the IP address of the OG-X-FR frame.

To request that DashBoard detect the frame properties automatically

1. Click **Detect Frame Information**.
2. Verify that DashBoard retrieves the correct port, name, unique identifier, and other connection information from the specified IP address.
3. Verify that the **Automatically Track Updates to Frame Information** box is selected so that any changes are automatically updated in DashBoard.

To specify frame properties manually

1. Type the name of the OG-X-FR frame, as you want it to appear in DashBoard.
2. From the **Protocol** options select **OGP** (openGear Protocol).
3. Use the **Port** field to specify the port used for communication.
4. Select the **Remember connection settings for this frame** box to retain the settings.
5. Click **Finish** to display the OG-X-FR frame in the Tree View.

*NOTE: OG-X-FR frames added to the Tree View are also displayed in the Advanced Tree View.*

6. Repeat the procedure for each OG-X-FR frame that you wish to add to the Tree View.

## Re-naming the OG-X-FR Frame in the Tree View

Once your OG-X-FR frame displays in DashBoard, you may wish to provide a unique display name for the frame for easier identification in the Tree View. There are two methods for re-naming an OG-X-FR frame in DashBoard depending on how you added the frame to the Tree View in DashBoard. The first method is for frames manually added to the Tree View. The second method describes how to re-name an auto-detected frame using the DashBoard menu options available on the Network Controller Card. Both methods are described below.

To re-name a manually added OG-X-FR frame

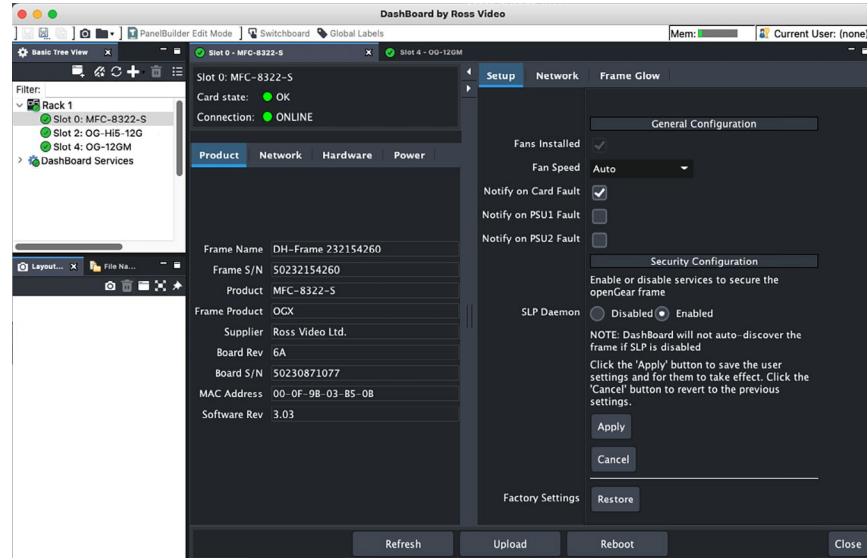
1. Right-click the OG-X-FR frame you wish to rename.
2. Select **Rename Frame**.

3. Enter the new name for the OG-X-FR frame in the text field provided.

To re-name an auto-detected OG-X-FR frame

1. Right-click the OG-X-FR frame you wish to rename.
2. Select **Open**. The interface for the Network Controller Card displays in the DashBoard window.

In the following example, the interface for an MFC-8322-S displays.



3. Select the **Network** tab.
4. Enter a new name for the OG-X-FR frame in the **Frame Name** field.
5. Press **Enter**.
6. Click **Apply**.

## Removing an OG-X-FR Frame from the Tree View in DashBoard

This section outlines how to remove an OG-X-FR frame from a Tree View in DashBoard. Once a frame is removed, DashBoard no longer reports the status in the Tree View and you are no longer able to monitor or control the affected devices. If communication with a frame is disconnected via the Disconnect option, the status indicator is light gray until the frame is re-connected. If the status indicator is dark gray, with the rest of the node displaying as normal, a connection cannot currently be established to the device.

**NOTE:** If the OG-X-FR frame you are removing is in a Custom Folder, you must first delete the frame from the Custom Folder before it can be removed from the Tree View.

To remove an OG-X-FR frame from the Tree View

1. Right-click the OG-X-FR frame you wish to remove.
2. Select  to remove the OG-X-FR frame from the Tree View.

To disconnect an OG-X-FR frame from the Tree View

1. Toggle  to off.

2. Right-click the OG-X-FR frame status indicator.
3. Select  or toggle  to on.

## Auto-Discovery

Selecting  for an auto-detected OG-X-FR frame will temporarily remove the frame but the frame will re-appear in the Tree View again due to the auto-discovery feature of DashBoard. You must first disable the auto-discovery feature before you can remove a frame in this instance. Refer to the **DashBoard User Manual** for details on configuring the auto-discovery feature.

*NOTE: You can still disconnect from an auto-discovered frame by toggling the Automatic Discovery option off.*

## Using DashBoard to Access openGear Cards in the OG-X-FR Frame

The OG-X-FR frame displays in DashBoard as a main node in the Tree View with a series of sub-nodes. Each sub-node represents an openGear card installed in that frame.

### For More Information on...

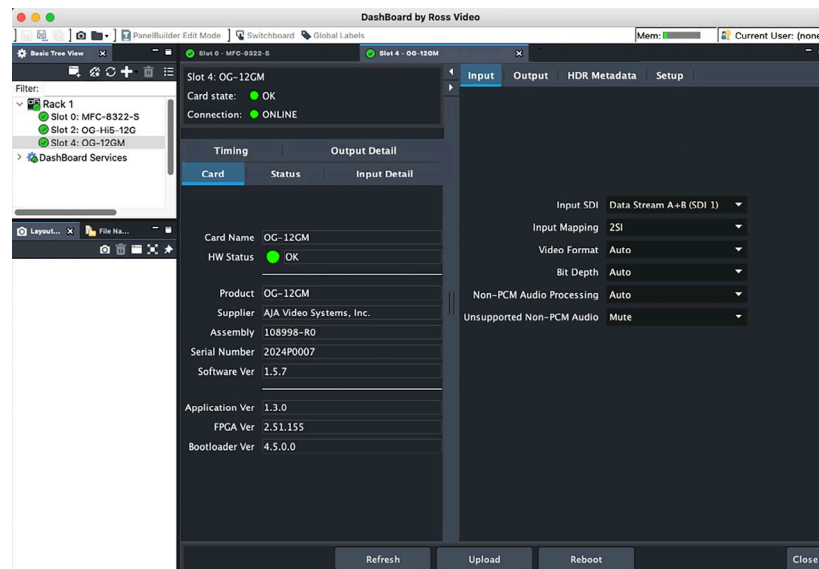
- available menus and parameters for your openGear card, refer to the user guide for your card.

To access an openGear card in DashBoard

1. Locate the OG-X-FR frame in DashBoard.
2. Expand the OG-X-FR frame node. A list of sub-nodes displays in the Tree View.



3. Double-click an openGear card node to displays its interface in DashBoard.
- In the example below, the OG-12GM was selected.



# Chapter 9 – Maintenance

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This chapter summarizes maintenance tasks such as installing a new frame power supply, cleaning the frame air filter, and replacing the Cooling Fan Module.

## Installing a Frame Power Supply

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The PS-OGX is a power factor corrected supply, capable of working with all world AC standards (100-240V). Each supply has an indicator LED on its front panel, and an error detection circuit that monitors the power supply operation.

*NOTE: The OG-X-PS power supply installs on the right or left side of the OG-X-FR chassis.*

To install the power supply

1. Carefully unpack the power supply from its box, and retain all packing material for future use, if required.
2. Align the power supply into an unused power slot on the side of the frame.
3. Push the power supply in firmly to ensure a tight connection at the rear of the frame.

## Fan Filter Maintenance

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Routine maintenance of the fan filter installed in the OG-X-FR is highly recommended to ensure proper airflow through the chassis.

### Cleaning the Frame Air Filter

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The OG-X-FR has a single air filter that is used to prevent dust and airborne particulates from contaminating the frame. This filter should be cleaned at least once a year; but may need to be cleaned more frequently in some environments.

To remove the air filter from the frame door

1. Locate the four 3/16" screws (#850-091R) on the frame door faceplate ([Figure 12](#)).

*Figure 12. OG-X-FR — Screw Locations on Front Panel*



2. Using a Phillips screwdriver, remove the four screws that secure the faceplate. Set the screws aside.
3. Ensure that the side door tabs are disengaged from the door.
4. Remove the faceplate by gently pulling it towards you while avoiding the Diagnostic Panel, the **Toggle** button, and the **STATUS** LED.

5. Gently remove the air filter off the metal protective screen that separates the filter from the fans.

To clean the air filter

1. Brush any loose dust off of the filter.
2. Place the filter under warm running water to remove any remaining dust. On one side of the filter is a foam filter material. When rinsing, water should flow out of this side.
3. Remove the filter from the water and thoroughly pat dry with a towel to remove any moisture.

To replace the clean, dry filter into the frame door

1. Place the clean air filter across the metal protective screen, orienting it in the same position you found it in during step 1 of the procedure **"To remove the air filter from the frame door"**.
2. Install the faceplate by gently fitting it back onto the frame door, ensuring the faceplate does not interfere with the Diagnostic Panel, the **Toggle** button, and the **STATUS** LED.
3. Verify that the side door tabs are seated properly in the cutouts on the frame door bracket.
4. Using a Phillips screwdriver, secure the faceplate using the four screws removed during step 2 of the procedure **"To remove the air filter from the frame door"**.

## Replacing the Frame Air Filter

Order the Air Filter Replacement Kit (AFK-OGX) from your openGear sales representative before replacing the frame air filter in your OG-X-FR frame.

To remove the old air filter from the frame door

1. Using a Phillips screwdriver, remove the four 3/16" screws (#850-091R) screws that secure the faceplate (*Figure 13*). Set the screws aside.

*Figure 13. OG-X-FR — Screw Locations on Front Panel*



2. Ensure that the side door tabs are disengaged from the door.
3. Remove the faceplate by gently pulling it towards you while avoiding the Diagnostic Panel, the **Toggle** button, and the **STATUS** LED.
4. Gently remove the air filter off the metal protective screen that separates the filter from the fans.

To install the new filter into the frame door

1. Place the new air filter across the metal protective screen, orienting it in the same position you found it in during step 1 of the procedure **"To remove the old air filter from the frame door"**.

2. Install the faceplate by gently fitting it back onto the frame door, ensuring the faceplate does not interfere with the Diagnostic Panel, the **Toggle** button, and the **STATUS** LED on the frame door.
3. Verify that the side door tabs are seated properly in the cutouts on the frame door bracket.
4. Using a Phillips screwdriver, secure the faceplate using the four screws removed during step 1 of the procedure **"To remove the old air filter from the frame door"**.

## Replacing the Cooling Fan Module

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The Cooling Fan Module is installed in the OG-X-FR door. To replace a failed Cooling Fan Module, you need to replace the entire frame door.

*NOTE: Contact your openGear sales representative to order a Cooling Fan Module Replacement Kit (CFM-OGX).*

## Replacing the OG-X-FR Door

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The CFM-OGX includes the fan board and filter pre-installed in a new OG-X-FR frame door. You will need to remove the old door from your OG-X-FR frame and replace it with the new door.

To remove the old door from the OG-X-FR frame

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1. Gently pull the side door tabs towards the center of the door, releasing the door from the frame.

*NOTE: The door extender arms retain the door to the chassis.*

2. Using both hands, pull the door towards you.
3. Tilt the door upward until the extender arms match the cutout for the retaining bolts.
4. Gently push the door extender arms in and over the retaining bolts and unhook from the frame.
5. Remove the door and place it on a clean, flat, static-free surface.

To install the new door in the frame

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1. Using both hands, with the door tilted up, slide the new door into the frame while pushing the extender arms in and over the retaining bolts.
2. Pull and release the door tabs to ensure the:
  - frame door is securely locked to the OG-X-FR frame, and
  - the tabs latch into the frame.



# Chapter 10 – Service Information

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Routine maintenance to this openGear product is not required. In the event of problems with your card, the following basic troubleshooting checklist may help identify the source of the problem. If the frame still does not appear to be working properly after checking all possible causes, please contact the Technical Support department at the numbers listed under *"Contacting AJA Technical Support or Sales" on page 2.*

1. **Visual Review** — Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the card, the frame, and any associated peripheral equipment for signs of trouble.
2. **Power Check** — Inspect the power indicator LED on the distribution frame front panel for the presence of power. If the power LED is not illuminated, verify that the power cable is connected to a power source and that power is available at the power main. Confirm that the power supplies are fully seated in their slots. If the power LED is still not illuminated, replace the power supply with one that is verified to work.
3. **Input Signal Status** — Verify that source equipment is operating correctly and that a valid signal is being supplied.
4. **Output Signal Path** — Verify that destination equipment is operating correctly and receiving a valid signal.
5. **Unit Exchange** — Exchanging a suspect unit with a unit that is known to be working correctly is an efficient method for localizing problems to individual units.

# Appendix A – Specifications

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## OG-X-FR Series Tech Specs

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### Frame Controller and Fans

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- Total Power: 50W maximum
  - Max. Power: +12V Rail 4A, 48W
  - Max. Power: -7.5V Rail 0.2A (1.5W)

### GFC-8322

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- Total Power: 3.9W maximum
  - Max. Power: +12V Rail 0.2A (2.4W)
  - Max. Power: -7.5V Rail 0.2A (1.5W)

### Reference Inputs

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- Number of Inputs: 2 looping
- Level: 1Vpp nominal
- Signal: Analog video sync (Blackburst or tri-level), or AES/EBU DARS
- Impedance: 75 ohms terminating
- Return Loss: >30 dB to 30 MHz
- Maximum DC on REF Input:  $\pm 1V$

### Card Slots

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- 20 Slots
- Total Power Available: 500W
- Maximum Card Power:
  - High Density (Split) Rear Module: 15W per card, accommodates two openGear cards and requires two slots in the frame chassis
  - Standard Rear Module Accommodates one openGear card and requires two slots in the frame chassis: 30W per card, or 45W if the openGear card has integrated cooling.
  - Double Wide Rear Module: 60W per card, or 75W for a single card with integrated cooling, or 90W for a multi-slot assembly with integrated cooling and receiving power from two or more midplane connectors.

### Size (w x d x h)

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- 2RU 3.5" x 19.0" x 17.7" (88.9 x 482.6 x 449.58 mm)

### Power

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- Total Sum of both outputs not to exceed 500W
  - Input: 6.3A (650W)
  - Output 1: 12V 41.6A, 500W maximum
  - Output 2: -7.5V 5A, 37.5W maximum

### Environment

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- Safe Operating Temperature: 0 to 40 C (32 to 104 F)
- Operating Relative Humidity: <90% noncondensing

# 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, European Free Trade Association (EFTA) and United Kingdom Regulatory Compliance

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

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

## Declaration of Conformity

Marking by these symbols 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 Report/Certificates)

Additional licenses issued for specific countries available on request.

### Emissions

EN 55032: 2015 + A11: 2020, CISPR 32: 2015,  
EN 61000-3-2: 2014, EN 61000-3-3: 2013

### Immunity

EN 55035: 2017 + A11: 2020, 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: 2014,  
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.

### Laser

EN 60825-1: 2014+A11 and EN 60825-2: 2004+A1+A2,  
CDRH Compliant Class 1 (TUV Cert No.'s R50408760 & R-50503028)  
Also Licensed for Standards: FDA 21 CFR 1040.10 and 1040.11



**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

### 사 용 자 안 내 문

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.

## Japan 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.

## Chinese Compliance Statement

This product has been tested to the following Chinese standards:

GB 17625.1-2022, GB 4943.1-2022, GB/T 9254.1-2021

This is to certify that the above mentioned product(s) complies with the requirements of certification rules of CQC12-045800-2022 under certificate number CQC2016010805863394.

## 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 corriente 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 éclairsou 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.



CLASS 1  
LASER  
PRODUCT

**Warning!** Active fiber-optic cables emit radiation invisible to the human eye. Do not look directly at the end of an active fiber-optic cable or the fiber connector on a Class 1 Laser Product.

**Avvertissement!** Les câbles fibre optique émettent des radiations invisibles à l'oeil humain. Ne regardez pas directement l'extrémité d'un câble fibre optique ou d'un connecteur de fibre d'un produits laser de Classe 1.

**Warnung!** Glasfaserkabel emittieren im Betrieb Strahlung, die für das menschliche Auge unsichtbar ist. Nicht direkt in das Ende eines im Betrieb befindlichen Glasfaserkabels bzw. den Glasfaserkabelanschluss Lasergeräte der Klasse 1.

**¡Advertencia!** Los cables de fibra óptica activos emiten radiación invisible al ojo humano. No mire directamente hacia el extremo de un cable de fibra óptica activo o hacia el conector de fibra óptica del Productos Láser Clase 1.

**Avvertência!** Os cabos de fibra óptica emitem radiação invisível para o olho humano. Não olhe diretamente para a extremidade de um cabo de fibra óptica ativo ou para o conector da fibra em um Produtos de Laser Classe 1.

**Avvertenza!** I cavi a fibre ottiche emettono radiazioni invisibili all'occhio umano. Non guardare direttamente l'estremità di un cavo in fibra ottica attivo o il connettore in fibra su prodotti laser di classe 1.



**Warning!** Ensure Mains Power is disconnected before installing the OG-X-FR 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.

**Avvertissement !** Avant d'installer des modules OG-X-FR 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-X-FR 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-X-FR nel frame o di installare e rimuovere componenti opzionali. Se non è presente un interruttore di accensione/spegnimento, 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-X-FR 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-X-FR 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 de l'OG-X-FR est lourde. Enlevez-la avec précaution.

**Vorsicht!** Die vordere Gebläsetür des OG-X-FR ist schwer. Vorsicht beim Entfernen.

**Attenzione.** Il coperchio dell'alloggiamento della ventola anteriore del modulo OG-X-FR è pesante. Rimuoverlo con cautela.

**Cuidado!** A porta da ventoinha dianteira do OG-X-FR é pesada. Retirar com Cuidado.

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



**Warning! Hazardous Voltages!** The safe operation of this product requires that a protective earth connection be provided. This protective earth is provided by the grounding conductor in the equipment's supply cord. To reduce the risk of electrical shock to operator and service personnel, this ground conductor must be connected to an earthed ground.

**Avertissement : tensions dangereuses** — Pour utiliser ce produit en toute sécurité, il faut un raccordement à la terre. Ce raccordement s'effectue par l'intermédiaire du connecteur de terre dans le cordon d'alimentation de l'équipement. Pour réduire le risque d'électrocution de l'opérateur ou du personnel de maintenance, ce cordon avec conducteur de terre doit être branché sur une prise reliée à la terre.

**Achtung! Gefährliche Spannungen** — Sichere Bedienung dieses Geräts erfordert, dass ein Schutzleiteranschluss vorgesehen wird. Dieser Schutzleiteranschluss wird mittels der Erdungsleitung im Netzkabel der Vorrichtung vorgesehen. Um die Gefahr eines Elektroschocks für Bedien- und Wartungspersonal zu verringern, muss diese Erdungsleitung mit einer geerdeten Masse verbunden werden.

**Avvertenza – Alte tensioni** – Il funzionamento in sicurezza di questo prodotto richiede una presa di terra, che viene fornita dal conduttore di messa a terra presente nel cavo di alimentazione dell'apparecchio. Per ridurre il rischio di elettrocuzione per l'operatore e il personale di manutenzione, tale conduttore deve essere collegato a un punto al potenziale di terra.

**Advertencia de voltajes peligrosos** — El funcionamiento seguro de este producto requiere que se proporcione una conexión terrestre protegida. Esta protección terrestre es proporcionada por el conductor de conexión en la tierra del cable de alimentación del equipo. Para reducir el riesgo de descarga eléctrica al operador y el personal de servicio, este conductor de conexión de la tierra debe ser conectado a la misma tierra.



**Warning!** In some countries, it may be necessary to supply the correct mains supply cord. Use only an approved IEC 320 C-13 type A/C line cord rated for a minimum 10A at 250V and certified for the country of use.

**Avertissement** — Dans certains pays, il peut être nécessaire de fournir le cordon électrique adéquat. N'utilisez que des cordons électriques homologués de type CEI 60320 C13 d'au moins 10A en 250V et certifiés pour le pays d'utilisation.

**Achtung** — In einigen Ländern kann es erforderlich sein, das richtige Netzkabel zur Verfügung zu stellen. Nur ein zugelassenes IEC 320 C-13 AC-Netzkabel benutzen, das für mindestens 10A bei 250V bemessen und für das Verwendungsland zertifiziert ist.

**Aviso** — Em alguns países, poderá ser necessário fornecer o cabo de alimentação elétrico correto. Utilize apenas cabo de linha C/A tipo IEC 320 C-13 aprovado para um mínimo de 10A a 250V e certificado para o país de utilização.

**Advertencia** — En algunos países, puede ser necesario suministrar la red de cable de alimentación correcta. Utilice solamente un cable aprobado de línea IEC 320-13 C Tipo A/C nominal para un mínimo de 10A a 250V y certificado para el país de uso.

# 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.