



ASI-310 User Guide

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 - offer the best product quality and support
2. Make Cool Practical Technology
 - develop great products that customers love

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If anything at all with your Ross experience does not live up to your expectations be sure to reach out to us at solutions@rossvideo.com.

A handwritten signature in black ink that reads "David Ross". The signature is stylized, with the first letters of the first and last names being capitalized and prominent.

David Ross
CEO, Ross Video
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Ross Video Code of Ethics

Any company is the sum total of the people that make things happen. At Ross, our employees are a special group. Our employees truly care about doing a great job and delivering a high quality customer experience every day. This code of ethics hangs on the wall of all Ross Video locations to guide our behavior:

1. We will always act in our customers' best interest.
2. We will do our best to understand our customers' requirements.
3. We will not ship crap.
4. We will be great to work with.
5. We will do something extra for our customers, as an apology, when something big goes wrong and it's our fault.
6. We will keep our promises.
7. We will treat the competition with respect.
8. We will cooperate with and help other friendly companies.
9. We will go above and beyond in times of crisis. *If there's no one to authorize the required action in times of company or customer crisis - do what you know in your heart is right. (You may rent helicopters if necessary.)*

ASI-310 · User Guide

- Ross Part Number: 8200DR-310-05
- Release Date: June 5, 2020.

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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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Safety Notices

Refer to the “**Important Regulatory and Safety Notices**” document that accompanied your product.

Statement of Compliance

This product has been determined to be compliant with the applicable standards, regulations, and directives for the countries where the product is marketed.

Compliance documentation, such as certification or Declaration of Compliance for the product is available upon request by contacting techsupport@rossvideo.com. Please include the product; model number identifiers and serial number and country that compliance information is needed in request.

EMC Notices

US FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a Commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio

communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Notice — *Changes or modifications to this equipment not expressly approved by Ross Video Ltd. could void the user's authority to operate this equipment.*

Canada

This Class “A” digital apparatus complies with Canadian ICES-003 and part 15 of the FCC Rules.

Cet appareil numérique de la classe “A” est conforme à la norme NMB-003 du Canada.

European Union

This equipment is in compliance with the essential requirements and other relevant provisions established under regulation (EC) No 765/2008 and Decision No 768/2008/EC referred to as the “New Legislative Framework”.



Warning — *This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.*

Australia/New Zealand

This equipment is in compliance with the provisions established under the Radiocommunications Act 1992 and Radiocommunications Labeling (Electromagnetic Compatibility) Notice 2008.

Korea

This equipment is in compliance with the provisions established under the Radio Waves Act.

Class A equipment (Broadcasting and communications service for business use)

This device is a business-use (Class A) EMC-compliant device. The seller and user are advised to be aware of this fact. This device is intended for use in areas outside home.

Type of Equipment	User's Guide
A급 기기 (업무용 방송통신기자재)	이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.
Class A Equipment (Industrial Broadcasting & Communication Equipment)	This equipment is Industrial (Class A) electromagnetic wave suitability equipment and seller or user should take notice of it, and this equipment is to be used in the places except for home.

International

This equipment has been tested under the requirements of CISPR 22:2008 or CISPR 32:2015 and found to comply with the limits for a Class A Digital device.

Notice — *This is a Class A product. In domestic environments, this product may cause radio interference, in which case the user may have to take adequate measures.*

Maintenance/User Serviceable Parts

Routine maintenance to this openGear product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the “**Contact Us**” section of this manual. All openGear products are covered by a generous 5-year warranty

and will be repaired without charge for materials or labor within this period. See the “**Warranty and Repair Policy**” section in this manual for details.

Environmental Information

The equipment may contain hazardous substances that could impact health and the environment.

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

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



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

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Introduction

This guide provides an overview of the ASI-310 ASI to SMPTE 310 and SMPTE 310 to ASI Converter. 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 ASI-310.
- “**Hardware Overview**” provides an overview of the ASI-310 hardware components.
- “**Physical Installation**” provides instructions for the physical installation of the ASI-310 card and its rear module into an openGear frame.
- “**Configuration**” explains how to use the options in DashBoard to set up the ASI-310.
- “**Upgrading the Software**” provides instructions for upgrading the ASI-310 software via DashBoard.
- “**Technical Specifications**” provides the technical specification information for the ASI-310.
- “**Service Information**” provides information on the warranty and repair policy for your ASI-310.
- “**Glossary**” provides a list of terms used throughout this guide.

Related Publications

It is recommended to consult the following Ross documentation before installing and configuring your ASI-310:

- ***DashBoard User Guide***, Ross Part Number: 8351DR-004
- ***MFC-OG3-N and MFC-8322-S User Guide***, Ross Part Number: 8322DR-004
- ***OGX-FR Series Quick Start Guide***, Ross Part Number: 8322DR-202
- ***OGX-FR Series User Guide***, Ross Part Number: 8322DR-204

Documentation Conventions

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

Interface Elements

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

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

User Entered Text

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

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

Referenced Guides

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

For more information, refer to the ***DashBoard User 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 ASI-310 accepts a DVB-ASI input containing an MPEG 2 Transport Stream, and produces a SMPTE 310M Transport Stream output at one of two frequencies: 19.392659 or 38.785317Mbps. It also simultaneously accepts a 310M Transport Stream at either of the standard frequencies and produces a DVB-ASI signal.

Overview

The ASI-310 provides a number of innovative tools to simplify your work-flow. For example:

- It allows user setup of the 310M input and output rates to either of the two available frequencies.
- It has an accurate on-board temperature-compensated crystal oscillator that generates a free-running output frequency which meets the specified tolerance of $\pm 2.8\text{ppm}$.
- For applications requiring even tighter frequency tolerance, or to ensure frequency coherence with house sync, the user can provide a 310 input and set the ASI-310 to lock its output bit rate to it.
- The ASI-310 accepts a Transport Stream having a rate much higher or lower than the selected output 310 rate, provided that the net input rate (input rate not including null packets) is less than or equal to the selected 310 rate. If the average input rate is too low, the ASI-310 adds null packets as needed to maintain the output rate; if the input rate is too high, it deletes null packets as needed.
- The ASI-310 provides selectable PCR re-stamping to correct timing errors caused by the insertion or deletion of null packets to achieve the desired 310M output bit rate.
- The included 310-to-ASI converter allows independent simultaneous conversions in both directions.
- The combination of a second 310M output and the 310-to-ASI converter allows in-service monitoring of the 310M output with ASI-based equipment such as the Ross Video TSM-100.
- Error conditions such as loss of input, or a net input rate exceeding the output rate, are reported through the GUI and can be assigned to GPI/O outputs for connection to an external alarm or monitoring system.
- The ASI-310 tolerates any single occurrence of an invalid sync character before declaring loss of sync. Upon loss of sync, caused for example by asynchronous switching of ASI signals, it recovers sync rapidly.

Features

The following features make the ASI-310 the solution of choice for converting MPEG Transport Streams in DVB-ASI format to SMPTE 310M as commonly used in ATSC systems:

- ASI input and two 310 outputs on 75ohm BNC jacks located on the rear module.
- 310M input and ASI output on 75ohm BNC jacks located on the rear module
- Independently selectable 310M input and output rates: 19.392659 or 38.785317Mbps
- Selectable clock source: on-board temperature-compensated crystal oscillator or 310M input
- Rate conversion and PCR re-stamping
- Cards are hot-pluggable for ease of configuration and maintenance.
- Compatible with the openGear frame's SNMP option, allowing monitoring with third-party SNMP software systems
- Fits openGear frames

Functional Block Diagram

This section provides a functional block diagram that outlines the work-flow of the ASI-310.

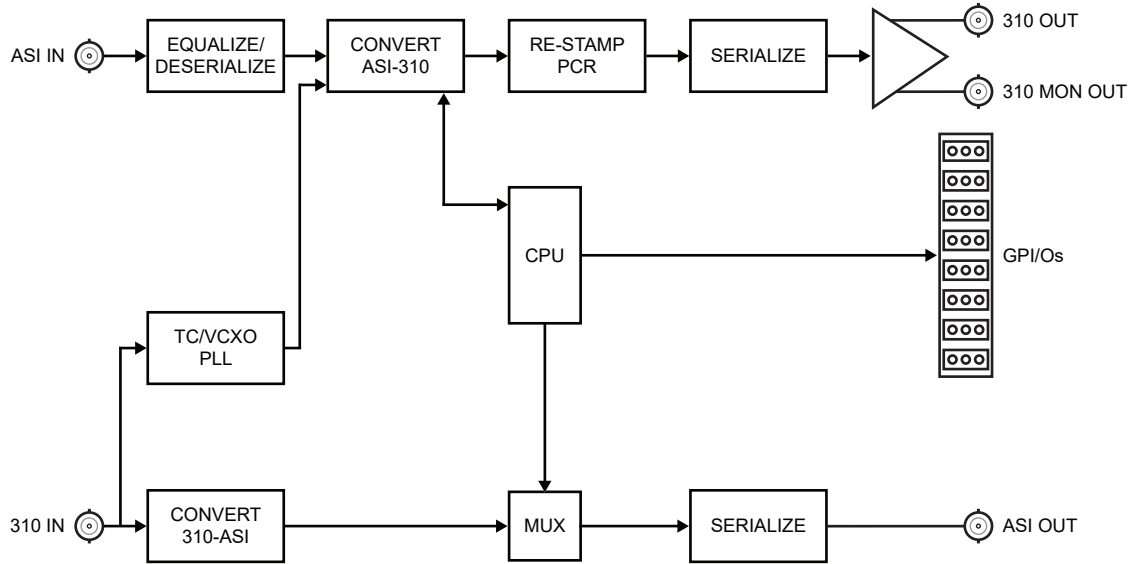


Figure 1.1 Simplified Block Diagram — ASI-310

User Interfaces

The ASI-310 includes the following user interfaces:

DashBoard Control System

DashBoard enables you to monitor and control openGear frames and cards from a computer. DashBoard communicates with other cards in the frame through the Network Controller Card. The DashBoard software and manual are available for download from our website.

For More Information on...

- the ASI-310 menus in DashBoard, refer to the chapter “**Configuration**” on page 23.
- using DashBoard, refer to the ***DashBoard User Guide*** available from our website.

SNMP Monitoring and Control

The Network Controller Card in the openGear frame provides optional support for remote monitoring of your frame and the using Simple Network Management Protocol (SNMP), which is compatible with many third-party monitoring and control tools.

For More Information on...

- the SNMP controls on this card, refer to your ASI-310 Management Information Base (MIB) file.
- SNMP Monitoring and Control, refer to the ***MFC-OG3-N and MFC-8322-S User Guide***.

Hardware Overview

This chapter presents information on the ASI-310 hardware components and features.

Overview

The ASI-310 is an openGear modular system composed of two sub-systems.

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

Main PCB Overview

The main PCB is a typical openGear card. An ejector on one end secures the module to the slot inside the openGear frame, and the other end inserts into a connector on the back of the rear module. This section provides a general overview of the ASI-310 card-edge components.

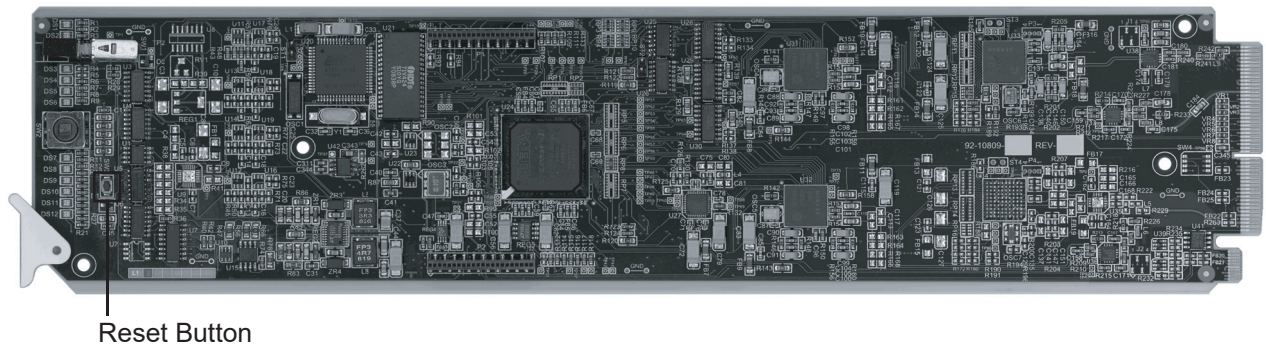


Figure 1.1 ASI-310 — Reset Button

Reset Button (SW3)

This button is used for rebooting the card.

Control and Monitoring

This section summarizes the LEDs on the ASI-310 card-edge. Refer to **Figure 1.2** for the location of the LEDs.

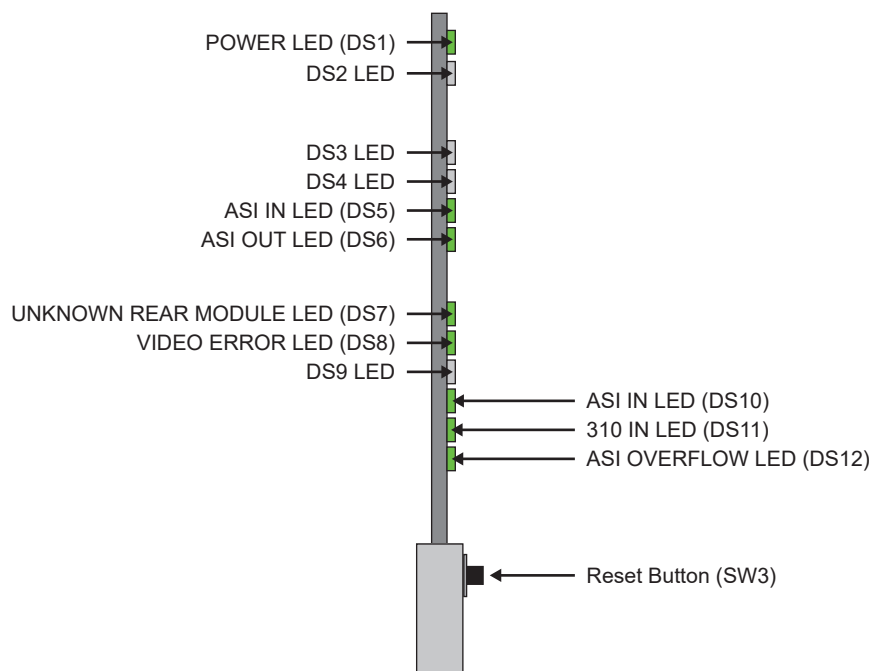


Figure 1.2 ASI-310 Card-edge Controls

Status and Selection LEDs on the ASI-310

The front-edge of the ASI-310 has LED indicators for alarm, and communication activity. Basic LED displays and descriptions are provided in **Table 1.1**.

Table 1.1 LEDs on the ASI-310

LED	Color	Display and Description
POWER (DS1)	Green	When lit green, this LED indicates that the card is running with a valid input.
	Flashing Green	When flashing green, this LED indicates that the bootloader is waiting for a software upload.
	Orange	When lit orange, this LED indicates that an error in the signal or configuration is occurring.
	Red	When lit red, this LED indicates that the card is not operational. This will occur if, for example there is no video input. It also lights red when the OSD is enabled.
	Off	When unlit, this LED indicates there is no power.
DS2	This LED is not implemented.	
DS3	This LED is not implemented.	
DS4	This LED is not implemented.	
ASI IN (DS5)	Green	When lit green, this LED indicates the ASI input is present and valid.
	Red	When red or flashing red, this LED indicates that no valid input is present. This typically means that the input cable is disconnected.
ASI OUT (DS6)	Green	When lit green, this LED indicates that the ASI output has a valid input.
	Red	When lit red, this LED indicates a hardware fault on the card.

Table 1.1 LEDs on the ASI-310

LED	Color	Display and Description
Unknown Rear Module (DS7)	Green	When lit green, this LED indicates the rear module is supported by the card.
	Red	When lit red, this LED indicates that the rear module connected to the ASI-310 is not suitable for use with the ASI-310. Operation will not be correct.
Video Error (DS8)	Green	When lit green, this LED indicates the video is supported by the card.
	Red	When lit red, this LED indicates that the signal connected to the video input is a known type, but is not ASI; for example, it could be SDI or HD-SDI. Operation will not be correct.
DS9		This LED is redundant with DS2.
ASI IN (DS10)		This LED is redundant with DS5.
310 IN (DS11)	Green	When lit green, this LED indicates that there is a valid 310 input.
	Red	When lit red, this LED indicates that there is no 310 input.
ASI OVERFLOW (DS12)	Green	When lit green, this LED indicates that the ASI input throughput is suitable for conversion 310.
	Red	When lit red, this LED indicates insufficient 310 bandwidth to carry contents of ASI signal.

Supported Rear Modules

This section provides cabling diagrams for the rear modules. The type of rear module depends on the frame the card is installed in.

MDL-R10 Rear Module

This rear module is required when installing the ASI-310 in the DFR-8310 series frames. Each **MDL-R10** Full Rear Module accommodates one card and uses two slots. Each **MDL-R10** provides a SMPTE 310M input, an ASI input, a SMPTE 310M monitoring output, one SMPTE 310M output, and an ASI output. (**Figure 1.3**)

★ The ASI-310 is not compatible with the DFR-8310-BNC frames.

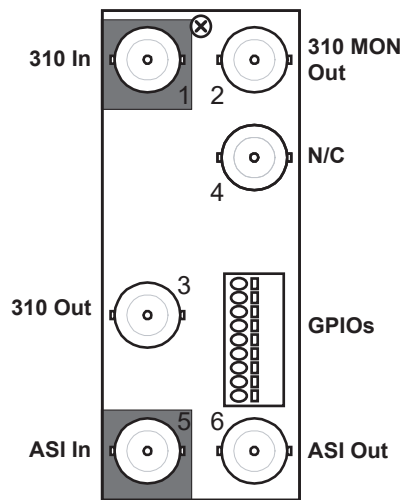


Figure 1.3 Cabling for the MDL-R10 Rear Module

MDL-R20 Rear Module

The **MDL-R20** Rear Module is required when installing the ASI-310 in the DFR-8321 series frame, OG3-FR series frames, and OGX-FR series frames. Each **MDL-R20** Full Rear Module accommodates one card and uses two slots. Each **MDL-R20** provides a SMPTE 310M input, an ASI input, a SMPTE 310M monitoring output, one SMPTE 310M output, and an ASI output. (**Figure 1.4**)

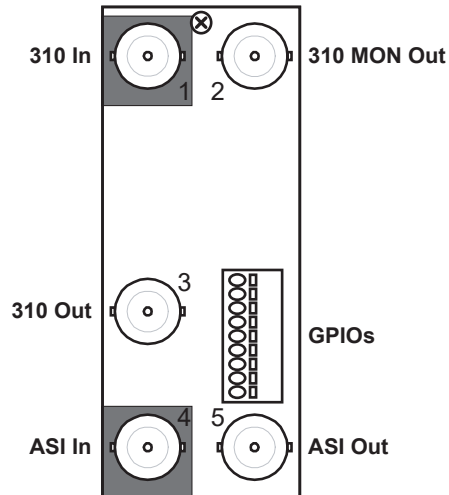


Figure 1.4 Cabling for the MDL-R20 Rear Module

Connections Overview

This section briefly outlines the types of connections available on the rear modules.

310 In — BNC 1

BNC 1 accepts a SMPTE 310M Transport Stream input which can be converted to ASI and/or used as a frequency reference for the 310 output. The input signal is internally terminated in 75ohms when the ASI-310 is installed. When the ASI-310 is removed from the rear module, this input is terminated in the equipment connected to the 310 Out BNC.

ASI In — BNC 4 or BNC 5

BNC 4 (BNC 5 on the MDL-R10) accepts an ASI Transport Stream input for conversion to SMPTE 310M. The input signal is internally terminated in 75ohms when the ASI-310 is installed and unterminated otherwise.

310 Out — BNC 3

BNC 3 carries the SMPTE 310M output produced by conversion of the ASI input. When the ASI-310 is removed from its slot, the rear module bypasses **BNC 1** to **BNC 3** directly.

310 Monitor — BNC 2

BNC 2 carries an inverted copy of the 310 output. When the ASI-310 card is removed from its slot, there is no output from this BNC.

BNC 4 (MDL-R10 only)

This output is not implemented. Do not move it from its default position.

ASI Out — BNC 5 or BNC 6

BNC 5 on the MDL-R20 (**BNC 6** on the MDL-R10) is the output of the 310-to-ASI converter.

GPI/O Outputs

The GPI/O outputs are provided on a nine-pin connector with eight logic outputs (3.3V) and one ground connection. (**Table 1.2**) These GPI/O outputs carry the ASI-310's GPI/O outputs that can be used to control external equipment. Note that the GPI/O outputs are logic signals: the high level is 3.3V and the low level is 0V. Each output is suitable for driving a logic circuit or LED through a short cable. If you need to drive high-current or high-voltage loads, or loads that are referenced to a different ground than the ASI-310 card, use an external relay circuit between the GPI/O pin(s) and the load.

Table 1.2 GPI/O Output Pins

Pin	Function
1	GPI/O1
2	GPI/O2
3	GPI/O3
4	GPI/O4
5	GPI/O5
6	GPI/O6
7	GPI/O7
8	GPI/O8
9	Ground

Refer to **Figure 1.5** for pinouts on the MDL-R10 and **Figure 1.6** for pinouts on the **MDL-R20**.



Figure 1.5 GPI/O Pinouts for the MDL-R10



Figure 1.6 GPI Pinouts for the MDL-R20

Physical Installation

This chapter provides instructions for installing the ASI-310 into the openGear frame.

Before You Begin

Before proceeding with the instructions in this chapter, ensure that your openGear frame is properly installed according to the instructions in its manual.

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 ASI-310 you received from the shipping container and ensure that all items are included. If any items are missing or damaged, contact your sales representative or Ross Video directly.

Quick Start

Assuming you have an openGear frame, an ASI-310 card and a suitable rear module, the following steps will get you started with ASI-to-310 conversion:

1. Connect the frame to your LAN. Refer to the **OGX-FR Series User Guide** and the **MFC-OG3-N and MFC-8322-S User Guide** for details.
2. Install DashBoard on a computer connected to the LAN. The DashBoard Control System software and user manual is also available for download from the Ross Video website.
3. Install the rear module in the frame, as described in the section “**Installing a Rear Module**” on page 20.
4. Install the ASI-310 into the rear module, as described in the section “**Installing the ASI-310 in an openGear Frame Slot**” on page 21
5. Connect an ASI signal to the **ASI IN** BNC on the rear module as described in the section “**Connections Overview**” on page 16.
6. Connect the **310 Out** BNC to an appropriate analyzer or other downstream equipment.
7. Power on the frame.
8. Launch DashBoard on your computer. It should automatically find your frame within a minute or two.
9. Click the “+” next to the frame name to show the cards in the frame.
10. Double-click the ASI-310 node to display a Device Editor tab in the DashBoard client.
11. Select the **Settings** tab.
12. Select the **310 bit rate and sync** method. The output should now be a valid 310M signal and the card status in DashBoard should be green, and display “OK”.
13. If desired, connect cables to the **310 IN** and **ASI OUT** jacks.
14. In DashBoard, set the **310 Input rate** and **ASI output mode** as needed.

15. If desired, connect wires from the **GPI/O** jacks on the rear panel to your monitoring equipment, as described in the section “**Connections Overview**” on page 16.

Installing the ASI-310

This section outlines how to install a rear module and card in a openGear frame. Refer to the section “**Connections Overview**” on page 16 for cabling details.

Rear Modules

When installing the ASI-310:

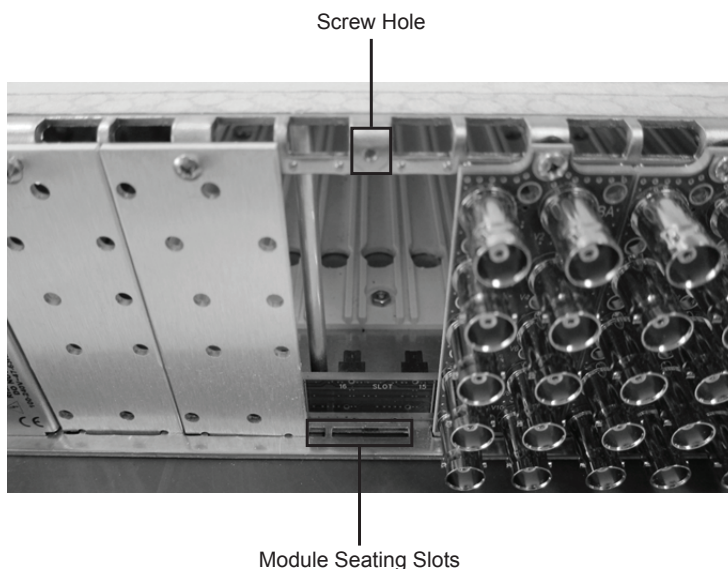
- **DFR-8310 series frames** — The **MDL-R10** Full Rear Module is required. The ASI-310 is not compatible with the DFR-8310-BNC frames.
- **DFR-8321 series frame** and **OG3-FR series frames** — The **MDL-R20** Full Rear Module is required.

Installing a Rear Module

If the Rear Module is installed, proceed to the section “**Installing the ASI-310 in an openGear Frame Slot**” on page 21.

To install a rear module in your openGear frame

1. Locate the card frame slots on the rear of the frame.
2. Remove the Blank Plate from the slot you have chosen for the ASI-310 installation.
3. Install the bottom of the Rear Module in the **Module Seating Slot** at the base of the frame’s back plane.



4. Align the top hole of the Rear Module with the screw on the top-edge of the frame back plane.
5. Using a Phillips screwdriver and the supplied screw, fasten the Rear Module to the back plane of the frame. Do not over tighten.
6. Ensure proper frame cooling and ventilation by having all rear frame slots covered with Rear Modules or Blank Plates.

Installing the ASI-310 in an openGear Frame Slot

Notice — *Heat and power distribution requirements within a frame may dictate specific slot placements of cards. Cards with many heat-producing components should be arranged to avoid areas of excess heat build-up, particularly in frames using convectional cooling.*

To install the ASI-310 card in an openGear frame

1. Locate the Rear Module you installed in the procedure “**Installing a Rear Module**” on page 20.
2. Hold the ASI-310 by the edges and carefully align the card-edges with the slots in the frame.
3. Fully insert the card into the frame until the rear connection plus is properly seated in the Rear Module.
4. Verify whether your label is self-adhesive by checking the back of the label for a thin wax sheet. You must remove this wax sheet before affixing the label.
5. Affix the supplied Rear Module Label to the BNC area of the Rear Module.

Configuration

This chapter explains how to use the options in DashBoard to set up the ASI-310. This discussion is based on the use of DashBoard through a network connection. The order of sections in this chapter follows the work-flow required to setup the ASI-310 for operation. It is recommended that you proceed through the following sections in order to achieve the best possible understanding of the product.

ASI-to-310 Converter Settings

The **ASI to 310** tab provides options for configuring the ASI-to-310 converter feature.

To set up the ASI-to-310 converter

1. Select the **ASI to 310** tab.
2. Use the **310 Output Bit Rate** options to set the output data rate.
3. Use the **Output Packet Size** options to specify the number of bytes per packet in the 310 output.

This is normally 188 bytes, but you can set it to 204 or 208 bytes if needed for your application. If the input packet size is different from the output size you specify, the converter adjusts the number of dummy error-correction bytes appended to the basic 188-byte payload to achieve the desired total packet length.

4. Configure the **PCR Restamping** option.

It should normally be left at the **On** setting, since this minimizes PCR error and jitter in the output. It does this by adjusting the PCR values to account for the slightly variable packet processing delays caused by adding or deleting null packets to maintain the specified output data rate and/or modify the packet size.

5. Set the **310 Output Clock** to either Free-running or Lock to 310 Input.

If you have a high-accuracy high-stability 310 signal available, you can connect it to the 310 Input jack, and set this variable to Lock to 310 Input. Otherwise, it should be set to Free-running which uses an accurate on-board frequency reference to generate the output data rate.

6. Use the **310 Input Bit Rate** to set the 310 reference input data rate. This must be set to the correct value if you have selected Lock to 310 Input as the 310 Output Clock setting, or if you are using the 310-to-ASI converter as discussed in the next section.

★ When the 310-to-ASI converter is active and its input is from the ASI-to-310 converter, it is essential that you set the 310 Output Clock to Free-running. If you set it to Lock to 310 Input, the converter would effectively lock its 310 clock to itself, which would produce unspecified and possibly non-compliant output signals..

310-to-ASI Converter Settings

There are two modes for the 310-to-ASI converter:

- **Packet Mode** — All the bytes of each TS packet are output consecutively, and fill characters (K28.5) are inserted between packets. When there are no bytes ready for transmission, K28.5 characters are transmitted.
- **Byte Mode** — Each SMPTE 310 byte that arrives at the converter input is transmitted on the ASI output as soon as it is ready. The timing and packet size present in the 310 input are preserved exactly in the ASI output. 310 Input Bit Rate sets the 310 input data rate to either 19.39 or 38.78Mbps. This must be set to the correct value if you are using the 310-to-ASI converter. This same variable is available on the **ASI to 310 Settings** tab, since this input can also be used as a frequency reference for the 310 output.

To set up the 310-to-ASI converter

1. Select the **310 to ASI** tab.
2. Use the **Output Packet Size** to adjust the number of bytes per packet in the ASI output.

This is normally 188 bytes, but you can set it as needed for your application. If the input packet size is different from the output size you specify, the converter adjusts the number of dummy error-correction bytes appended to the basic 188-byte payload to achieve the desired total packet length.

3. Use the **310 Input Bit Rate** to set the 310 input data rate. This must be set to the correct value.

GPI/O Settings

Use the following procedure to assign GPI/O outputs to error conditions:

1. Select the **GPI/O** tab.
2. Select the GPI/O that you want to assign from the selector labeled GPI/O.

The eight selections are named GPIO 1 through GPIO 8. If you have renamed the GPI/Os (discussed in the section “**String Settings**” on page 24), the names you have assigned will display in this list instead.

3. Use the provided buttons to select the **Condition** that you want to trigger it.
 - **Active** level is the logic level that is present on the GPI/O output when it indicates an error condition.
 - The default is **High**, but it can be set to **Low** if needed to meet the interface requirements of other equipment.
4. To apply the new settings:
 - a. Click **Accept**.
 - b. Click **Yes**.

String Settings

The **Edit Strings** tab allows you to assign a name to this ASI-310 card, to distinguish it in DashBoard from other cards of the same type. It also lets you assign descriptive names to the GPI/O outputs.

To configure a string

1. Select the **Edit Strings** tab.
2. Enter a unique name in the **Card ID** field. For example, you could change the card ID to “- Main” and as a result, the name displayed for the card on its tab and in the device list is “ASI-310 - Main” instead of just “ASI-310”.
3. Assign each of the GPI/O outputs a description name. This name is used in the GPI/O Status and Alarm Counters status tabs.
4. Apply the new settings as follows:
 - a. Click **Apply**.
 - b. Click **Yes** in the confirmation dialog box.

Alarm Settings

The **Alarms Settings** tab allows you to specify the conditions that are included in the **Card Status** tab and reported through SNMP if enabled on the frame.

To specify the error conditions to report

1. Select the **Alarms Settings** tab.
2. Select the **Unsupported Rear Module** box to report when the ASI-310 does not work properly with the installed rear module; for example, it may be missing connectors that are essential for the ASI-310's operation.
3. Select the **Invalid Video (ASI)** box to report when the ASI input is connected but is not recognized as ASI.

4. Select the **No Video (ASI)** box to report when the ASI input signal is not connected.
5. Select the **No Video (310)** box to report that the 310 input signal is not connected or its data rate is incorrect.
6. Select the **Overflow (ASI)** box to report when the ASI input data rate, minus any nulls, is higher than the 310 Output rate. Consequently, data is being lost from the Transport Stream.
7. Select the **Unknown Rear Module** box to report when the ASI-310 does not recognize this rear module and thus may not work properly. This and the **Unsupported Rear Module** alarm should only occur when a card is first plugged in i.e. before it is put into service.
8. If you do not plan to use the 310-to-ASI converter or the Lock to 310 Input setting of the 310 Output Clock, you should clear the **No Video (310)** box, so that the absence of this input does not cause the card status indicator to be red.
9. If you do not use the ASI-to-310 converter, you should clear the **Invalid Video (ASI)**, **No Video (ASI)** and **Overflow (ASI)** boxes.

Monitoring

This section provides an explanation of the status tabs available when using DashBoard to monitor the ASI-310. For a more complete description of DashBoard and its capabilities, refer to the ***DashBoard User Guide***.

Product Tab

The **Product** tab displays read-only information that is useful in discussing the operation of the card with Ross Video's Technical Support staff.

Alarms Status Tab

The **Alarms** status tab displays the ASI and 310 data rates and 310 null rate, which are the same as those on the **GPIO Status** tab. It also displays the state of each of the monitored conditions. The alarm conditions listed in the **Alarms** status tab are qualified by the selections made on the **Alarms** setup tab.

- **Card Status** — Any error conditions that are enabled on the Alarms setup tab are reported in the Card Status field (red indicator) when they occur. Alarm conditions that are disabled (the corresponding box in the Alarms setup tab is unselected) are not reported in the Card Status field.
- **Incoming ASI** — This field reports the speed and the packet size of the ASI input signal.
- **Incoming SMPTE 310** — This field reports the speed and the packet size of the SMPTE 310 input signal
- **Outgoing 310 NULL Rate** — This field reports the percentage of null packets in the 310 output. If the ASI input data rate is equal to or greater than the 310 output rate, it is essential that it contain enough null packets to allow the output data rate to be maintained by deleting null packets when necessary. If not, the 310 output null rate is at or near 0% and it is likely that the converter will eventually have to delete payload (i.e. non-null) packets due to peaks in the incoming data-rate. This is a major error condition, which normally changes the Card Status indicator to red.
- **Unsupported Rear Module** — This field reports when the ASI-310 does not work properly with this rear module; for example, it may be missing jacks that are essential for the ASI-310's operation.
- **ASI Video Type** — This field reports when the ASI input is connected but is not recognized as ASI.
- **OSD** — This field is not implemented.
- **ASI Video** — This field reports when the ASI input signal is not connected.
- **310 Video** — This field reports when the SMPTE 310 input signal is not connected or its data rate is incorrect.
- **Overflow (ASI)** — This field reports that the ASI input data rate, minus any nulls, is higher than the 310 Output rate. Consequently, data is being lost from the Transport Stream.
- **Unknown Rear Module** — This field reports when the ASI-310 does not recognize this rear module and thus may not work properly.

GPIO Status Tab

The **GPIO Status** tab displays the following read-only information:

- The **Card Status**, **Incoming ASI**, **Incoming SMPTE 310**, and **Outgoing 310 Null Rate** fields report the same information as described in the **Alarm Status** tab.
- The **GPIO 1-8** fields indicate the state of the eight GPI/O outputs. The normal non-error state of these GPI/Os is typically “low”; in this case, any that display “high” indicate a currently existing error condition that you need to investigate.

Alarm Counters Tab

The **Alarm Counters** tab displays the following read-only information:

- The **Card Status**, **Incoming ASI**, **Incoming SMPTE 310**, and **Outgoing 310 Null Rate** fields report the same information as described in the **Alarm Status** tab.
- The **GPIO 1-8** fields indicate the state for each GPI/O that has an alarm condition assigned to it, the number of times that the Alarm condition has occurred since the last time the counters were reset. Since the GPI/Os are associated with error conditions, the **Alarm Counters** tab provides a record of the number and types of errors that have occurred over time. You can clear these counters by clicking the **Alarm Counters Reset** button located on the **Settings** tab.

Resetting the Alarm Counters

The **Settings** tab provides an **Alarm Counters Reset** button. Clicking this button clears the fields in the **Alarm Counters** status tab (located on the left side of the Device View in DashBoard). For more information on the **Alarm Counters** status tab, refer to the section “**Alarm Counters Tab**” on page 26.

Loading the Factory Defaults

Use the **Reset** button to reset all the parameters in the **Settings** tab to the factory default values. Before loading the factory defaults, it is recommended to ensure the DataSafe feature is disabled on the Network Controller card in your frame. Refer to the *MFC-OG3-N and MFC-8322-S User Guide* for details on disabling DataSafe.

Upgrading the Software

Your ASI-310 can be upgraded in the field via DashBoard.

To upgrade the software on a ASI-310

1. Contact Ross Technical Support for the latest software version file.
 2. Launch the DashBoard client on your computer.
 3. Display a tab for the card you wish to upgrade by double-clicking its status indicator in the **Basic Tree View**.
 4. From the **Device** tab, click **Upload** to display the **Select File for upload** dialog.
 5. Navigate to the *.bin upload file you wish to upload.
 6. Click **Open** and follow the on-screen instructions.
 7. Click **Finish** to start the upgrade.
 8. Monitor the upgrade.
 - A **Upload Status** dialog enables you to monitor the upgrade process.
 - The card reboots automatically once the file is uploaded. The card is temporarily taken off-line.
 - The reboot process is complete once the status indicators for the **Card State** and **Connection** return to their previous status.
- ★ If you are running DashBoard version 2.3.0 or lower, you must click **Reboot** in the **Device** tab to complete the upgrade process.

Technical Specifications

This chapter provides the technical specification information for the ASI-310.

★ Technical specifications are subject to change without notice.

Table 5.1 ASI-310 Technical Specifications

Category	Parameter	Specification
Transport Stream Inputs	Number of Inputs	2
	Signal Standards Accommodated	1 input: DVB-ASI (EN 50083-9) 1 input: SMPTE 310
	Impedance	75ohm terminating
	Equalization	Over 150m (500ft) of Belden 1694A cable
	Return Loss	>15dB to 270MHz
Transport Stream Outputs	Number of Outputs	3
	Signal Standards Accommodated	2 outputs: SMPTE 310 1 output: DVB-ASI (dual-purpose with 259M OSD)
	Impedance	75ohm
	Return Loss	>10dB to 270MHz
	Signal Level	800mV $\pm$ 10%
	DC Offset	0Volts $\pm$ 50mV
	Rise and Fall Time (20-80%)	750ps typical
	Overshoot	<8%
	Jitter	<250ps
	SMPTE 310 free running bit rate	19,392,658 or 38,785,317 bits/sec $\pm$ 2.8ppm
GPI/O Outputs	Number and type of outputs	8 logic outputs (3.3v) and 1 ground
Power	Max. Power Consumption	5W

Service Information

Troubleshooting Checklist

Routine maintenance to this openGear product is not required. In the event of problems with your ASI-310, the following basic troubleshooting checklist may help identify the source of the problem. If the frame still does not appear to be working properly after checking all possible causes, please contact your openGear products distributor, or the Technical Support department at the numbers listed under the “**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. **Re-seat the Card in the Frame** — Eject the card and re-insert it into the frame.
4. **Check Control Settings** — Refer to the Installation and User Controls sections of this manual to verify all user-adjustable component settings
5. **Input Signal Status** — Verify that source equipment is operating correctly and that a valid signal is being supplied.
6. **Output Signal Path** — Verify that destination equipment is operating correctly and receiving a valid signal.
7. **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 ASI-310 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 ASI-310 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 ASI-310 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 ASI-310 User Guide provides all pertinent information for the safe installation and operation of your openGear Product. Ross Video policy dictates that all repairs to the ASI-310 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 ASI-310, 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 ASI-310. If required, a temporary replacement frame will be made

available at a nominal charge. Any shipping costs incurred will be the responsibility of you, the customer. All products shipped to you from Ross Video Limited will be shipped collect.

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

Glossary

The following terms are used throughout this guide:

Active image — the portion of the video picture area (production aperture) that is being utilized for output content. Active image excludes letterbox bars and pillar-box bars.

Card — openGear terminal devices within openGear frames, including all components and switches.

CBR — constant bit rate.

CDN — content distribution network.

DashBoard — the DashBoard Control System.

DF — Differentiated Services.

DTVCC captions — CEA-708 captions.

Frame — the OGX-FR frame that houses the ASI-310.

GPIO — the DC signals used by one device to control another (General Purpose Input-Output).

Metadata — some of the VANC data that the ASI-310 monitors (such as closed captioning) is “data essence”, not metadata. For convenience, this manual uses the term “metadata” to refer to all VANC data types.

MIB — management information base.

Network Controller Card — the MFC-OG3-N and any available options unless otherwise noted.

NTSC captions — the CEA-608-D: Line 21 Data Services captions.

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

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

PCR — program clock reference.

PID — packet identifier.

Production aperture — the image lattice that represents the maximum possible image extent in a given standard (e.g. the full size of all active pixels and active lines). For example, the 1080i production aperture would be 1920x1080.

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

TPG — Test Packet Generator.

User — the person who uses the ASI-310.

VANC — refers to the Vertical Ancillary Data space of a serial digital video signal, and is defined by SMPTE 291M.

