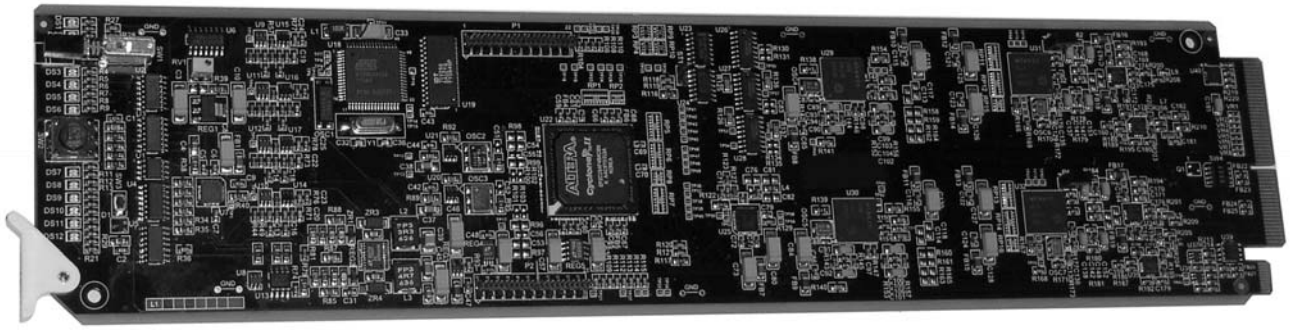
Ross Video Limited

ASI-310

ASI to SMPTE 310 and SMPTE 310 to ASI Converters

User Manual



ROSS
Live Production Technology

openGear

ASI-310 • ASI to SMPTE 310 and SMPTE 310 to ASI Converters User Manual

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Trademarks

Important Regulatory and Safety Notices

Before using this product and any associated equipment, refer to the “Important Safety Instructions” listed below so as to avoid personnel injury and to prevent product damage.

Products may require specific equipment, and/or that installation procedures be carried out to satisfy certain regulatory compliance requirements. Notices have been included in this publication to call attention to these Specific requirements.

Symbol Meanings

This symbol on the equipment refers you to important operating and maintenance (servicing) instructions within the Product Manual Documentation. Failure to heed this information may present a major risk of damage or injury to persons or equipment.

Warning

The symbol with the word **“Warning”** within the equipment manual indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.

Caution

The symbol with the word “**Caution**” within the equipment manual indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Notice

The symbol with the word “**Notice**” within the equipment manual indicates a situation, which if not avoided, may result in major or minor equipment damage or a situation which could place the equipment in a non-compliant operating state.

ESD Susceptibility

This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from electrostatic discharge.

Important Safety Instructions

Caution

This product is intended to be a component product of the openGear 8000 series frame. Refer to the openGear 8000 series frame User Manual for important safety instructions regarding the proper installation and safe operation of the frame as well as its component products.

Warning

Certain parts of this equipment namely the power supply area still present a safety hazard, with the power switch in the OFF position. To avoid electrical shock, disconnect all A/C power cords from the chassis' rear appliance connectors before servicing this area.

Warning

Service barriers within this product are intended to protect the operator and service personnel from hazardous voltages. For continued safety, replace all barriers after any servicing.

This product contains safety critical parts, which if incorrectly replaced may present a risk of fire or electrical shock. Components contained within the product’s power supplies and power supply area, are not intended to be customer serviced and should be returned to the factory for repair.

To reduce the risk of fire, replacement fuses must be the same type and rating.

Only use attachments/accessories specified by the manufacturer.

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 users will be required to correct the interference at their 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.

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

EUROPE

This equipment is in compliance with the essential requirements and other relevant provisions of **CE Directive 93/68/EEC**.

INTERNATIONAL

This equipment has been tested to **CISPR 22:1997** along with amendments **A1:2000** and **A2:2002** 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 on the last page of this manual.

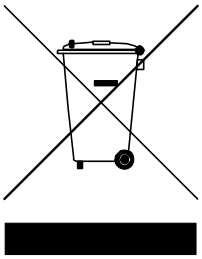
Environmental Information

The ASI-310 complies with the European Union's RoHS Directive. This stands for "the restriction of the use of certain hazardous substances in electrical and electronic equipment". This Directive bans the placing on the EU market of new electrical and electronic equipment containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants.

The equipment that you purchased required the extraction and use of natural resources for its production. Despite compliance with the RoHS directive, it may nevertheless 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, we encourage 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.

Contents

Introduction

In This Chapter

This chapter contains the following sections:

- Overview
- Features
- Reference Documents
- Functional Block Diagram
- Documentation Terms
- Quick Start

A Word of Thanks

Congratulations on choosing the openGear ASI-310 ASI to SMPTE 310 and SMPTE 310 to ASI Converters. The ASI-310 is part of a full line of Digital Products within the openGear Terminal Equipment family of products.

You will be pleased at how easily your new ASI-310 fits into your overall working environment. Equally pleasing is the product quality, reliability and functionality. Thank you for joining the group of worldwide satisfied Ross Video customers!

Should you have a question pertaining to the installation or operation of your ASI-310, please contact us at the numbers listed on the back cover of this manual. Our technical support staff is available for consultation or service.

Overview

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 standard frequencies: 19.392659 or 38.785317 Mbits/sec. It also simultaneously accepts a 310M Transport Stream at either of the standard frequencies and produces a DVB-ASI signal.

The ASI-310 provides a number of innovative tools to simplify your workflow. 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 ± 2.8 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 GPIO 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.
- As a member of the openGear family, the ASI-310 shares a common control interface, known as DashBoard, with a broad array of other products.
- A variety of optional rear connector modules provide GPIO outputs, 310 bypass relay or double card density (up to 20 per frame).

For maximum flexibility of configuration, the ASI-310 also provides a Heads-Up Display on an analog video output. When activated, card status and parameters can be viewed and adjusted using the card-mounted finger joystick and an easy to use menu system.

The ASI-310 is housed in the openGear DFR-8300 series frames. It is compatible with both 10-slot and 20-slot frames.

Features

The following features make 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 75-ohm BNC jacks located on the rear module.
- 310M input and ASI output on 75-ohm BNC jacks located on the rear module.

- Independently selectable 310M input and output rates: 19.392659 or 38.785317 Mbps.
- Selectable clock source: on-board temperature-compensated crystal oscillator or 310M input.
- Rate conversion and PCR re-stamping
- Non-volatile settings allow "set-and-forget" operation.
- Individual GPIOs on ONG-MDL-R01 rear module can be used to indicate error conditions.
- Fits openGear DFR-8300 series frames, allowing up to 20 converters or other functions in a single 20-slot frame, or 10 in a 10-slot frame.
- 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. For more information and to obtain Ross Video's MIBs, visit the Ross Video website.

Reference Documents

The following documents define the DVB-ASI and SMPTE 310 data formats supported by this module:

- "Cable networks for television signals, sound signals and interactive services – Part 9: Interfaces for CATV/SMATV head ends and similar professional equipment for DVB/MPEG-2 transport streams", CENELEC EN 50083-9.
- "Synchronous Serial Interface for MPEG-2 Digital Transport Stream", SMPTE 310M.

Functional Block Diagrams

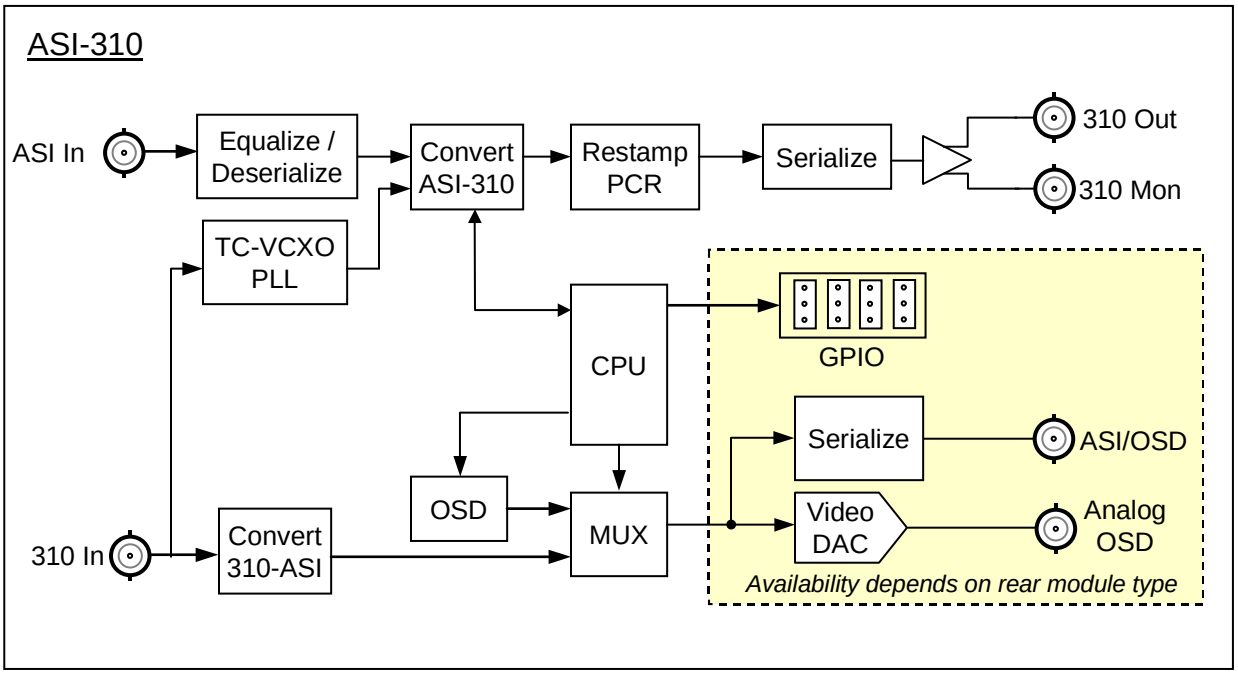
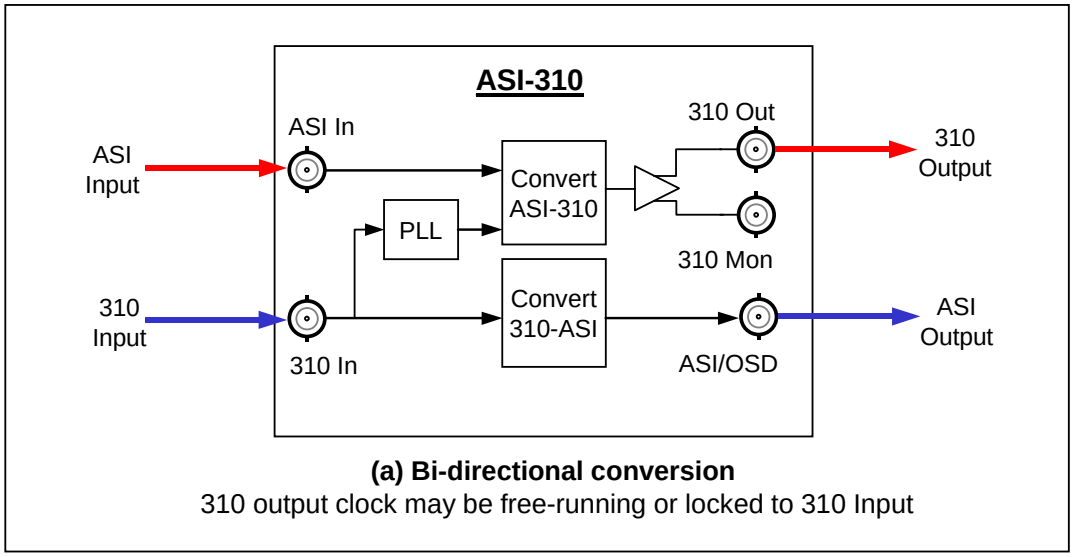
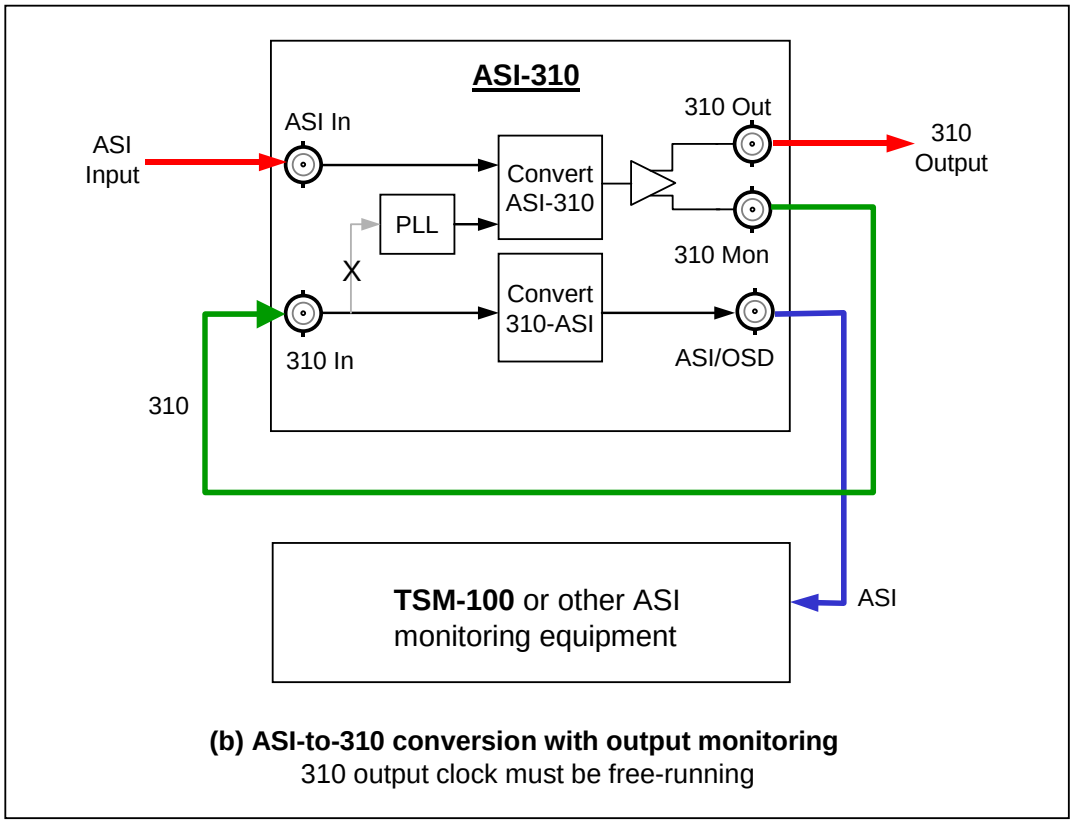


Figure 1: Simplified Block Diagram of ASI-310 Functions



(a) Bi-directional conversion
310 output clock may be free-running or locked to 310 Input



(b) ASI-to-310 conversion with output monitoring
310 output clock must be free-running

Figure 2: ASI-310 Applications

Documentation Terms

The following terms are used throughout this guide:

- "**Frame**" refers to the frame that houses the ASI-310 card.
- "**Operator**" and "**User**" refer to the person who uses the ASI-310.
- "**Board**" and "**Card**" refer to the ASI-310 card itself, including all components and switches.
- "**System**" and "**Video system**" refer to the mix of interconnected production and terminal equipment in which the ASI-310 operates.
- "**Rear Module**" refers to the connector module at the rear of the frame, into which the ASI-310 is inserted.
- "**GPIO**" means General Purpose Input-Output. This term is commonly used in the broadcast industry to refer to DC signals used by one device to control another.

Frame and Rear Module Compatibility

The ASI-310 can operate with the following frame and rear modules combinations.

Table 1.Combinations of ASI-310, Frame and Rear Module models

Rear Module	Frame	Bi-Directional GPIOs	ASI-310 cards per rear module	Bypass Relay
ONG-MDL-R01	DFR-8310-N	Yes	1	Y
ONG-MDL-R21	DFR-8321-C or –CN or -CNS	Yes	1	Y
ONG-MDL-R25	DFR-8321-C or –CN or -CNS	No	2	N

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, using the instruction sheet "**Connecting the openGear Frame to a Network**", supplied with the frame.
2. Install DashBoard on a computer connected to the LAN. The DashBoard Control System™ software and user manual is also available for download.
3. Install the rear module in the frame, as described in the section "**Rear Module Installation"** of this manual.
4. Install the ASI-310 into the rear module, as described in the section "**Board Installation"** of this manual.
5. Connect an ASI signal to the ASI In jack on the rear module as described in the section "**Cable Connections**" of this manual.
6. Connect the 310 Out jack to an appropriate analyzer or other downstream equipment, and turn the frame power on.
7. Start DashBoard on your computer. It should automatically find your frame within a minute or two. Click the "+" next to the frame name to show the cards in the frame, then double-click the ASI-310.
8. The display should be similar to the one in the DashBoard Interface section of this manual.
9. Click the **Settings** tab. 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, which is "OK".
10. If desired, connect cables to the 310 In and ASI Out jacks. Set the 310 Input rate and ASI output mode as needed.
11. If desired, connect wires from the GPIO jacks on the rear panel to your monitoring equipment, as described in the section "**GPIO Outputs"** of this manual.

Installation and Setup

In This Chapter

This chapter contains the following sections:

- Static Discharge
- Unpacking
- Rear Module Installation (Optional)
- Board Installation
- BNC Labels
- Cable Connections

Static Discharge

Whenever handling the ASI-310 and other related equipment, please observe all static discharge precautions as described in the following 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 wearing synthetic fiber clothing. 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 check the contents against the packing list to ensure that all items are included. If any items are missing or damaged, contact your sales representative or Ross Video Ltd. directly.

Rear Module Installation

The openGear frame provides either a single bank of 100 BNC connectors or slots for ten individual rear modules. The ASI-310 operates correctly with the all-BNC model and with either of the following rear modules: RM-8300-B and ONG-MDL-R01. Only the R01 provides GPIO outputs, however. For ordering information, see the inside back cover of this manual. Figure 3 shows two rear modules mounted on an openGear frame. If you received a rear module with your ASI-310, you will need to install it in your frame before you can install the ASI-310 itself or connect cables to the slot you have chosen for it.

Use the following procedure to install the rear module in an openGear digital distribution frame:

1. Refer to the ***DFR-8300 Series Frames User Manual*** to ensure that the frame is properly installed according to instructions.
2. On the rear of the frame, locate the card frame slot.
3. Remove the Blocker Plate (if any) from the rear of the slot you have chosen for the ASI-310 installation. Retain the plate for possible future use.
4. Seat the bottom of the rear module in the seating slot at the base of the frame's back plane.
5. Align the top hole of the rear module with the screw hole on the top edge of the frame.

Figure 3: Rear Module Installation, showing RM-8300-B (left) and ONG-MDL-R01 (right) modules

6. Using a Phillips screwdriver and the supplied screw, fasten the rear module to the back plane. Do not over tighten.
7. Ensure proper frame cooling and ventilation by having all rear frame slots covered with rear I/O modules or blank metal plates. If you need blanks, contact your openGear sales representative.

This completes the procedure for installing the Rear I/O Module in an openGear digital distribution frame.

Board Installation

Use the following procedure to install the ASI-310 in an openGear distribution frame:

Notice — *It is recommended to use a frame with the cooling fan option in all cases, in order to allow all slots to be used without exceeding heat dissipation limits.*

1. Refer to the ***DFR-8300 Series Frames User Manual*** to ensure that the frame is properly installed according to instructions.
2. After selecting the desired frame installation slot, hold the ASI-310 card 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 plugs are properly seated on the midplane and rear modules.

This completes the procedure for installing the ASI-310 in an openGear distribution frame.

Rear Module Labels

Affix a connector label, if supplied, to the rear of the rack frame at the position occupied by the ASI-310, unless it was already attached to the rear module that you installed.

Cable Connections

This section provides information for connecting cables to the installed rear modules on the frame backplane. Connect the input and output cables according to the following diagram. It is not necessary to terminate unused outputs. Note that the BNCs are numbered 1-10 by convention, even though some may not be installed. The upper left BNC is #1, with the other odd-numbered jacks 3-9 below it. The even-numbered BNC jacks 2-10 are in the right column. As shown in the following illustration, the ONG-MDL-R21 module has BNCs 1-4 and 9-10, whereas the ONG-MDL-R25 has BNCs 1-10.

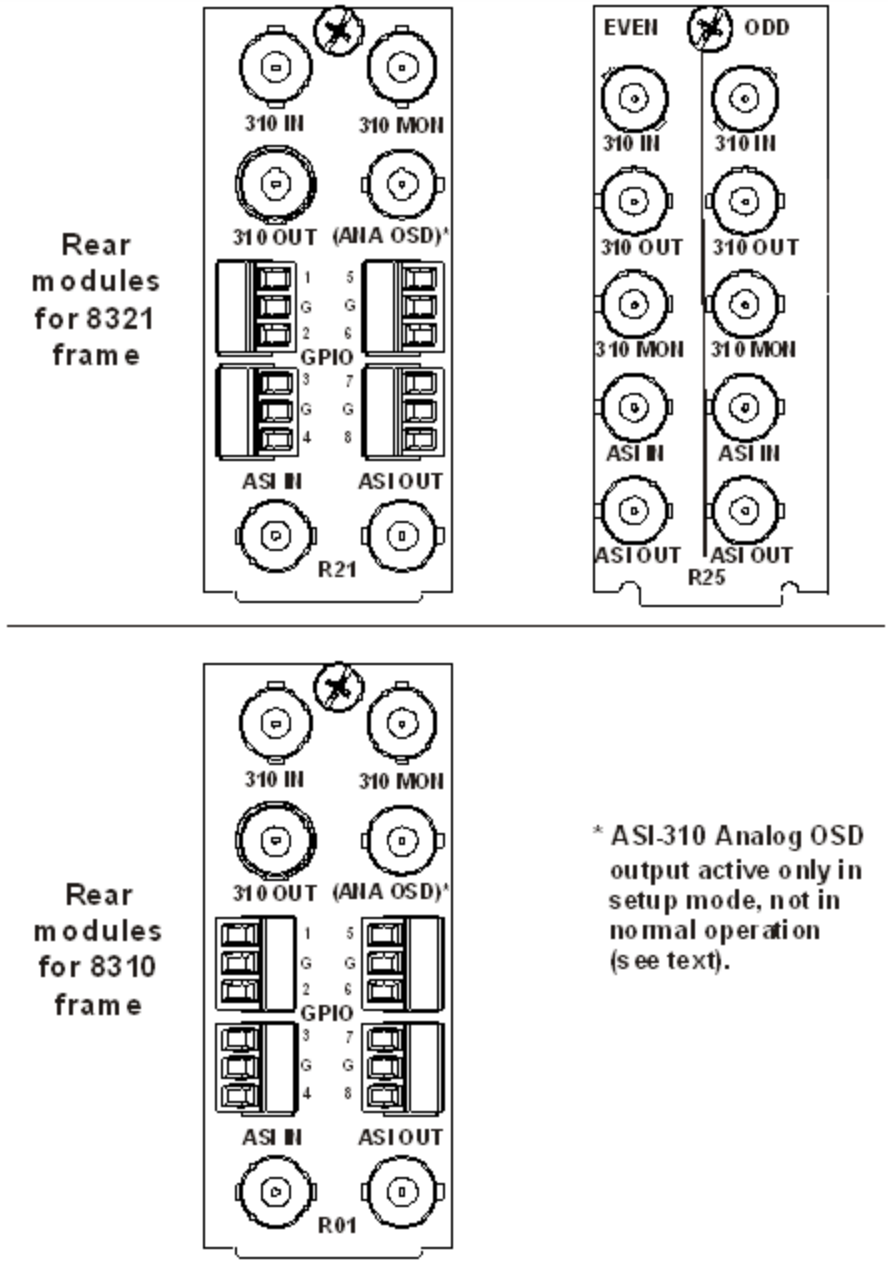


Figure 4. Jack Designations for the ASI-310 for 20-slot frame (top) and 10-slot frame (bottom) rear modules

The R01 and R21 rear modules each connect to one ASI-310 card, and all their jacks are connected to that card. The R25, on the other hand, connects to two cards: there are two groups of five jacks, labeled "ODD" and "EVEN", that connect to the ASI-310 cards in the corresponding odd-numbered and even-numbered slots of the frame (for example, 1 and 2).

ASI Input *(BNC 9 on R01 and R21; BNC 7 or 8 on R25)*

This jack accepts an ASI Transport Stream input for conversion to 310M. The input signal is internally terminated in 75 ohms when the ASI-310 is installed and unterminated otherwise.

310 Output *(BNC 3 on R01 and R21; BNC 3 or 4 on R25)*

This jack carries the SMPTE 310M output produced by conversion of the ASI input. When the ASI-310 card is removed from its slot, the **R01** or **R21** rear module bypasses BNC1 to BNC3 directly.

310 Input *(BNC 1 on R01 and R21; BNC 1 or 2 on R25)*

This jack 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 75 ohms when the ASI-310 is installed. When the ASI-310 card is removed from the **R01** or **R21** rear module, this input is terminated in the equipment connected to the 310 Output jack.

310 Monitor *(BNC 2 on R01 and R21; BNC 5 or 6 on R25)*

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

Analog OSD output *(BNC 4 on R01 and R21; not available on R25)*

When the ASI-310's front card-edge slide switch is in the "Front" position, this jack carries an analog video signal for use in local setup of the ASI-310 card. When the switch is in the "Rear" position, this output is not valid.

ASI/OSD output *(BNC 10 on R01 and R21; BNC 9 or 10 on R25)*

When the ASI-310's front card-edge slide switch is in the "Rear" position, this output is the output of the 310-to-ASI converter. This is the normal operating position. When the switch is in the "Front" position, this jack carries a 259M serial digital (SDI) video signal for use in local setup of the ASI-310 card. The switch is deliberately difficult to move inadvertently, to ensure that an important ASI output is not interrupted by accidentally touching the switch.

GPIO Outputs *(R01 and R21 modules)*

These jacks carry the ASI-310's GPIO outputs that can be used to control external equipment.

User Controls and Indicators

In This Chapter

This chapter contains a description of the ASI-310 user controls:

- Switches
- LEDs

User Controls

Figure 5 shows the front edge of the ASI-310. Following the illustration are descriptions of the controls and indicators identified here.

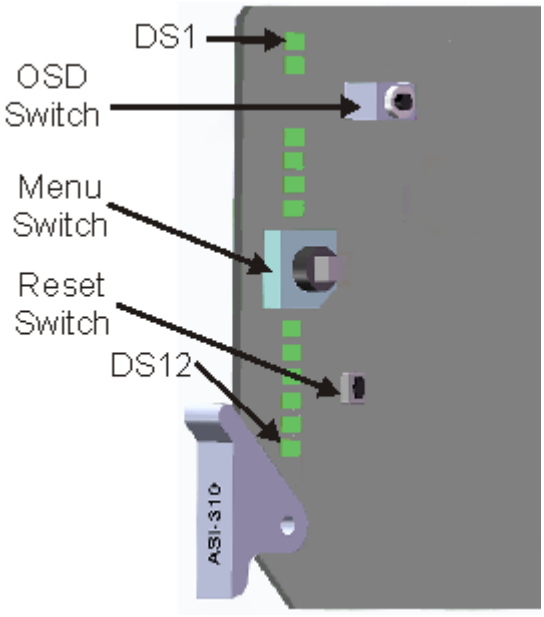


Figure 5: Front card edge controls and indicators

OSD Switch

This slide switch can be used to enable the analog and SDI on-screen displays.

- When the switch is in the "IN" position (closer to the rear of the card), the ASI/OSD output is from the 310-to-ASI converter and the analog OSD is off.
- Moving the switch to the "OUT" position (closer to the front of the card) turns on the OSD on both the analog OSD and ASI/OSD outputs. This should only be done if the ASI output is not in active use.

Menu Switch

The recommended user interface for the ASI-310 is the DashBoard program, running on a computer connected to the openGear frame through an Ethernet connection. If your frame does not have the LAN option, or you do not have access to a computer with DashBoard, you can use the on-screen display (OSD) in conjunction with the **Menu Switch**. This requires an analog picture monitor (NSTC or PAL) to be connected to the card. The **Menu Switch** is a five-direction square finger joystick located near the front edge of the ASI-310 card.

For details on the use of the **Menu Switch** and **OSD**, see the chapter "**Using the On-Screen Menus**".

Reset Switch

This button is used for rebooting the card.

LEDs

The front-edge of the card features LEDs that display the status of the input signals. Descriptions are provided in the following table:

Table 2. Status LED Descriptions

LED	Color	Location	Display and Description
Power	Red/ Green/ Orange	DS1	When off, there is no power. When lit and green the card is running with valid input. When flashing green, the boot loader is waiting for software upload. When lit orange, this is a warning about a signal or configuration error. When lit red, 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.
OSD	Red	DS2	When off, the on-screen display is off. When lit red, the on-screen display is on.
Not used		DS3	
Not used		DS4	
ASI In	Red/ Green	DS5	When lit green, the ASI input is present and valid. When red or flashing red, no valid input is present. This typically means that the input cable is disconnected.
ASI/OSD Out	Red/ Green	DS6	When lit green, the ASI/OSD output serializer has a valid input. When lit red, there is a hardware fault on the card.
Unsupported Rear Module	Red/ Green	DS7	Normally lit green. When lit red, this indicates that the rear module connected to the ASI-310 is not suitable for use with the ASI-310. Operation will not be correct.
Unsupported Video	Red/ Green	DS8	Normally lit green. When lit red, this 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.
OSD	Red/ Green	DS9	Redundant with DS2
ASI In	Red/ Green	DS10	Redundant with DS5
310 In	Red/ Green	DS11	Normally lit green. When lit red, this indicates that there is no 310 input.
ASI Overflow	Red/ Green	DS12	Normally lit green. When lit red, indicates insufficient 310 bandwidth to carry contents of ASI signal.

DashBoard and Status Monitoring

In This Chapter

This chapter provides an explanation of the functions available when using DashBoard to monitor the ASI-310. The DashBoard software and manual are available for download at the Ross Video website.

The following topics are discussed in this chapter:

- Selecting an ASI-310 Module
- Screen layout
- How to use the Status screens.

This section focuses on the use of the DashBoard program to control and monitor an ASI-310. For a more complete description of DashBoard and its capabilities, refer to the ***DashBoard Control System User Manual***.

Note — *The screen shots in this and the next chapter apply when an ONG-MDL-R01or R21 rear module is used. When other rear module types are used, the GPIO capabilities may not be available. Consequently, the GPIO and GPIO Status tabs are not displayed..*

Selecting an ASI-310 Module

Figure 6 shows a typical DashBoard screen. After it has established its connection to the frame containing the ASI-310, a list of modules is displayed at the left side. Clicking on a frame and then double-clicking on an ASI-310 causes a window for that module to be opened, resulting in the display shown here. In this simple example, there is only one device, the ASI-310, open. DashBoard provides the ability to view multiple devices in this window. For details, see the ***DashBoard Control System User Manual***.

Screen layout

The ASI-310 window is divided into four sections as shown:

- The upper left side is the Product Status area, and displays a summary of the present module status.
- The lower left side is the Status area and provides various tabs to select more detailed status.
- The right side, the Settings area, provides controls to allow control of the various functions of the module.
- The bottom band contains buttons for functions that are used relatively infrequently.

Product

The left side of this figure shows product information that is useful in discussing the operation of the module with Ross Video's Technical Support staff.

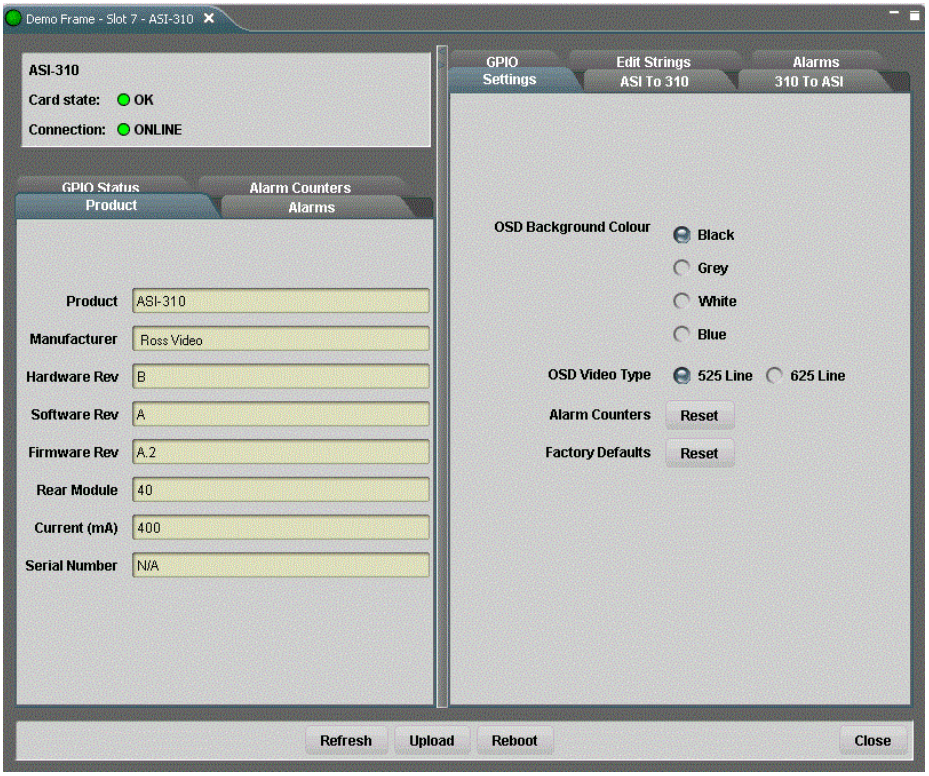


Figure 6: ASI-310 DashBoard Screen, showing Product Status and Settings

GPIO Status

The left side of Figure 7 shows the main status screen for the ASI-310.

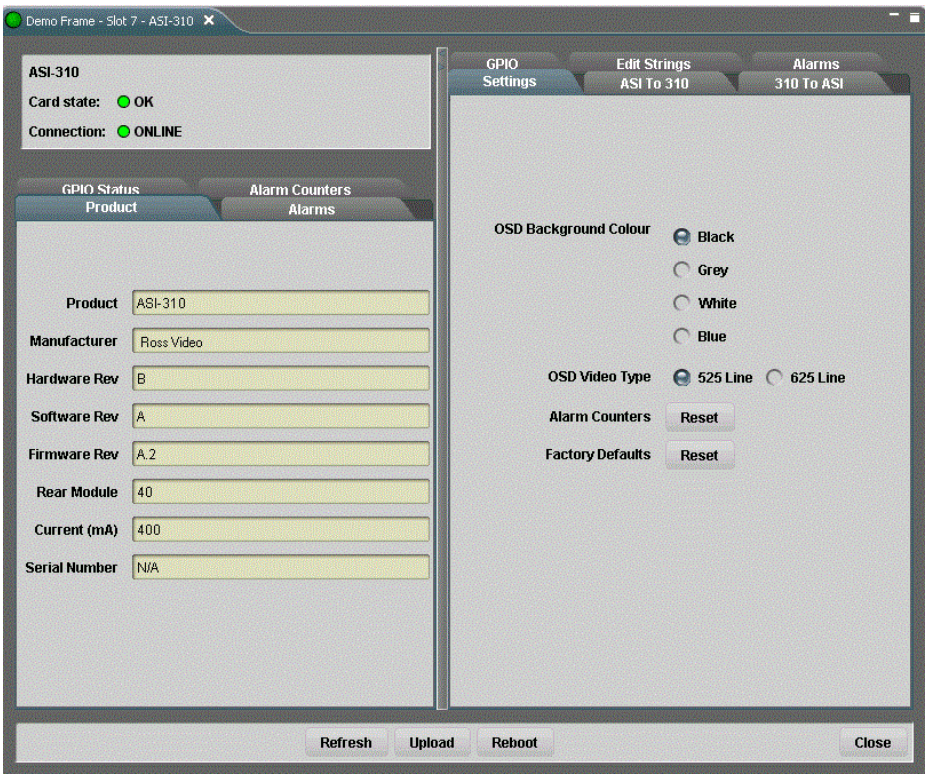


Figure 7. GPIO Status screen

Card Status is a summary of the status of the card. If the indicator is green, the text is "OK" and the card is operating as expected. If this is red, there is either an error condition such as missing input or an overflow due to an input-output rate mismatch, or the OSD is enabled.

Incoming ASI and Incoming SMPTE 310 display the presence, packet size (188 bytes) and data rate (19.393 Mbps) of the ASI input and 310 output.

Outgoing 310 Null Rate is 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.

GPIO 1-8 indicate the state of the 8 GPIO outputs. A later section describes how to assign error conditions to the GPIO outputs. The normal non-error state of these GPIOs is typically "low"; in this case, any that display "high" indicate a currently existing error condition that you need to investigate.

Alarms

The left side of Figure 8 shows the Alarms status screen. This displays the ASI and 310 data rates and 310 null rate, which are the same as those on the GPIO Status screen. It also displays the state of each of the monitored conditions.

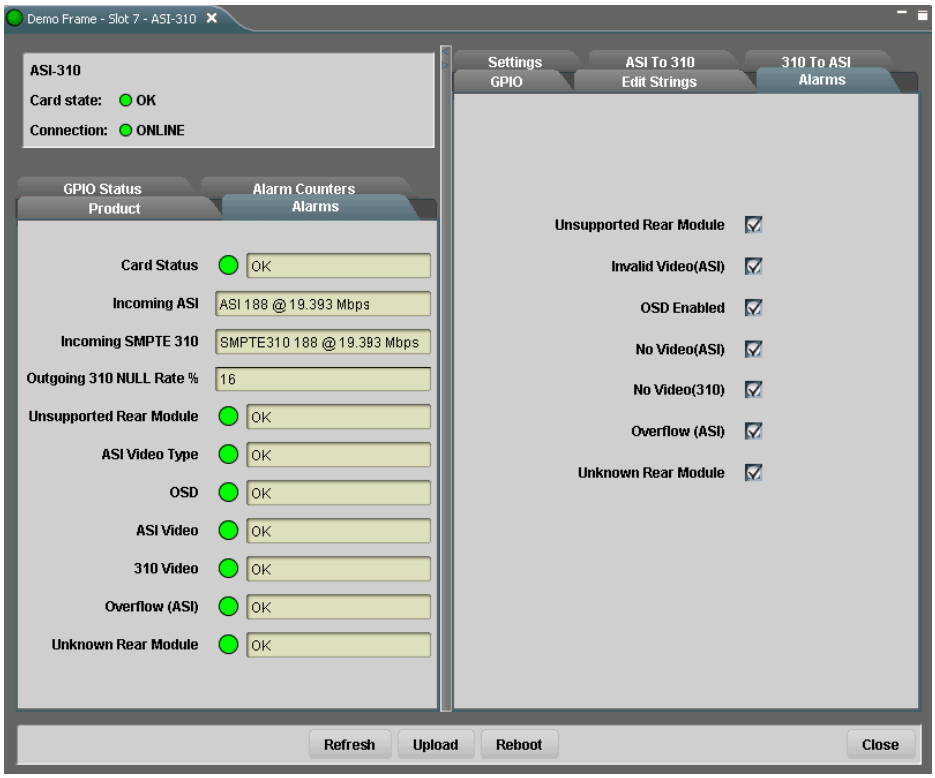


Figure 8. Alarms status screen

The alarm conditions listed in the Alarms status screen are qualified by the selections made on the Alarms setup screen. Any error conditions that are checked on the Alarms setup screen will cause the Card Status to turn red when they occur. Alarm conditions that are unchecked will be ignored in compiling the Card Status.

Unsupported Rear Module means that 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.

Invalid Video (ASI) means that the ASI input is connected but is not recognized as ASI.

OSD Enabled indicates that the ASI/OSD output has been switched to OSD mode, which is a serious error if you are using the ASI signal in downstream equipment. If you are not using the ASI output, this is not an error condition and you can disable this alarm.

No Video (ASI) means that the ASI input signal is not connected.

No Video (310) means that the 310 input signal is not connected or its data rate is incorrect.

Overflow (ASI) means 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 means that the ASI-310 does not recognize this rear module and thus may not work properly.

Alarm Counters

The left side of Figure 9 shows the Alarm Counters screen. This displays the ASI and 310 data rates and 310 null rate, which are the same as those on the GPIO Status screen. It also displays, for each GPIO 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 GPIOs are associated with error conditions, this screen 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 on the **Settings** menu.

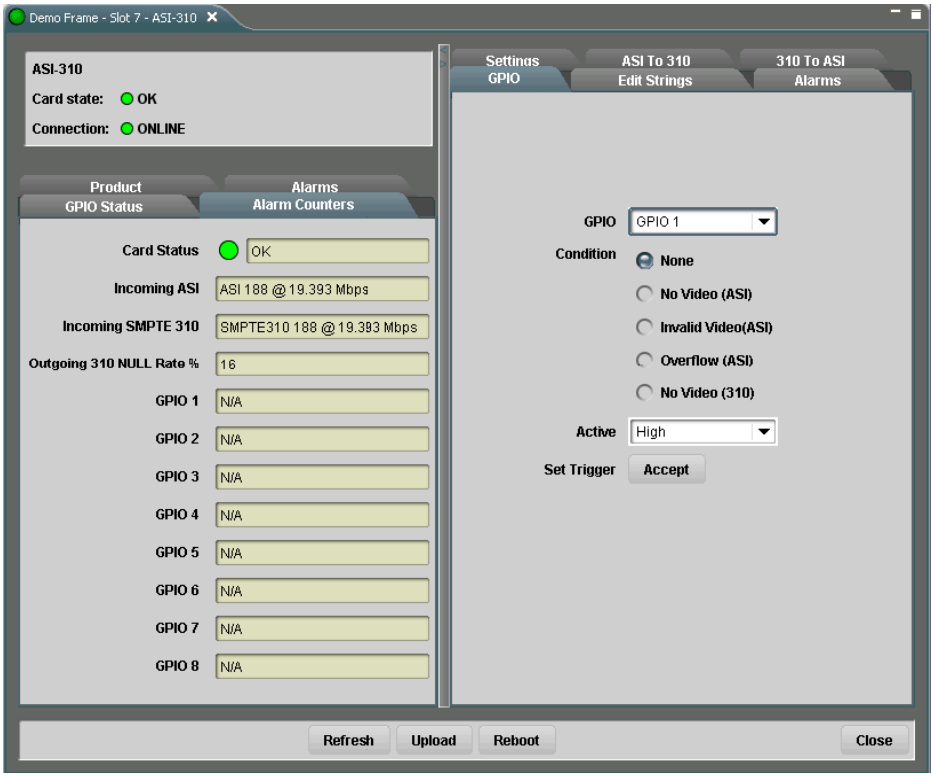


Figure 9. Alarm Counters status screen

Setting Up the ASI-310

In This Chapter

This chapter explains how to use the graphical user interface to set up the ASI-310, using DashBoard through a network connection.

The following topics are discussed:

- General, ASI-to-310 and 310-to-ASI Settings
- Assigning GPIO outputs
- Naming the card and GPIO outputs
- Setting Alarm sensitivity

General Settings

Figure 10 shows the screen that is displayed by clicking the **Settings** tab. This provides general settings for the on-screen display and two reset buttons.

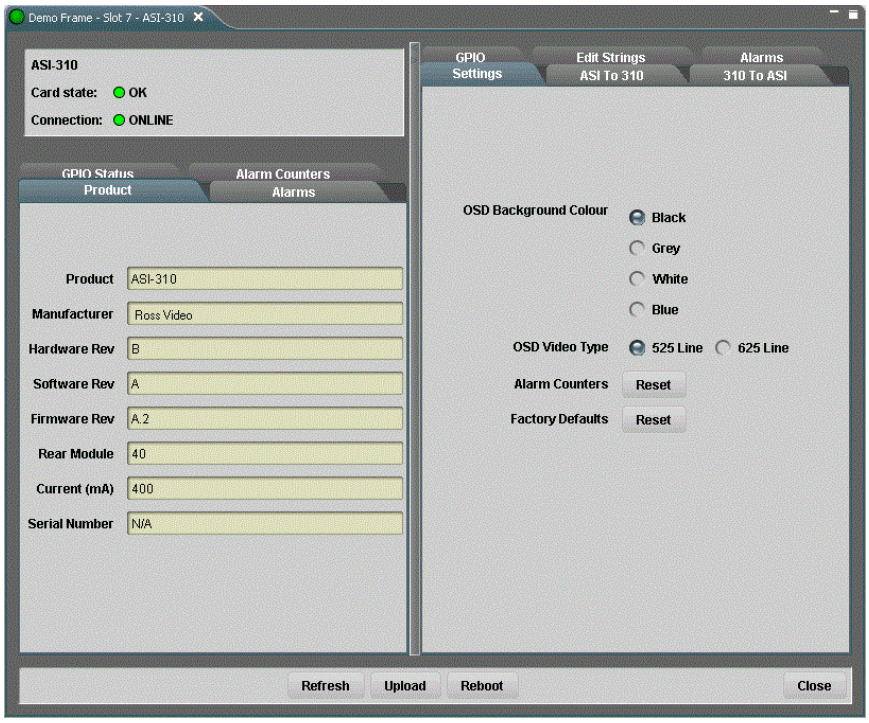


Figure 10. Settings menu

OSD Background Color and ***OSD Video Type*** (525 or 625 lines) should be set to the desired values if you plan to use the On-Screen Display for setup. The OSD is available in both analog and SDI formats on BNC jacks. This interface is discussed in a later chapter.

ASI to 310 Settings

Figure 11 shows the ASI to 310 settings menu, used to setup the ASI-310 converter.

Figure 11: ASI-to-310 Settings

310 Output Bit Rate sets the output data rate to either **19.39** or **38.78** Mbit/sec.
Output Packet Size lets you adjust 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.
PCR Restamping can be set to **On** or **Off**. 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.
310 Output Clock can be set 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.
310 Input Bit Rate sets the 310 reference input data rate to either **19.39** or **38.78** Mbit/sec. 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.

Warning — *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 Settings

Figure 12 shows the 310 to ASI settings menu, used to setup the 310-ASI converter.

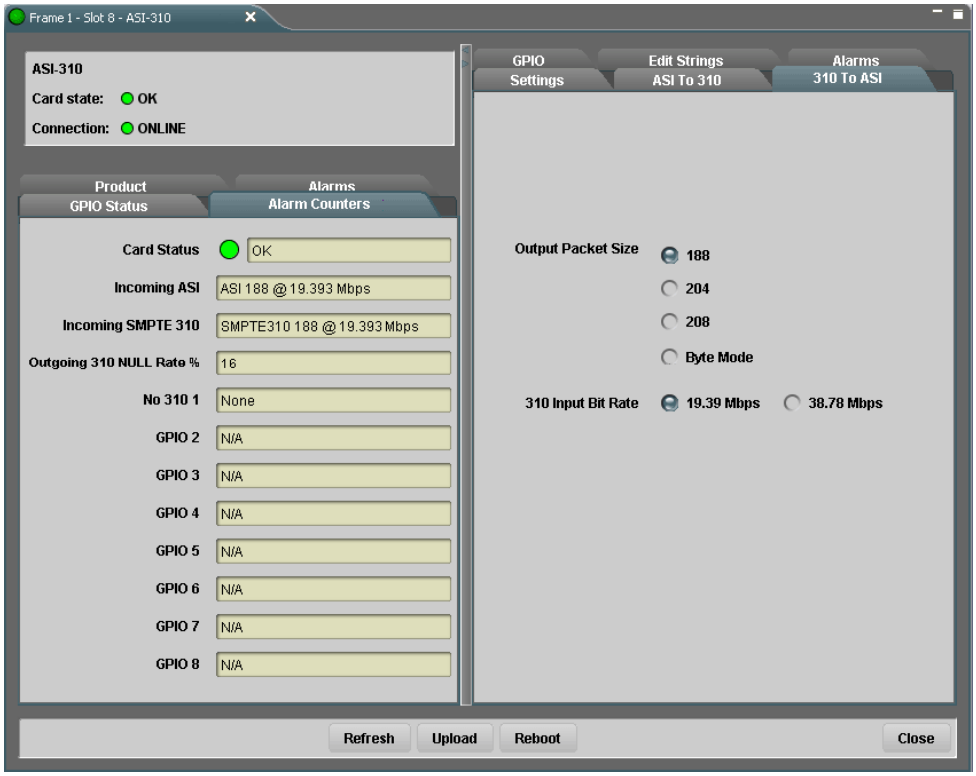


Figure 12: 310-to-ASI Settings

Output Packet Size lets you adjust the number of bytes per packet in the ASI 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. In all three cases, all the bytes of each TS packet are output consecutively, and fill characters (K28.5) are inserted between packets. This is known as ***Packet Mode***.

The fourth selection for ***Output Packet Size*** is ***Byte Mode***. In this mode, each SMPTE 310 byte that arrives at the converter input is transmitted on the ASI output as soon as it is ready.

When there are no bytes ready for transmission, K28.5 characters are transmitted. In Byte Mode, 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 **38.78** Mbit/sec. 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 menu, since this input can also be used as a frequency reference for the 310 output.

GPIO Settings

Figure 13 shows the GPIO settings menu. This allows you to assign GPIO outputs to error conditions.

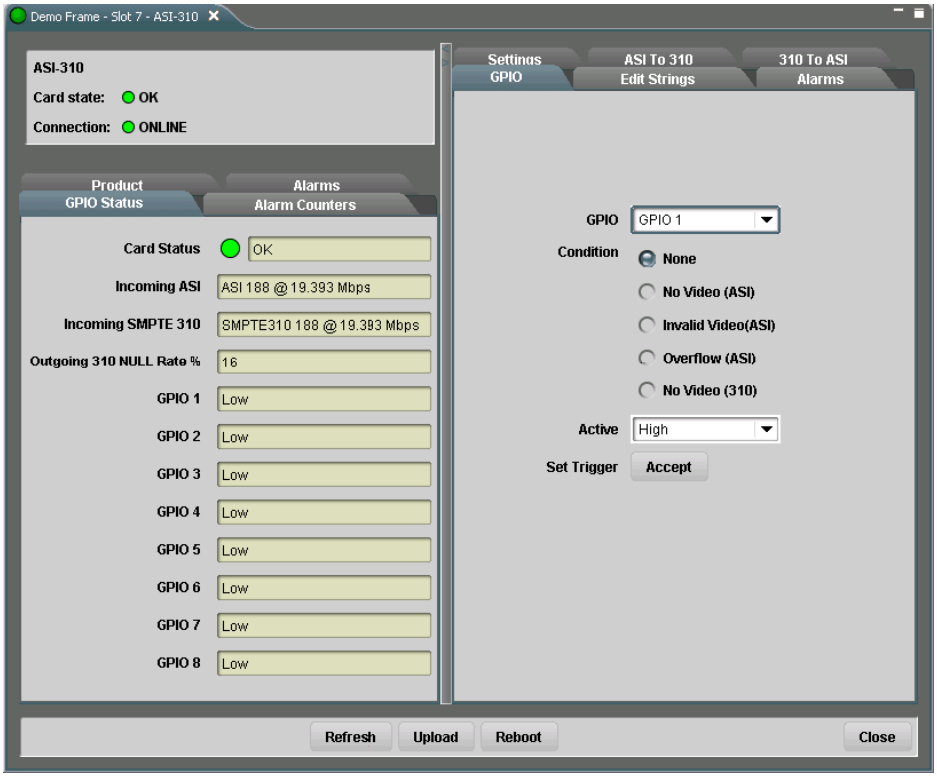


Figure 13. GPIO menu

First select the **GPIO** that you want to assign from the selector labeled GPIO. The eight selections are named

GPIO 1 through GPIO 8. If you have renamed the GPIOs (discussed in the next section on String Settings), the names you have assigned will appear in this list instead.

Once you select a GPIO, use the radio buttons to select the **condition** that you want to trigger it

Active level is the logic level that is present on the GPIO 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.

Once you have made the selections for GPIO 1, click **Accept** then **Yes** to save them before moving on to other settings.

String Settings

Figure 14 shows the **Edit Strings** menu. This 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 GPIO outputs.
In this example, the **card ID** has been changed to " - Main ". 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".

If desired, you can also assign each of the **GPIO** outputs a descriptive name such as "No ASI In". This name is used in the GPIO Status and Alarm Counters status screens the default name.

After changing any of the Strings, click the **Apply** button and then answer **Yes** in the confirmation dialog box, to save them.

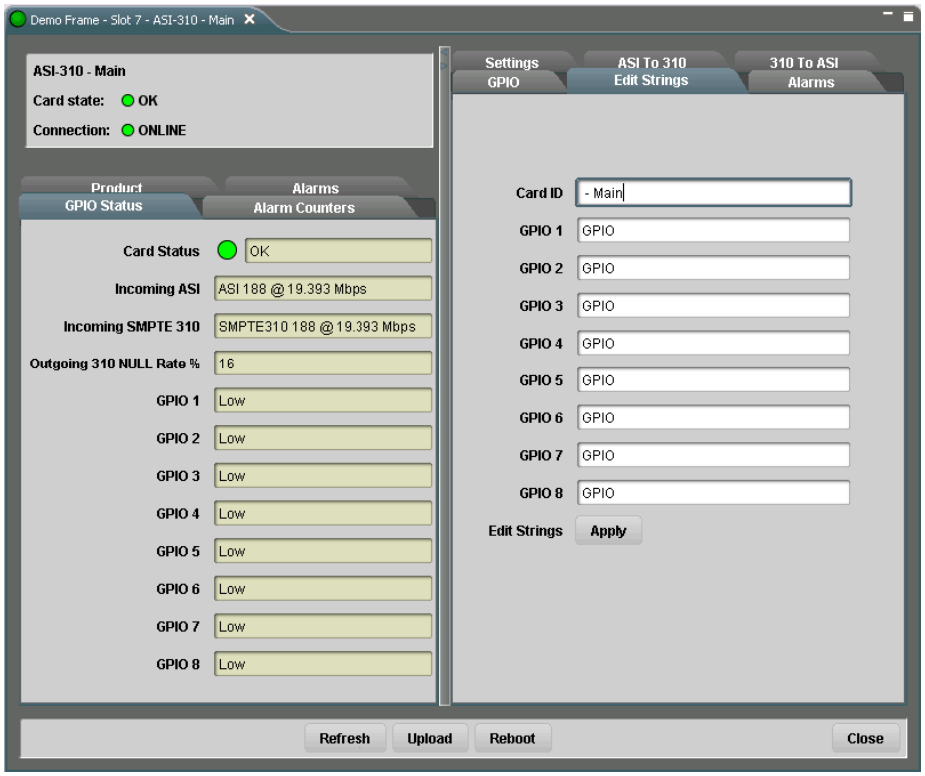


Figure 14: Edit Strings menu

Alarm Settings

Figure 15 shows the **Alarms** settings menu. This allows you to specify the conditions that are included in the Card Status and reported though SNMP if enabled on the frame.

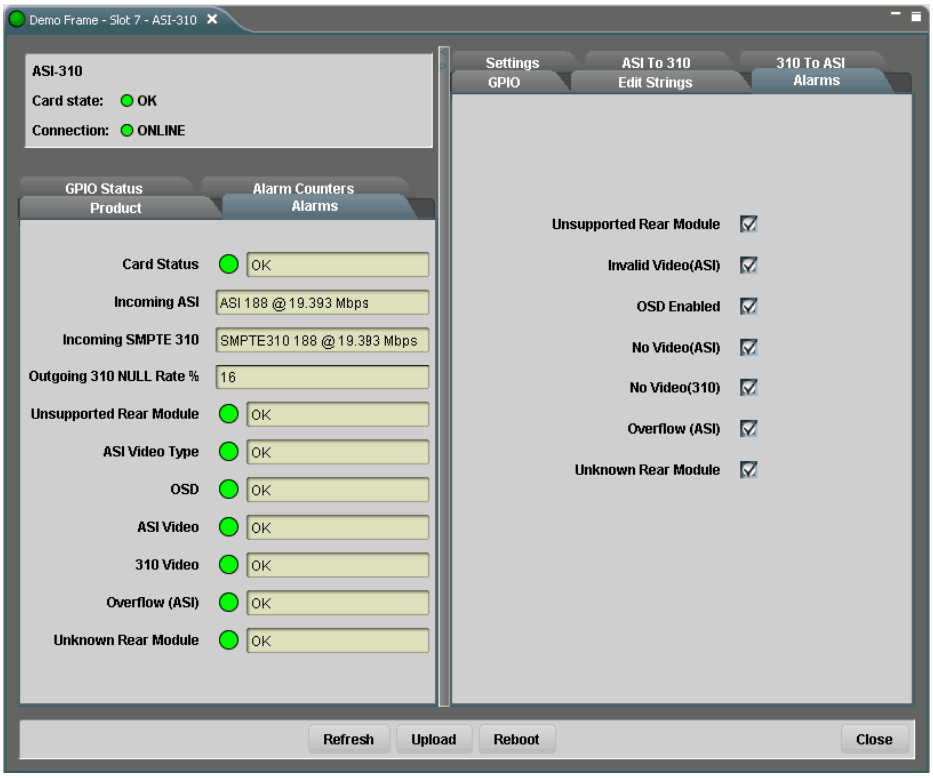


Figure 15: Alarm Settings

Unsupported Rear Module means that 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.

Invalid Video (ASI) means that the ASI input is connected but is not recognized as ASI.

OSD Enabled indicates that the ASI/OSD output has been switched to OSD mode, which is a serious error if you are using the ASI signal in downstream equipment. If you are not using the ASI output, this is not an error condition and you can disable this alarm.

No Video (ASI) means that the ASI input signal is not connected.

No Video (310) means that the 310 input signal is not connected or its data rate is incorrect.

Overflow (ASI) means 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 means that the ASI-310 does not recognize this rear module and thus may not work properly. This and **Unsupported Rear Module** should only occur when a card is first plugged in i.e. before it is put into service.

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 disable the Alarm for **No Video (310)**, so that the absence of this input does not cause the card status indicator to be red. Similarly, if you do not use the ASI-to-310 converter, you should disable the Alarms for **Invalid Video(ASI)**, **No Video (ASI)** and **Overflow (ASI)**.

Using the On-screen Menus

In This Chapter

This chapter explains how to use the Menu functions available on the Heads-Up Display of the ASI-310. It does not describe each available menu; for information on these, see the chapters that describe the menus available through DashBoard. The purpose is to explain how to navigate the menus and access the available functions and settings.

The following topics are discussed:

- Layout and Navigation
- Using the Menus

Layout and Navigation

The **Menu Switch** is a five-direction square finger joystick located near the front edge of the ASI-310 card. With the card edge facing you, use the following menu switch actions to navigate the menu and configure parameters:

- **In** —Press once to enter a value or select a menu or item.
- **Up** — Press once to move to the menu, item, or value above the current selection.
- **Down** — Press once to move to the menu, item, or value below the current selection.
- **Forward** — Press once to move across columns from left to right. While editing an alphanumeric value, press once to move to the next character to the right.
- **Back** — Press once to move across columns from right to left. While editing an alphanumeric value, press once to move to the previous character to the left.

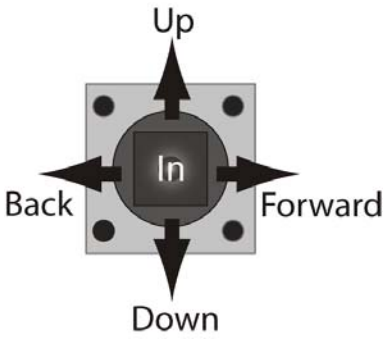


Figure 16. Menu Switch

When the ASI-310's front OSD slide switch is in the normal "in" position, the OSD is off and its output jack is the output from the 310-to-ASI converter. To use the OSD, move it to the "out" position (closer to the front edge of the card). The menu shown below is displayed on the OSD output. The top line of the screen has three items:

- The leftmost item, **Product**, is the first in a list of Status screens. To view these screens, press the Menu Switch ***In*** to highlight the word **Product**, then press the Menu Switch ***Down*** once to view the **GPIO Status** screen, and ***Down*** again for the next screen in the sequence. These are the same Status screens described in the DashBoard Status chapter.
- The second item, **Settings**, is the first in a list of Setup menus. To view these, press the Menu Switch ***Forward*** to advance the selection bar to the word **Settings**, then press the Menu Switch ***In*** to highlight it. Now press the Menu Switch ***Down*** once to view the **ASI to 310** menu, and ***Down*** again for the next menu in the sequence. These are the same Setup menus described in the DashBoard Setup chapter.
- The third item is **Exit**. To turn off the OSD, press the Menu Switch ***Forward*** to advance the selection bar to the word **Exit**, then press the Menu Switch ***In***. To turn the OSD back on, press the Menu Switch ***In*** again. This selection is somewhat redundant, since you should return the front OSD switch to the "in" position anyway to turn the OSD off.

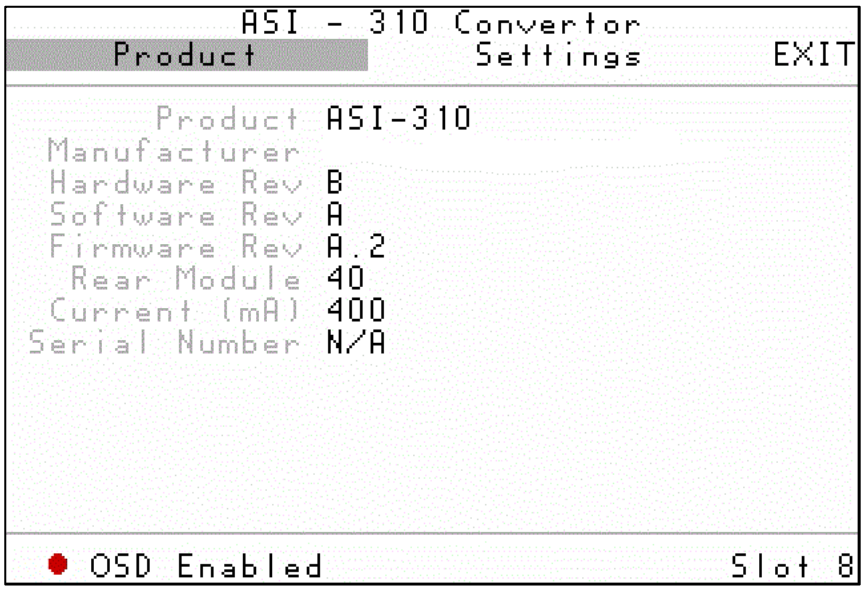


Figure 17. Main OSD screen, showing Product Status

Using the Menus

The available screens that can be selected are:

Status (left column)	Setup menus (center column)	Exit (right)
Product	Settings	Exit
GPIO Status	ASI to 310	
Alarms	310 to ASI	
Alarm Counters	GPIO	
	Edit Strings	
	Alarms	

The use of the menus to change settings will be illustrated by the following example:

1. Navigate to the Setup Menus entry on the top row, as discussed previously, by using the ***Forward*** and ***Back*** positions of the Menu Switch.
2. If the Menu name (for example, **Settings**) is highlighted (brighter than other text), skip to step 3. If it is not highlighted, press the Menu Switch ***In*** to highlight it.
3. Press the Menu Switch ***Down*** or ***Up*** to step through the available menus.
4. When you reach **Settings**, select it by pressing the Menu Switch ***In***. The display should be similar to the one shown in Fig. 15.
5. Now press the Menu Switch ***Down*** or ***Up*** to step through the available items that you can set on this menu.

6. When you reach the **OSD Color** item, select it by pressing the Menu Switch ***In***.
7. Now press the Menu Switch ***Down*** or ***Up*** to step through the available values for this item. You will note that the background color changes at each step.
8. When you reach the desired value (desired background color in this example), select it by pressing the Menu Switch ***In***.
9. Repeat steps 5-8 to select values for the other settings that you want to change.
10. To switch to a different menu, press the **Menu Switch *Up*** or ***Down*** repeatedly until the selection bar moves to the title. Press the **Menu Switch *In*** and return to step 3.

Note — *While editing numeric fields, Forward and Back allow you to select individual digits, while Up and Down change the value of the selected digit. Numeric entry is completed by pressing the Menu Switch In. This also applies to editing alphanumeric values in the Edit Strings menu.*

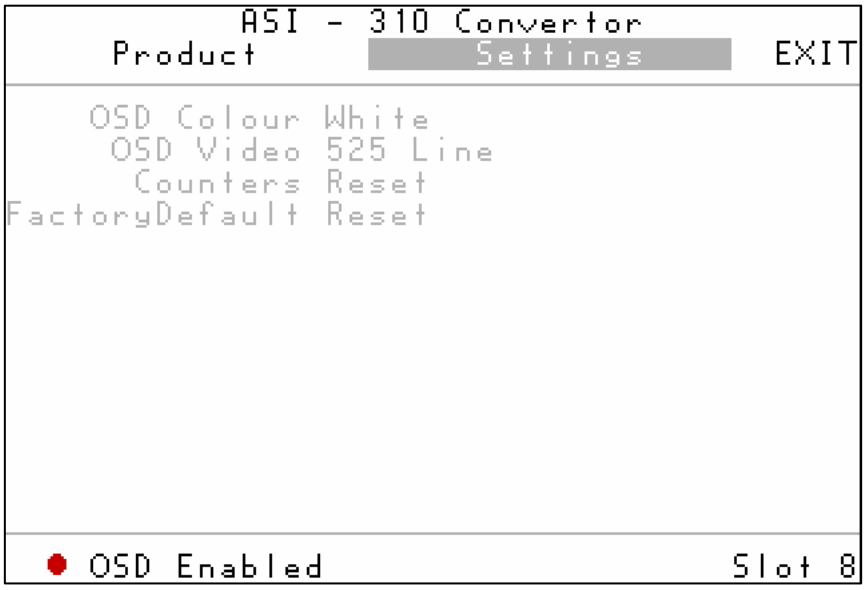


Figure 18.OSD Settings menu

Specifications

In This Chapter

This chapter contains the Technical Specifications table. Specifications are subject to change without notice.

Table 3 ASI-310- Technical Specifications

Category	Parameter	Specification
Serial Digital Video Inputs	Number Of Inputs	2 inputs
	Input Signal Standards Accommodated	1 x DVB-ASI (EN 50083-9) 1 x SMPTE 310M
	Impedance	75Ω terminating
	Equalization	Over 150 m (500 ft.) of Belden 1694A cable
	Return Loss	>15 dB to 270 MHz
Serial Digital Video Outputs	Number of Outputs	2 x SMPTE 310M 1 x DVB-ASI (dual-purpose with 259M OSD)
	Impedance	75Ω
	Return Loss	>10 dB to 270 MHz
	Signal Level	800mV ±10%
	DC Offset	0 Volts ±50 mV
	Rise & Fall Time (20-80%)	750 ps. typical
	Overshoot	< 8%
	Jitter	< 500 ps.
	SMPTE 310 free running bit rate	19,392,658 or 38,785,317 bits/sec ±2.8 ppm
On-Screen Display (OSD)	Outputs	1 Analog video 1 SMPTE 259 SDI (ASI Out in normal operation)
GPIO Outputs	Number and type of outputs	With ONG-MDL-R01 or R21 rear module: 8 logic outputs (3.3v) and 4 ground connections, on 4 three-pin connectors.
Other	Maximum Power Consumption	5W
	Warranty	1 year return to factory

Service Information

In This Chapter

This chapter contains the following sections:

- Troubleshooting Checklist
- Power LED Conditions
- Bootload Sequence
- Warranty and Repair Policy

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 module still does not appear to be working properly after checking all possible causes, please contact your openGear products distributor, or the openGear Technical Support department at the numbers listed under the "Contact Us" section at the end of this manual.

1. **Visual Review –** Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the module, 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. **Reseat the Card in the Frame** – Eject the card and reinsert it in the frame.
4. **Check Control Settings –** Refer to the Installation and Operation sections of the manual and 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. **Module Exchange** – Exchanging a suspect module with a module that is known to be working correctly is an efficient method for localizing problems to individual modules.

Power LED Conditions

The top front edge of the module has a Power LED which indicates card status. The Power LED displays the following conditions:

- **Off** - there is no power.
- **Green** - the card is running with valid input.
- **Flashing green** - the boot loader is waiting for, or receiving, a software upload.
- **Orang**e – there is a signal or configuration error. Check the inputs and menus.
- **Red** – the OSD is enabled or the card is not operational; for example, there may be no video input. Check the inputs, reseat the card, press the Reset button, or call Technical Support.

Bootload Sequence

In the unlikely event of a complete card failure, you may be instructed by a Ross Video Technical Support specialist to perform a complete software reload on the ASI-310. To perform this task, follow these steps:

1. Press and hold the Menu Switch in.
2. While holding the Menu Switch, press the Reset button in.
3. Release the Reset button and then the Menu Switch.

   The Power LED will flash GREEN while the card is waiting for a new software load. If a new software load is not received within 60 seconds, the card will attempt to restart with the last operational software load.

Software loads can be sent to the ASI-310 from DashBoard, using the Frame Controller with Networking.

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 User Manual provides all pertinent information for the safe installation and operation of your ASI-310. 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 module 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.

Contact Us

Contact our friendly and professional support representatives for the following:

- Name and address of your local dealer
- Product information and pricing
- Technical support
- Upcoming trade show information

PHONE	**General Business Office and Technical Support**	613 • 652 • 4886
	After-hours Emergency	613 • 349 • 0006
	Fax	613 • 652 • 4425
E-MAIL	**General Information**	solutions@rossvideo.com
	Technical Support	techsupport@rossvideo.com
POSTAL SERVICE	**Ross Video Ltd.**	8 John Street, Iroquois, Ontario, Canada K0E 1K0
	Ross Video Incorporated	P.O. Box 880, Ogdensburg, New York, USA 13669-0880

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Ross Product Number: ASI310DR-004-02