OTF-OGX User Guide

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David Ross
CEO, Ross Video
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OTF-OGX · User Guide

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Patents

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

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

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

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Contents

Introduction

This guide provides installation and operation information for the OTF-OGX openGear Test Fixture. 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 OTF-OGX.
- "**Physical Installation**" provides instructions for the physical installation of the OTF-OGX.
- "**Card Installation**" provides an overview of
- "**Cabling**" provides an overview of the
- "**User Controls**" outlines the
- "**Technical Specifications**" provides the specifications for the OTF-OGX.
- "**Service Information**" provides information on the warranty and repair policy for your OTF-OGX.

Related Publications

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

- ***openGear Hardware Development Guide***
- ***openGear Software Development Guide***

Documentation Conventions

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

Interface Elements

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

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

User Entered Text

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

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

Referenced Guides

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

For more information, refer to the ***openGear Hardware Development Guide***.

Menu Sequences

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

Important Instructions

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

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

Contacting Technical Support

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

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

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

Before You Begin

The openGear OTF-OGX Test Fixture jig is for testing terminal equipment cards with an openGear form factor. When fitted with a Frame Controller card, the OTF-OGX is capable of testing one or more openGear cards for remote control operation and configuration.

The OTF-OGX is designed to accept up to two OGX-FR rear modules and up to four openGear cards. The rear modules designed for the OG3-FR, the DFR-8320, and the DFR-8321 are also supported.

The OTF-OGX also provides connections for Ethernet links from each card slot to the Frame Controller Card, as found in the OGX-FR series frame. Cards designed to take advantage of this can be used in the OTF-OGX and the ethernet links can be tested in the OTF-OGX.

For More Information on...

- the Ethernet connectivity, refer to the ***openGear Hardware Development Guide***.

Features

The OTF-OGX includes the following features:

- Dedicated slot for one Frame Controller Card
- On-board Reference and ID circuitry
- Dedicated slot for optional Reference card (GFC-8322)
- Slots for up to four openGear cards
- Two Slot ID switches
- Power Supply Serial Communication selector switch
- Ethernet connector (RJ45)
- MFC-OG3-N also provides Ethernet connectivity to each card slot
- CAN bus connector (RJ45)
- Two reference BNCs
- Fault, +12V, and -7V LED indicators
- Power supply and AC cable
- Auxiliary +12V power connector
- Can accommodate up to two OGX-FR rear modules

Physical Installation

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

For More Information on...

- the technical specifications for the OTF-OGX, refer to the chapter "**Technical Specifications**" on page 27.
- installing an openGear card and its rear module, refer to the user guide for your openGear card.

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 OTF-OGX you received from the shipping container, and check the contents to ensure that all items are included. If any items are missing or damaged, contact your openGear sales representative or Ross Video directly.

Installation Requirements

The OTF-OGX is designed to be operated on a grounded workbench in an electronics laboratory environment. **Table 3.1** outlines the OTF-OGX physical dimensions.

Table 3.1 Technical Specifications — OTF-OGX Dimensions

Item	Specifications
Height	4.06" (10.3cm)
Width	7.693" (19.5cm)
Depth	14.3" (36.3cm) including one PS-OGX

The OTF-OGX has the following installation requirements:

- Install the OTF-OGX for maximum stability during operation and in such a way as to allow adequate ventilation.
- Ensure that adequate space exists behind the OTF-OGX and on the front of the power supply for airflow exhaust.
- The OTF-OGX location should be accessible, dry, and dust-free.

Power Supply PS-OGX and Power Cable

The OTF-OGX is powered with one PS-OGX power supply. To improve performance and reliability, the PS-OGX has an on-board fan. Turning the power supply off before inserting or removing it from the OTF-OGX will increase the lifespan of connectors.

Installing the Power Supply

The PS-OGX is a power factor corrected supply, capable of working with all world AC standards (100-240V). The power supply plugs into the lower left slot as you look at the OTF-OGX from the front. Refer to **Figure 3.1**.

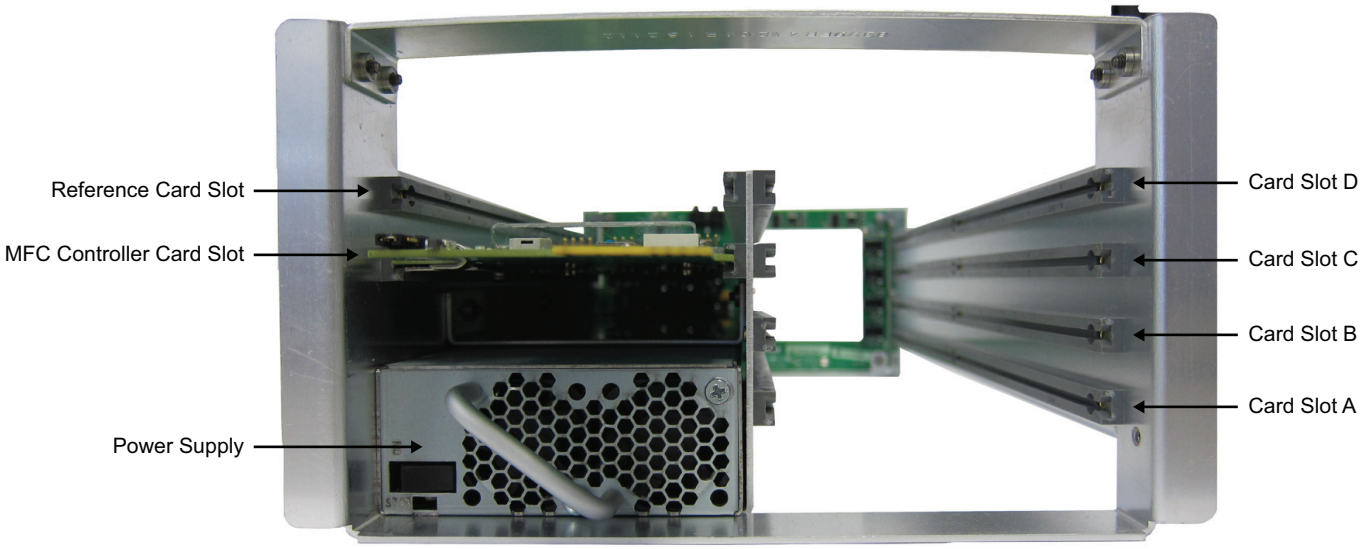

Figure 3.1 Power Supply in the OTF-OGX

Warning Hazardous Voltages

To install the PS-OGX

1. Carefully unpack the power supply from its box, and retain all packing material for future use, if required.
2. Align the power supply with the power slot on the rear lower left side of the OTF-OGX.
3. Push the power supply in firmly to ensure a tight connection with the socket at the end of the slot.

★ In the case of a power supply failure, contact your openGear Sales Representative or Ross Video.

Status LEDs

The power supply has an indicator LED on the front, and an error detection circuit that will indicate the conditions described in **Table 3.2**.

Table 3.2 PS-OGX Status LED Descriptions

LED	Color	Description
STAT	Green	When lit green, this LED indicates that the PS-OGX is operating normally
	Flashing Red	When flashing red, this LED indicates that there is an over or under voltage condition occurring

Power Cable Connection

Warning Hazardous Voltages — *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.*

Further, 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.

To connect the power cable

1. Connect the supplied power cable's three prong male connector to an AC outlet.
2. Connect the cable's female IEC connector to the fixture socket marked **AC1**.

✶ The fan internal to the PS-OGX will run when the AC is connected but the power switch is off.

Card Installation

This chapter briefly summarizes the type of openGear cards that are installed in the OTF-OGX.

Frame Controller Card Slot

The Frame Controller Card slot, located above the power supply, allows the openGear card(s) installed in the OTF-OGX to be monitored and controlled via DashBoard. The following cards can be used in the Frame Controller Card slot:

- MFC-OG3-N
- MFC-8322-S

MFC-OG3-N, MFC-8322-S Functions and Controls

The MFC-OG3-N and MFC-8322-S cards perform the following functions:

- Bridges the external Ethernet network to the local CAN bus for monitoring and control of any openGear card installed in the OTF-OGX.
- Monitors the PS-OGX to ensure that its fan is operating correctly.
- Monitors the status of the openGear card(s) in the OTF-OGX via the CAN bus.
- Generates alarms if any of the monitored functions develop errors.

✶ The MFC-OG3-N also provides Ethernet connectivity from the MFC-OG3-N to each openGear card slot.

For More Information on...

- the Network Controller features, refer to the ***MFC-OG3-N and MFC-8322-S User Guide***.

Reference Card Slot

The slot located above the Frame Controller Card slot is intended for a GFC-8322 reference distribution card. This card was designed specifically for use in the OGX-FR frames and includes the circuitry to buffer the frame reference to each slot.

When using the GFC-8322, be aware that the Frame ID (network settings and the frame name) is automatically determined and stored on the GFC-8322 and not on the OTF-OGX midplane. If you have not installed the GFC-8322, the Frame ID is automatically determined and stored on the OTF-OGX midplane. This is important to keep in mind when installing or removing the GFC-8322 from the OTF-OGX.

For More Information on...

- configuring the GFC-8322 for use in the OTF-OGX, refer to the section "**REF 1, REF 2 BNCs**" on page 20.

openGear Card Slot(s)

The OTF-OGX can support up to four openGear cards and two rear modules. The card slots are to the right of the Frame Controller Card slot, as shown in **Figure 3.1**. The four card slots are labeled, from bottom to top: A, B, C, and D.

- **Slot A** is designed to support one side of a split rear module installed in the lower rear module position
- **Slot B** is designed to support either a full rear module or one side of a split rear module installed in the lower rear module position.
- **Slot C** is designed to support one side of a split rear module installed in the upper rear module position
- **Slot D** is designed to support either a full rear module or one side of a split rear module installed in the upper rear module position.

To install a rear module into the OTF-OGX

1. Determine how many slots your rear module requires.
2. Seat the bottom of the rear module in the seating slot at the base of the fixture's back plane.
3. Align the top screw of the rear module with the screw hole on the top edge of the back plane.
4. Using a Phillips driver and the supplied screw, fasten the rear module panel to the back plane.

✶ Do not over tighten the screw.

To install an openGear card in the OTF-OGX

1. Select the desired installation slot on the OTF-OGX.
2. Hold the openGear card by the edges and carefully align the card edges with the slots in the OTF-OGX.
3. Fully insert the card into the fixture until the rear connection plugs are properly seated on the midplane and rear module.

Cabling

This chapter provides instructions for connecting cables to the BNC connectors on the OTF-OG3 PCB. Input and output connectors for the cards are not provided. Refer to **Figure 5.1** for connector locations.

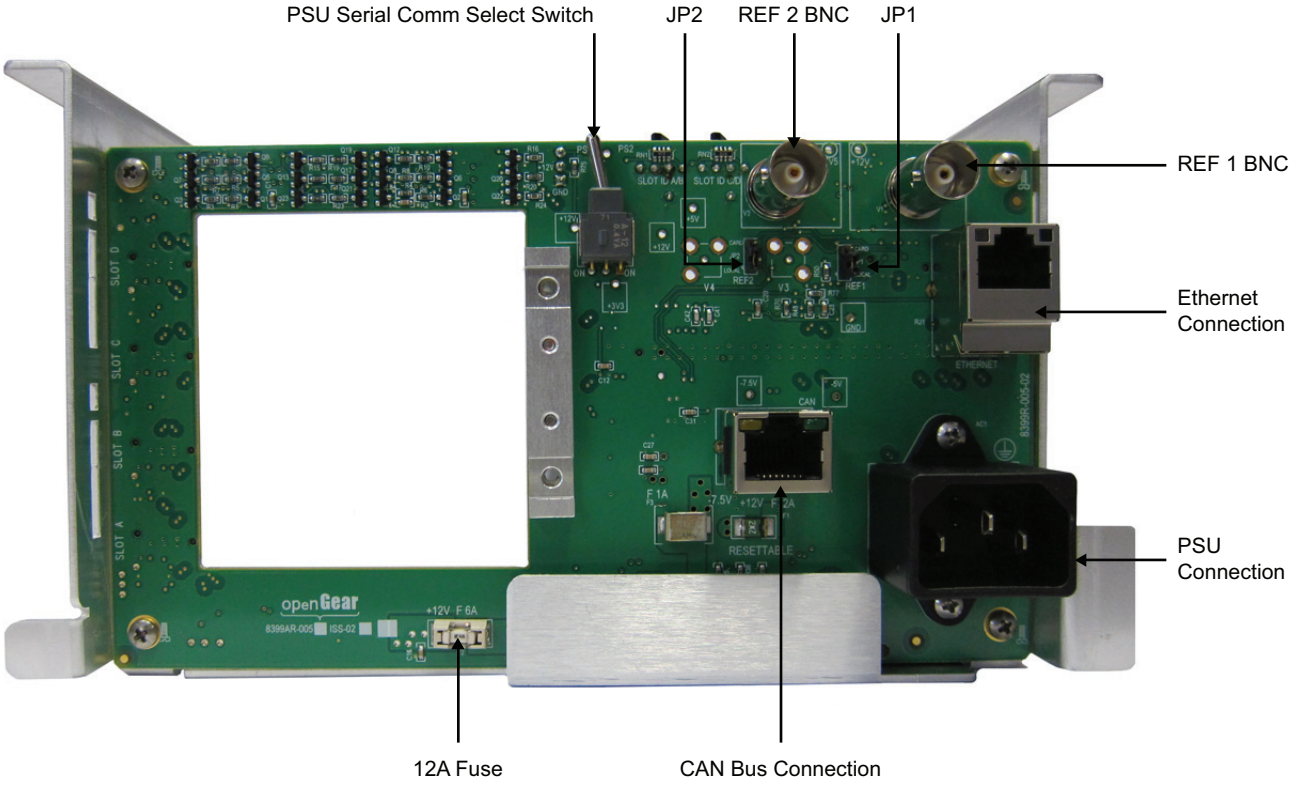

Figure 5.1 OTF-OGX Connections

CAN Bus Connection

This RJ45 connector is used to exchange information data from cards installed in the test fixture to an external monitoring/control system. This is an extension of the CAN bus used for communications within the openGear frame. Only cards having the CAN interface will be able to be monitored and controlled this way. This port is provided to provide a convenient method of monitoring and debugging the CAN bus.

✶ The CAN bus connector is only present on the OTF-OGX and the obsoleted DFR-8310 frames.

Table 5.1 lists the pinouts for the CAN Bus connector.

Table 5.1 CAN Bus Connector Pinouts

Pin	Function
1	CAN_P
2	CAN_N
3	No connection

Table 5.1 CAN Bus Connector Pinouts

Pin	Function
4	+12V (with resettable 0.2A fuse)
5	
6	No connection
7	GND
8	

Ethernet Connection

This RJ45 connector is used to connect the MFC-OG3-N or MFC-8322-S to an external Ethernet network. This standard 10/100/1000 Base-TX RJ45 Ethernet connector is used to exchange information with an external monitoring/control system over an Ethernet network. Only openGear cards with a CAN interface or internal GigE interface will be able to be monitored and controlled this way.

- The MFC-OG3-N supports 10/100/1000 Base-TX while the MFC-8322-S supports 10/100 Base-TX. Refer to the ***openGear Hardware Development Guide*** for details.
- Use up to 100m of CAT-5 Fast Ethernet cable, or better, to connect the frame to an external Ethernet hub or switch.
- The Ethernet port does not provide Power-over-Ethernet (PoE).

REF 1, REF 2 BNCs

Two BNC inputs are provided to accept two independent reference signals, of the following formats:

- Composite black
- Tri-level sync
- AES/DARS reference

This feature distributes one or two reference signals to all cards in the OTF-OGX. 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.

- Unlike the openGear frames, the reference BNCs on the OTF-OGX are terminated to 75ohm (e.g. no loop-through capability). The reference distribution circuitry on the OTF-OGX is the same as in the DFR-8321, OG3-FR, and OGX-FR frames respectively. Refer to the ***openGear Hardware Development Guide*** for more information.

Using the GFC-8322 Reference Card

If you wish to insert a GFC-8322 in the OTF-OGX, you must set **JP1** and **JP2** to the Card position to access the reference signals on the card. Refer to the section "**Reference Source Jumpers (JP1, JP2)**" on page 24 for details on setting these jumpers when using the GFC-8322.

For More Information on...

- the GFC-8322, refer to the ***openGear Hardware Development Guide*** and the ***OGX-FR Series User Guide***.

Auxiliary 12V Power Connection

The OTF-OGX provides an auxiliary 12V connection from the power supply which can be used to power other equipment, such as an impact cooling fan. The connector and test points are located above the Frame Controller Card as shown in **Figure 5.2**. The header and test points are also marked on the PCB silkscreen.

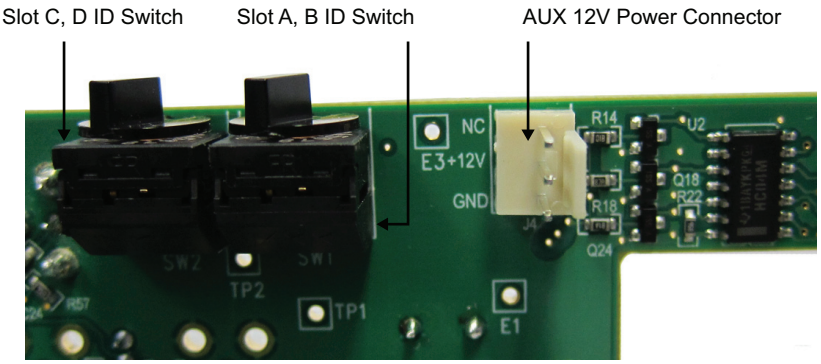

Figure 5.2 AUX 12V Power Connector

The connector is a 0.100” locking header, with the following pinouts.

✶ Pin 1 is towards the bottom of the OTF-OGX.

Table 5.2 AUX 12V Header Pinout

Pin	Function
1	Ground
2	+12V
3	No connection

Optional Rear Modules

The OTF-OGX has positions for two rear modules (an upper module and a lower module), or one four-slot rear module.

- The lower position is designed to align with Slots A and B.
- The upper position is designed to align with Slots C and D.

For More Information on...

- the available rear modules, refer to the ***openGear Hardware Development Guide***.

User Controls

This chapter summarizes the hardware components on the OTF-OGX. Refer to **Figure 6.1** for the location of the switches and LEDs.

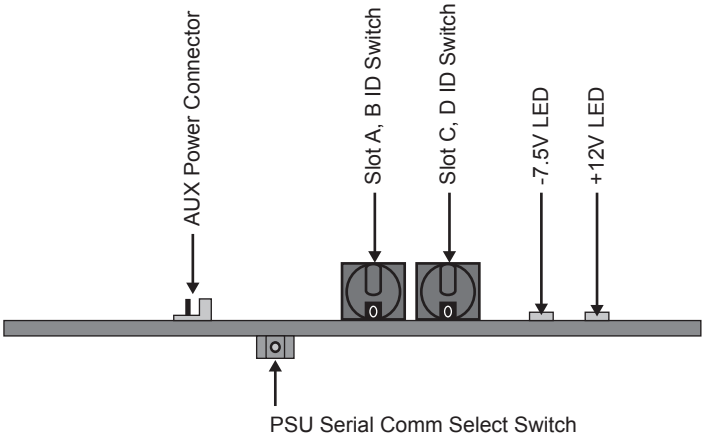

Figure 6.1 OTF-OGX User Controls

Slot ID Switches

The Slot ID switches will select different slot ID resistor values on the midplane connector, to be used by the processing card, to determine the slot it is plugged into.

On the OTF-OGX, there are two rotary switches, one for each double card slot.

- Slot A + B ID Switches — select resistor values corresponding to Slots 1 to 9 for Slot A, and 2 to 10 for Slot B.
- Slot C + D ID Switches — select resistor values corresponding Slots 11 to 19 for Slot C, and 12 to 20 for Slot D.

There is no way to select the same ID for duplicate slots. Slots A and C will always have an odd-numbered Slot ID and Slots B and C will always have an even-numbered Slot ID as in the OGX-FR frame.

✶ Slot ID switches do NOT change the Ethernet slot location. Ethernet connections to the MFC-OGX-N are fixed. Ensure that if Ethernet connectivity to each card is Slot ID dependent, set both Slot ID switches to the 0 position.

Refer to **Table 6.1** when using the Slot ID switches.

Table 6.1 Slot ID Switches — Settings

Slot ID Switch Setting	Slot ID			
	A	B	C	D
0	1	2	11	12
1	3	4	13	14
2	5	6	15	16
3	7	8	17	18
4	9	10	19	20
5	9	10	19	20
6	9	10	19	20
7	9	10	19	20
8	1	2	11	12

Table 6.1 Slot ID Switches — Settings

Slot ID Switch Setting	Slot ID			
	A	B	C	D
9	3	4	13	14
A	5	6	15	16
B	7	8	17	18
C	9	10	19	20
D	9	10	19	20
E	9	10	19	20
F	9	10	19	20

Ethernet (GigE) to Card Connectivity

Every slot has an ethernet connection to the Frame Controller Card. Slot A is equal to Ethernet Connection 1, Slot B is equal to Ethernet Connection 2, Slots C is equal to Ethernet Connection 11, and Slot D is equal to Ethernet Connection 12.

Refer to the ***openGear Hardware Development Guide*** for more information.

PSU Serial Communication Select Switch

Unlike the openGear frame, the OTF-OGX only supports a single power supply. The PSU Serial switch selects the communications path between the Frame Controller Card and the installed PS-OGX.

With the PCB front edge facing you, use the following switch toggle options to select the communications path to the Frame Controller Card:

1. Toggling the switch to position **PS1** selects the **PSU 1** communication path.
2. Toggling the switch to position **PS2** selects the **PSU 2** communication path.

Reference Source Jumpers (JP1, JP2)

The OTF-OGX includes the same buffer hardware as the Reference Card (GFC-8322). **JP1** and **JP2** on the OTF-OGX backplane enables you to select whether the reference signals will be buffered locally on the jig or buffered on the GFC-8322.

If you are using the GFC-8322 in the OTF-OGX, setting **JP1** and **JP2** to:

- **Card** — allows the reference signals to be buffered on the GFC-8322.
- **Local** — selects the reference buffers on the OTF-OGX. This allows the OTF-OGX to operate normally without the presence of the GFC-8322.

LEDs

The back of the OTF-OGX features LEDs that display the status of the power supply. LED displays and descriptions are provided in **Table 6.2**.

✶ The -7V uses a resettable fuse. The +12V has a replaceable fuse.

Table 6.2 LED Display — Description

LED	Color	Description
+12V	Green	When lit, this LED confirms that the power supply is generating a +12V output to the OTF-OGX.
	Off	If this LED is unlit, verify that you have not blown a fuse.
-7V	Green	When lit, this LED confirms that the power supply is generating a -7V output to the OTF-OGX.
	Off	If this LED is unlit, there is a short on the -7V rail.

Technical Specifications

This chapter provides technical information for OTF-OGX.

✶ Specifications are subject to change without notice.

Dimensions

Table 7.1 Technical Specifications — OTF-OGX Dimensions

Item	Specifications
Height	4.06” (10.3cm)
Width	7.693” (19.5cm)
Depth	14.3” (36.3cm) including PS-OGX

openGear Card Slot(s)

Table 7.2 Technical Specifications — Card Slots

Item	Specifications
Number of Slots	4
Total Power Available	500W
Maximum Card Power	
High-density (Split) Rear Module[a]	15W per card
Standard Rear Module[b]	30W per card[c]
Double-wide Rear Module[d]	60W per assembly[e,f]

a. Accommodates two openGear cards and requires two slots in the frame chassis.
b. Accommodates one openGear card and requires two slots in the frame chassis.
c. Or 45W if the openGear card has integrated cooling.
d. Accommodates one or two openGear cards and requires four slots in the frame chassis.
e. Or 75W for a single card with integrated cooling.
f. Or 90W for a multi-slot assembly with integrated cooling and receiving power from two or more midplane connectors.

Frame Controller Card Slot

Table 7.3 Technical Specifications — Frame Controller Slot

Item	Specifications
Max. Power: +12V Rail	3A, 36W
Max. Power: -7.5V Rail	0.2A (1.5W)
Total	37.5W maximum

CAN Bus Connector Power Feed

Table 7.4 Technical Specifications — CAN Bus Remote Power

Item	Specifications
Max. Power: +12V Rail	0.2A re-setable fuse

Reference Inputs

Table 7.5 Technical Specifications — Reference Inputs

Item	Specifications
Number of Inputs	2 terminating
Level	1V pp nominal
Signal	Analog video sync (black burst or tri-level), or AES/EBU DARS
Impedance	75ohm terminating
Return Loss	>30dB to 30MHz
Maximum DC on REF Input	±1V

Environment

Table 7.6 Technical Specifications — Environment

Item	Specifications
Maximum Ambient Temperature	5°C to 40°C (41°F to 104°F)
Humidity, non-condensing	<95%

PS-OGX Power Supply

Table 7.7 Technical Specifications — PS-OGX

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

Service Information

Routine maintenance to this OTF-OGX is not required. In the event of problems with your OTF-OGX, the following basic troubleshooting checklist may help identify the source of the problem. If the OTF-OGX still does not appear to be working properly after checking all possible causes, please contact your openGear products distributor, or the Technical Support department at the numbers listed under the "**Contacting Technical Support**" on page 10.

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 jig, and any associated peripheral equipment for signs of trouble.
2. **Power Check —** Inspect the power indicator LED on the OTF-OGX 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. Verify that the 12V fuse is not blown.
3. **Re-seat the Card(s)** — Eject the openGear card and re-insert it in the OTF-OGX.
4. **Input Signal Status** — Verify that source equipment is operating correctly and that a valid signal is being supplied.
5. **Output Signal Path** — Verify that destination equipment is operating correctly and receiving a valid signal.
6. **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.

Warranty and Repair Policy

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

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

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

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

In Case of Problems

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

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

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