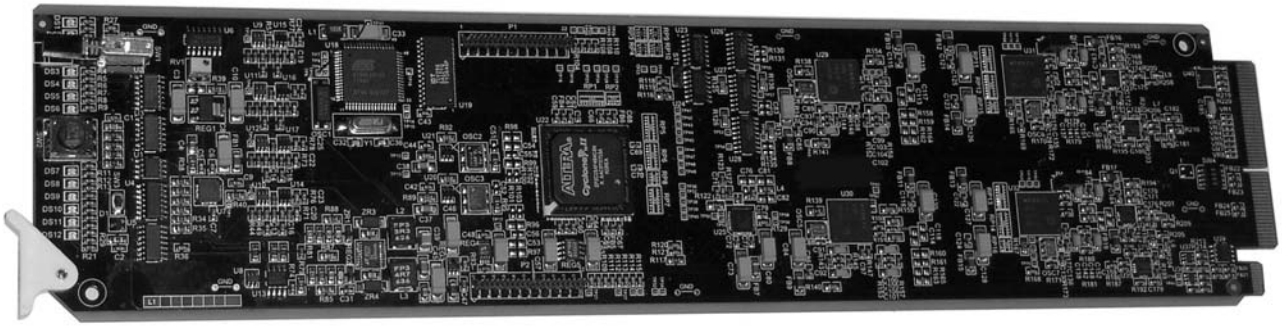
Ross Video Limited

GPI-100

VANC to GPIO Trigger Inserter/Decoder

User Manual



Live Production Technology

openGear

Product Name: GPI-100

GPI-100 • VANC to GPIO Trigger Inserter/Decoder User Manual

- Ross Part Number: **GPI100DR-004-02**
- Release Date: September 21, 2010. Printed in Canada.

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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 Limited could void the user's authority to operate this equipment.

CANADA

This Class "A" digital apparatus complies with Canadian ICES-003.

Cet appareil numerique 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.

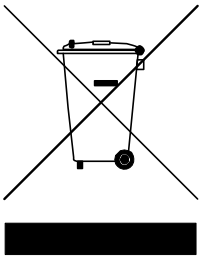
Environmental Information

The GPI-100 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
- Functional Block Diagram
- Features
- Documentation Terms

A Word of Thanks

Congratulations on choosing the openGear GPI-100 VANC to GPIO Trigger Inserter/Decoder. The GPI-100 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 GPI-100 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 GPI-100, 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 GPI-100 enables GPIO triggers to be carried in the Vertical Ancillary (VANC) data area of an SDI (SMPTE 259) or HD-SDI (SMPTE 292) video signal, in accordance with SMPTE 291 and other related standards. The GPI-100, as an encoder, reads GPIO inputs and inserts them into the VANC. As a decoder, it reads the VANC and applies the data to GPIO outputs. This allows GPIO enabled equipment to be triggered remotely through the video path.

The GPI-100 provides a simple interface allowing the carriage of GPIO triggers as part of the video signal. For example:

- The card is set to act as an encoder or a decoder. This determines if the card will read and place the GPIOs into the VANC (encode) or read the VANC and assert the GPIOs (decode).
- GPIO triggers are logged both to the screen and to a log file. The log file can be transferred from the card to a PC through a network connection.
- Entries in the log file are time stamped. The GPI-100 can be set to use an NTP time server, time code or its own internal clock as its time reference.
- One GPI-100 can insert trigger for many GPI-100s acting as receivers. There are eight GPIOs available and a receiver can act on all or some of them.
- As a member of the openGear family, the GPI-100 shares a common control interface, known as DashBoard, with a broad array of other products.
- Card configuration can be uploaded to a PC. This configuration can be used to reconfigure a card back to a known state or to quickly clone the card setup into other cards.

To make configuration truly easy, the GPI-100 offers a complete user interface through the DashBoard control program. It also provides a Heads-Up Display on separate monitoring outputs; both analog video and SDI are available. 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 GPI-100 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 the GPI-100 the best solution for carrying GPIO triggers with the video:

- Operates automatically with major SD and HD video formats.
- Each card can be setup to either encode or decode.
- Frame-accurate triggering: each trigger is delivered within one video frame time.
- All triggers are logged as a proof of delivery.
- Allows you to select a unique Originator ID so another operator's triggers will not affect your GPIO outputs.
- Video bypass capability with ONG-MDL-R01, R21 or R23 rear module.
- Fits openGear DFR-8300 series frames.
- Compatible with the openGear frame's SNMP option, allowing monitoring with third-party SNMP software systems. For more information, contact Ross Technical Support.

Functional Block Diagram

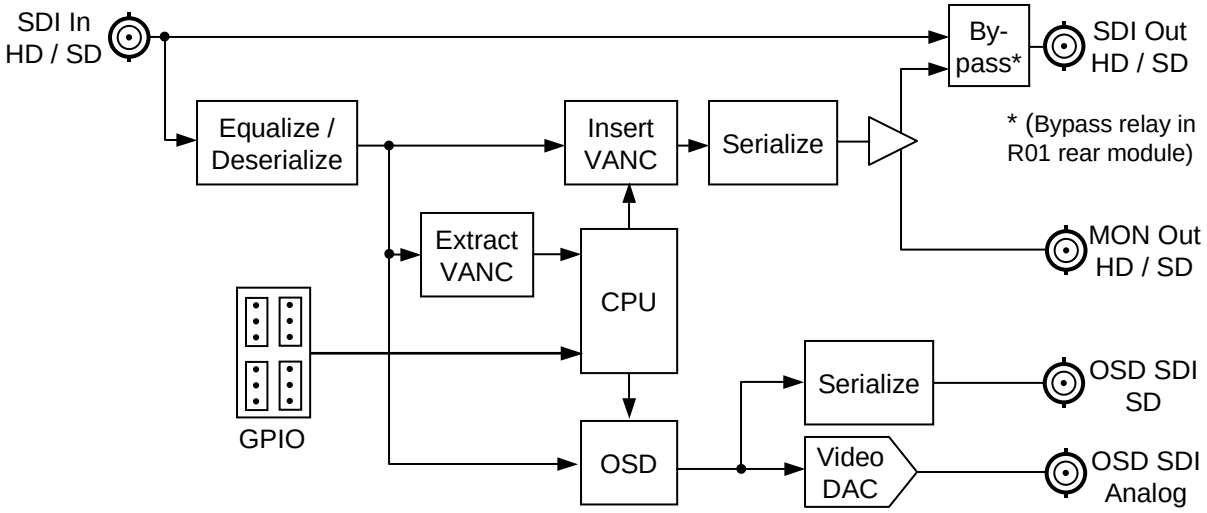


Figure 1. Simplified Block Diagram of GPI-100 Functions

Documentation Terms

The following terms are used throughout this guide:

- "**Frame**" refers to the frame that houses the **GPI-100** card.
- "**Operator**" and "**User**" refer to the person who uses the **GPI-100**.
- "**Board**" and "**Card**" refer to the **GPI-100** card itself, including all components and switches.
- "**System**" and "**Video system**" refer to the mix of interconnected production and terminal equipment in which the **GPI-100** operates.
- "**Rear Module**" refers to the connector module at the rear of the frame, into which the **GPI-100** 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.
- "**VANC**" is the Vertical Ancillary data space of a serial digital video signal, and is defined by SMPTE standard 291M.

Frame and Rear Module Compatibility

The GPI-100 can operate with the following frame and rear modules combinations. It should be noted that rear module choice dictates the functionality of the GPI-100.

Table 1.Combinations of GPI-100, Frame and Rear Module models

Rear Module	Frame	Bi-Directional GPIOs	Isolated GPIO	Program 2 Out	Bypass Relay
ONG-MDL-R01	DFR-8310-N	Yes	No	Yes	Y
ONG-MDL-R02*	DFR-8310-N	No	Yes	No	N
ONG-MDL-R21	DFR-8321-C or –CN or -CNS	Yes	No	Yes	Y
ONG-MDL-R22*	DFR-8321-C or –CN or -CNS	No	Yes	No	N
ONG-MDL-R23	DFR-8321-C or –CN or -CNS	Yes	No	Yes	Y

* R02 and R22 will function in decode mode.

Quick Start

Assuming you have a openGear frame, an **ONG-GPI-100** card and a suitable rear module, the following steps will get you started with VANC metadata insertion:

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 are available from the Ross Video website.
3. Install two rear modules in the frame, as described in the section "**Rear Module Installation**" of this manual.
4. Install two GPI-100s into the rear modules, as described in the section "**Board Installation**" of this manual. One will be used to insert the GPIO triggers into the VANC and the other will be used to read the GPIOs from the VANC.
5. Connect a 292 or 259 signal to the SDI input jack on the rear module of the encode card as described in the section "**Cable Connections**" of this manual.
6. Connect the SDI output jack of the encode card to the SDI input jack of the decode card.
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 GPI-100 to be used to encode.
8. Click the **Settings** tab and set the **Card Function** to **Encode**. It is also a good idea to give the card a meaningful name. This makes it easier to identify it in a frame which contains many cards. Click the **Save Settings Accept** button to make these changes.
9. Click the **GPIO Mask** tab and check the boxes for all eight GPIOs. It will not matter if you do not connect a GPIO to every connection because the connection will be open by default. Click on the **GPIO Mask Save** button to make this change.
10. Connect a GPIO source (for example, a switch) to one or more of the GPIO inputs of the card as described in the GPIO inputs section of this manual.
11. Under the frame, click on the other GPI-100 card which will be used to decode the triggers. On the **Settings** tab set the **Card Function** to **Decode** and give the card a name. Click the **Save Settings Accept** button to make these changes.
12. Click the **GPIO Mask** tab and check the boxes for all eight GPIOs. Click on the **GPIO Mask Save** button to make this change.
13. Connect one or more of the GPIO outputs of the card to a GPIO controlled device. Your GPIO source is now driving your GPIO controlled device through the VANC.
14. You must set the time for the log's time stamp to be accurate. Click on the **Time** tab and set the time according to the instructions in the section "**Setting the Logging Timestamp**" of this manual. Set a **Time Source** (Timecode is recommended if it is available in the VANC). Set the other parameters if required for the Time Source. Click **Accept** to save your changes.
15. Click on the **Log** tab of the decode card. Each time your GPIO source sends a trigger it appears in the log. This tab shows the last 20 entries of the log file maintained on the GPI-100. The complete log can be downloaded to the PC by pressing the **Download Logfile Save** button.

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 GPI-100 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 GPI-100 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 Limited directly.

Rear Module Installation

The GPI-100 for both encoding and decoding require Ross Video Rear I/O Module with GPIO jacks. You will need to install the I/O module in your openGear frame before you can install the GPI-100 in the frame, or connect cables to the slot you have chosen for the GPI-100.

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 GPI-100 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.

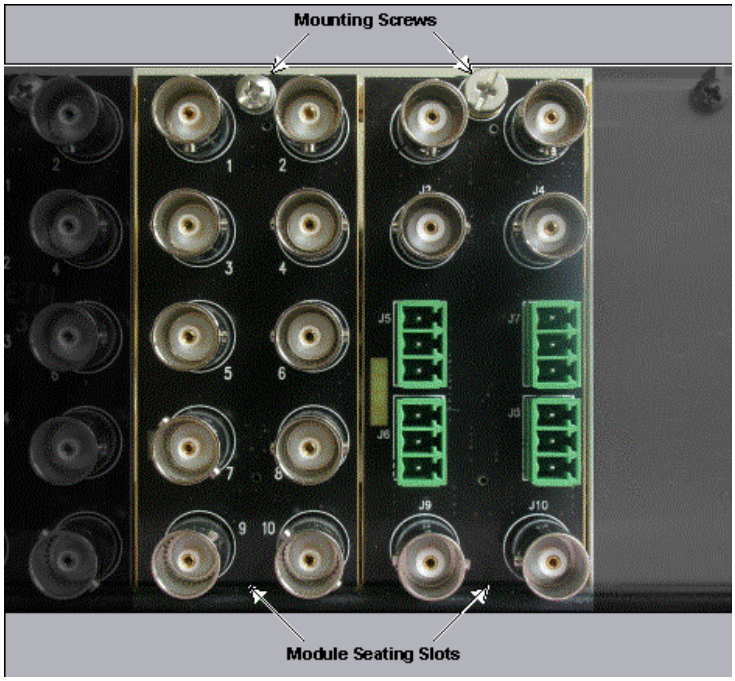


Figure 2. Rear Module Installation, showing RM-8300-B (left) and ONG-MDL-R01 (right) modules

5. Align the top hole of the rear module with the screw hole on the top edge of the frame's back plane.
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.

Note — *When used as an encoder to convert GPIO contact closures to VANC messages, the ONG-MDL-R01, R21 or R23 rear module is required. When used as a decoder to convert VANC messages to GPIO outputs, the following rear modules are available: ONG-MDL-R01, R21 or R23 produces 0-3.3V logic levels, while the ONG-MDL-R02 or R22 provides relay contact closures.*

Board Installation

Use the following procedure to install the GPI-100 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 Frame User Manual*** to ensure that the frame is properly installed according to instructions.
2. After selecting the desired frame installation slot, hold the GPI-100 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 GPI-100 in an openGear distribution frame.

BNC Labels

Affix the supplied BNC label, as per the included instructions, to the BNC area on the rear of the module at the position occupied by the GPI-100.

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. For example, the ONG-MDL-R01 rear module shown in the following illustration has 1-4 and 9-10.

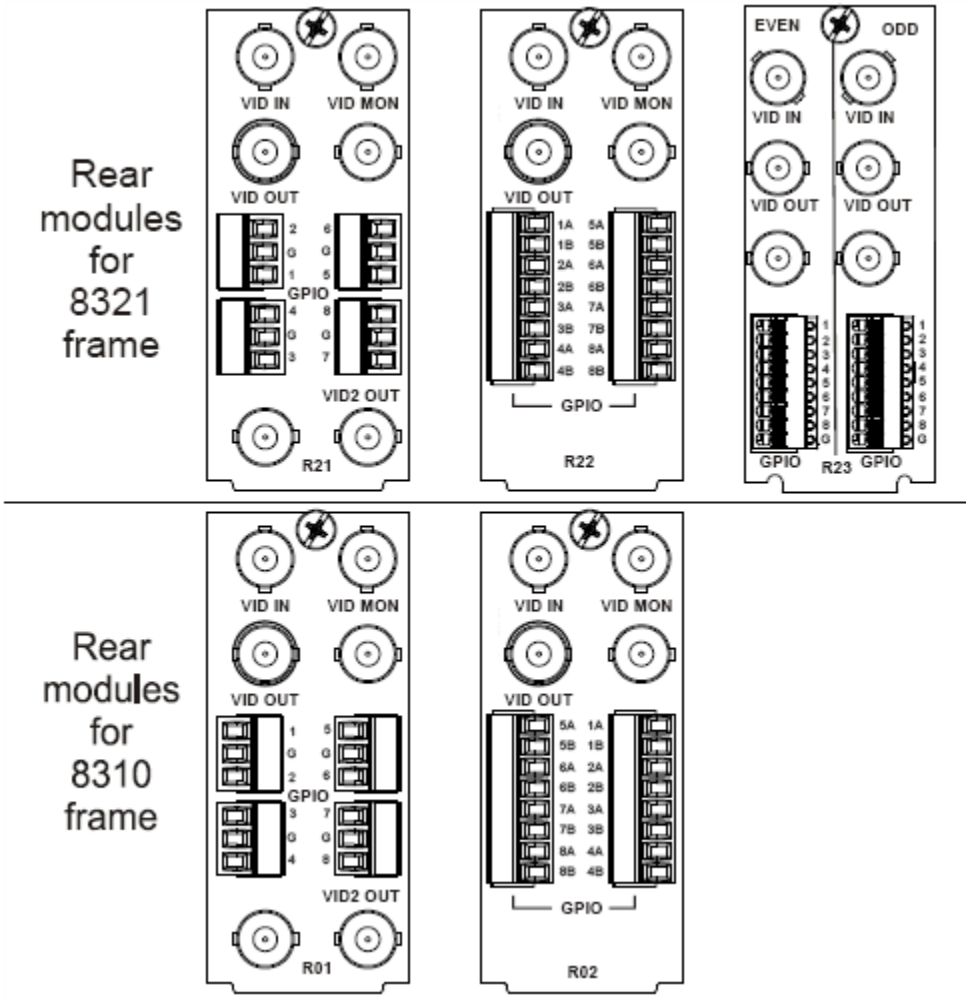


Figure 3. Jack Designations for the GPI-100 with Suitable Rear Modules

BNC 1 SDI Input

This jack accepts an SDI (SMPTE 259) or HD-SDI (SMPTE 292) video signal. The GPI-100 requires this input in all cases. It inserts or extracts VANC packets in this signal and routes the resulting output to BNC3. The input signal is internally terminated in 75 ohms when the GPI-100 is active; when the GPI-100 is in bypass, the termination is provided by the downstream equipment connected to BNC3.

BNC 3 SDI Output

This jack carries the main program output from the GPI-100, consisting of the signal applied to BNC1, with VANC data packets inserted. BNC1 is routed directly to BNC3 (without passing through the GPI-100), under the following circumstances: power off, GPI-100 card removed, GPI-100 Bypass pushbutton out, software selection or certain major error conditions.

BNC 2 SDI Output Monitor

When the GPI-100 is active, this jack carries a copy of the SDI output present on BNC3. This can be useful for test purposes. This jack does not have any bypass capability: with power off or the GPI-100 removed, there is no output signal on this jack.

BNC 4 Analog OSD Output

This jack carries an analog video signal (NTSC/525 or PAL/625) that can be connected to an analog composite video monitor for setup of operating parameters, in conjunction with the GPI-100's Menu Switch.

BNC 10 SDI OSD Output

This jack carries an SDI (SMPTE 259) video signal that can be connected to an SDI video monitor for setup of operating parameters, in conjunction with the GPI-100's Menu Switch.

GPIO1-8 Inputs/Outputs

These jacks are inputs to the GPI-100 when used to encode GPIO triggers into the VANC. These jacks are outputs when GPIO triggers are decoded from the VANC. Note that pairs of GPIOs share a common ground.

Other jacks

As shown in Figure 3, BNC 9 is unused with the GPI-100.

User Controls

In This Chapter

This chapter contains a description of the GPI-100 user controls:

- Switches
- LEDs

User Controls

Figure 4 shows the front edge of the GPI-100. Following the illustration are descriptions of the controls and indicators identified here.

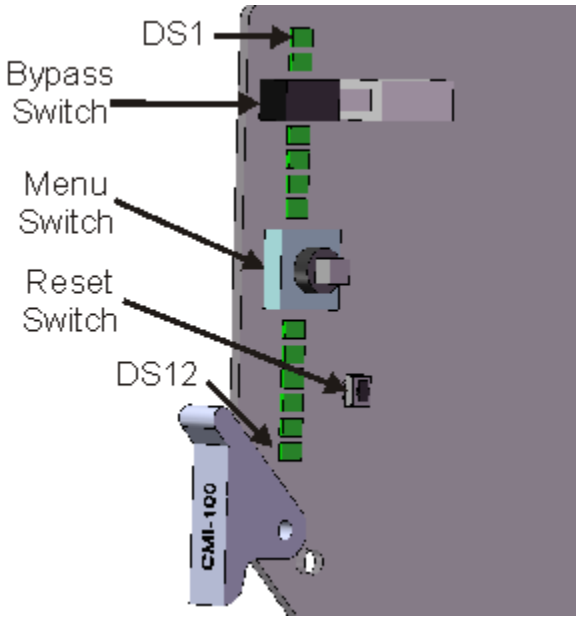


Figure 4. Card-edge User Controls

Bypass Switch

If the GPI-100 is installed in a rear module such as the ONG-MDL-R01 that has a bypass relay, this two-position pushbutton can be used to control the relay. When the pushbutton is in the "IN" position, the GPI-100 is in the video signal path. Pressing it once moves the switch to the "OUT" position and bypasses the GPI-100. Pressing it again restores the GPI-100 to its active state.

Menu Switch

The recommended user interface for the GPI-100 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 either an SDI or analog monitor (NSTC or PAL) to be connected to the GPI-100 card. The **Menu Switch** is a five-direction square finger joystick located near the front edge of the GPI-100 card.

For details on the use of the **Menu Switch** and **OSD**, please see the chapter entitled *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 1. Selection and 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.
Bypass	Off/Red	DS2	When off, GPI-100 is in the video path and is capable of inserting data. When lit red, the GPI-100's video is bypassed.
Program Video In	Red/ Green	DS3	When lit green, the Program Video input is present and valid. When lit red, no valid input is present. This typically means that the input cable is disconnected.
Program Video Out	Red/ Green	DS4	When lit green, the Program Video output serializer is locked to a valid input. When lit red, there is a hardware fault on the card.
Not Used		DS5-8	Not used.
Video Error	Green/ Orange	DS9	Normally lit green. When lit orange, this indicates that there has been an error (e.g. EDH) in the video input stream.
Unknown Rear Module	Green/ Orange	DS10	Normally lit green. When lit orange, this indicates that the rear module connected to the GPI-100 is not one of the types recognized by the software. Operation may not be correct.
Not Used		DS11-12	Not used.

DashBoard and GPI-100 Status

In This Chapter

This chapter provides a detailed explanation of the functions available when using DashBoard to monitor and control the GPI-100. The program is available for download from the Ross Video website.

The following topics are discussed in this chapter:

- Layout and Navigation
- Selecting a GPI-100 Module
- Screen layout
- Status and Setup menus.

Layout and Navigation

This section focuses on the use of the DashBoard program to control and monitor a GPI-100. For a more complete description of DashBoard and its capabilities, please refer to the documentation supplied with the program.

Selecting a GPI-100 Module

Figure 5 shows a typical DashBoard screen. After it has established its connection to the frame containing the GPI-100, a list of modules is displayed at the left side. Clicking on a frame and then on a GPI-100 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 GPI-100 open. DashBoard provides the ability to view multiple devices in this window. For details, see the ***DashBoard Control System User Manual***.

Screen layout

The GPI-100 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 tabs to select more detailed status.
- The right side, the **Settings** area, provides tabs to allow control of the various functions of the module.
- The bottom band contains buttons for functions that are used relatively infrequently.

Product Status

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.

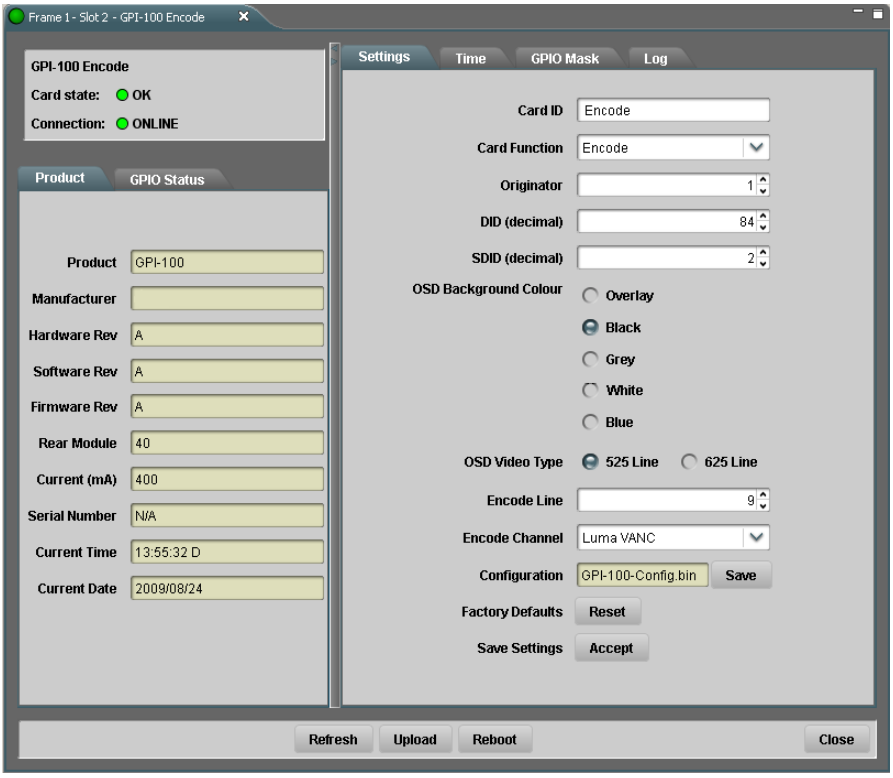


Figure 5. Main GPI-100 DashBoard Screen, showing Product Status and Settings

GPIO Status

Figure 6 shows the status of the eight GPIO inputs/outputs. The status of each of the inputs/outputs is either **Open** or **Closed**. When using a logic-level rear module (ONG-MDL-R01, R21 or R23), **Open** means logic level 1 (3.3V) and **Closed** means logic level 0 (0V).

The chapter, "**Setting Up the GPI-100**" describes how the GPI-100 uses the VANC to transfer GPIOs from an encode card to a decode card.

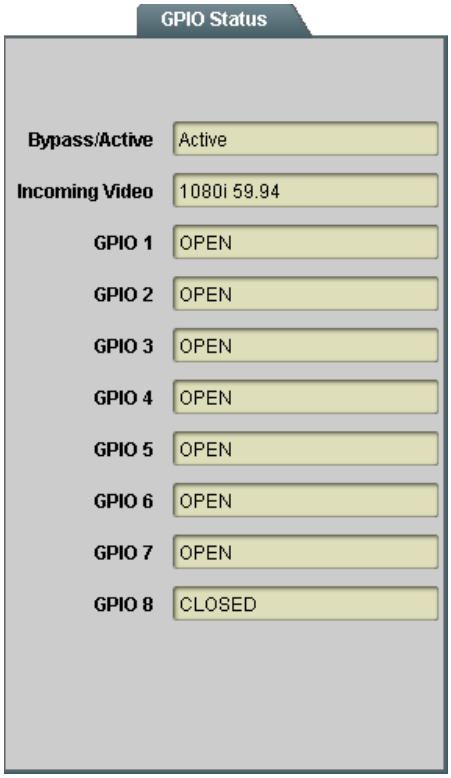


Figure 6. GPIO Input status screen

Setting Up the GPI-100

In This Chapter

This chapter explains how to use the user interface to set up the GPI-100. This discussion is based on the use of DashBoard through a network connection, however most of these functions are also available through the local Heads-up Display.

The following topics are discussed:

- General Settings
- Selecting which GPIOs to use
- Setting the time used when logging GPIO triggers
- Uploading the log of GPIO triggers from the GPI-100 to the PC

General Settings

Figure 7 shows the screen that is displayed by clicking the **Settings** tab. Before proceeding to any of the other sections, please ensure that these settings are correct, as they will have an effect on the operation of the other functions.

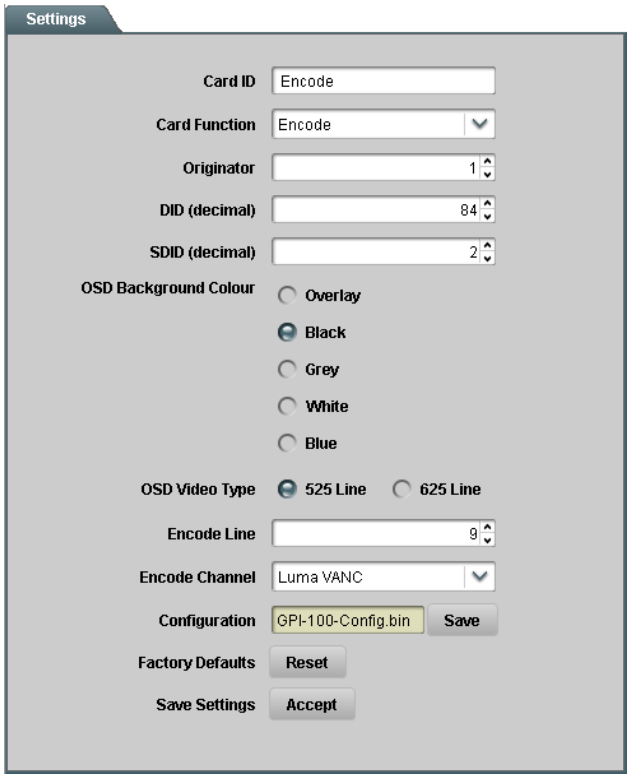


Figure 7. Settings Menu

The **Card ID** field allows you to assign a unique name to a GPI-100 card. This is especially useful if you have more than one GPI-100 in a frame. In this example, the **Card ID** has been set to " – Encode", and the name appearing in DashBoard's device list is consequently "GPI-100 – Encode". If this field were blank, the name would just be "GPI-100".

The **Card Function** determines if the card will be used to **Encode** triggers into the VANC or **Decode** triggers from the VANC. The **Originator** code protects against GPIOs from other originators being detected and should be chosen as a unique value.

The **DID/SDID** is the VANC address used to encoded and decode the triggers. Ross Video has chosen a default address of 84/2 decimal (54/02 hex) for this address. This should not be changed unless it conflicts with existing VANC data. If you need to change it, please set the same address in encoders and decoders.

There are two settings to control the Heads-up Display. The **OSD Video Type** can be set to **525 lines** or **625 lines**, to suit your picture monitor. The **OSD Background Color** is normally black, but other selections are available for your convenience. If the video input is a standard definition SMPTE 259 signal (480i 59.94 or 576i 50), you can select **Overlay** as the background color. This causes the menus to be keyed over the video background. If you select **Overlay** when the video input is HD or absent, the background is black.

The **Encode Line** and the **Encode Channel** may be set on this tab and will be used if the **Card Function** is set to **Encode**. These settings are ignored for the **Decode Card Function** and the card will look for the triggers on any valid line and channel combination.

The **Configuration** of the card may be saved to a file on the PC by clicking on the **Save** button. This brings up a dialog box which allows you to name the file and then, by selecting **Save,** to save it to the PC. Configuration files are a fast way to return to a configuration or to clone a configuration to another GPI-100. Use the Upload button on the bottom of the Dashboard screen to restore a configuration. This brings up a dialog screen which allows you to select one of your saved configurations. This is the same button used to upload new firmware to the card. Dashboard automatically determines the difference between a configuration and a firmware file.

The **Factory Defaults Reset** button clears all configuration settings and restores the settings to as they were shipped from the factory.

The **Save Settings Accept** button makes any settings on this tab permanent. It is important to click on this button before moving to another tab or the changes will not be made and saved.

Selecting GPIOs

The GPI-100 has eight GPIOs. The **GPIO Mask** tab controls which of the eight are active. The GPI-100 will only generate triggers for checked GPIOs in encode mode and will ignore changes in the GPIO state of unchecked GPIOs. While decoding triggers from the VANC, the GPI-100 will only drive GPIOs that are checked. It is therefore possible to have the encode card generate triggers that the decode card will not react to. For example, an encode card could generate GPIO1 and GPIO2 at different times. A decode card could be set to respond to GPIO1 while another card responds to GPIO2.

About GPIO Polarities

Connecting a GPIO input on the encoding GPI-100 to ground (i.e. a **Closed** switch) causes a **Low** logic level. A decoding GPI-100 in an ONG-MDL-R01, R21 or R23 rear module will faithfully reflect this **Low** logic level on the corresponding GPIO output. A decoding GPI-100 in an ONG-MDL-R02 or R22 rear module will **Close** the contact pair on the corresponding GPIO output, thereby faithfully reflecting the closure on the input of the encoder.
An **Open** input on the encoder is a **High** logic level, which will produce a **High** at the output of a decoding GPI-100 in an ONG-MDL-R01, R21 or R23 rear module, and an **Open** at the output of a decoding GPI-100 in an ONG-MDL-R02 or R22 rear module.

In summary, regardless of the rear module type used with the decoder, the GPIO output state of the decoder is identical to the GPIO input state of the encoder.

Setting The Logging Timestamp

The GPI-100 logs any changes of the GPIO state for both the encode and decode cards. For the timestamp to be valid you must have the time set on the GPI-100. There are three possible methods for setting the time; network time server, time code or manually. The **Time Source** pull-down menu on the **Time** tab allows selection on the method.

Timecode

- Automatically gets the time from timecode packets in the VANC .
- User supplies the month day and year if it's not present in the incoming timecode.
- If multiple copies of timecode are present in the signal the GPI-100 uses the last one received.

Network Time

- Specify your time offset from Universal Time (UTC), as a positive number of hours and minutes, and a direction (West or East). For example, the area of North America where Pacific time is observed is 8 hours west of longitude 0; the settings would be **UTC Offset** : **HH=8, MM = 0** and **Hemisphere** = **West**. Note that UTC is also known as GMT (Greenwich Mean Time).
- Enable or disable **DST** (Daylight Savings Time) as appropriate, and click **Accept**.

Manual

- User enters the date and time manually.

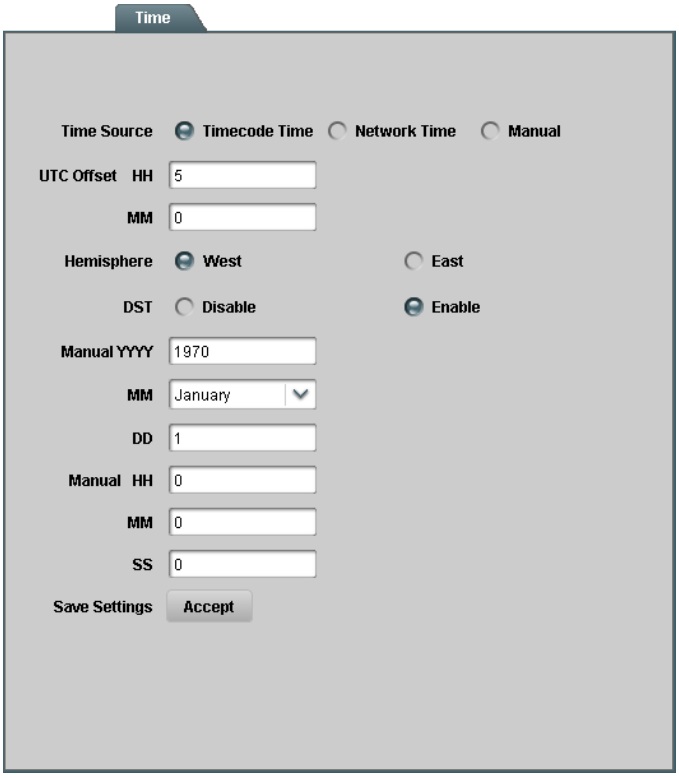


Figure 9. Time Menu

In order to use network time, you also need to ensure that the network card in the openGear frame has been configured to acquire time from an NTP server. To do this, double-click the network card in slot 0 of the frame and then click the **Network** settings tab. In the menu shown below, enter the IP address of the NTP server and then click Apply.

If you do not have access to an NTP server, you can enter the time and date directly on the **Time** settings menu, select **Manual** and click **Accept**.

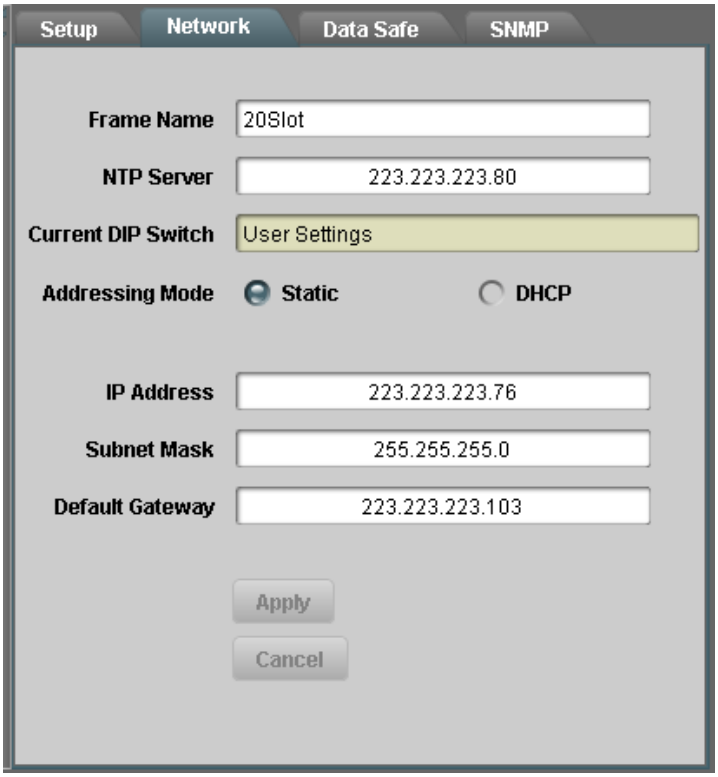


Figure 10. NTP Setup Menu

Uploading Log Files

The **Log** tab shows the last 20 trigger events. An event occurs any time there is a change to any of the GPIOs that are currently enabled. It is logged when a GPIO goes high and also logged when it returns to low. Each log entry is time-stamped with the date and time.

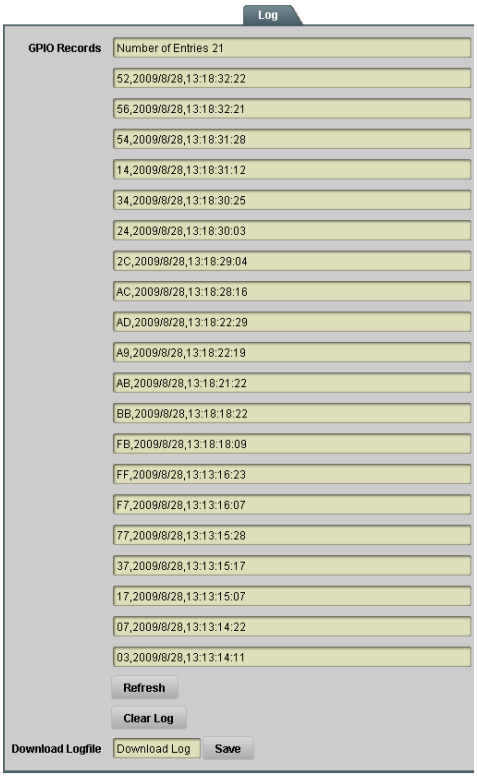


Figure 11. Time Menu

The GPI-100 log is much larger than can be displayed on the Dashboard interface so there is a **Download Logfile Save** button. Clicking this button brings up a dialog box to select a filename for the saved log on the PC. Clicking the Save button on this dialog moves a copy of the logfile to the PC. The logfile is a text file which can be viewed in most text editors.

The first two characters in each log entry are a hexadecimal representation of the state of the 8 GPIOs. GPIO 1 is the least significant bit and GPIO 8 is the most significant bit.

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 GPI-100. 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 GPI-100 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.
- **Back** — Press once to move across columns from right to left.

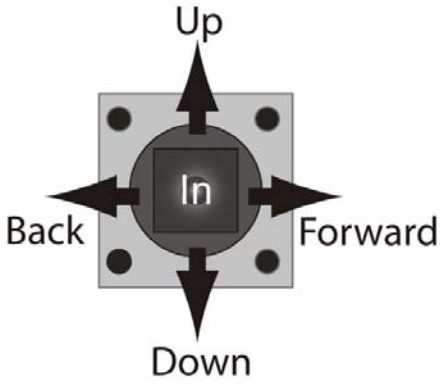


Figure 12. Menu Switch

When the GPI-100 is first powered on, 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 **Alarms** status screen, ***Down*** a second time for **Captured**, and so on. 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 **Alarms** menu, a second time for **Capture**, and so on. 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.

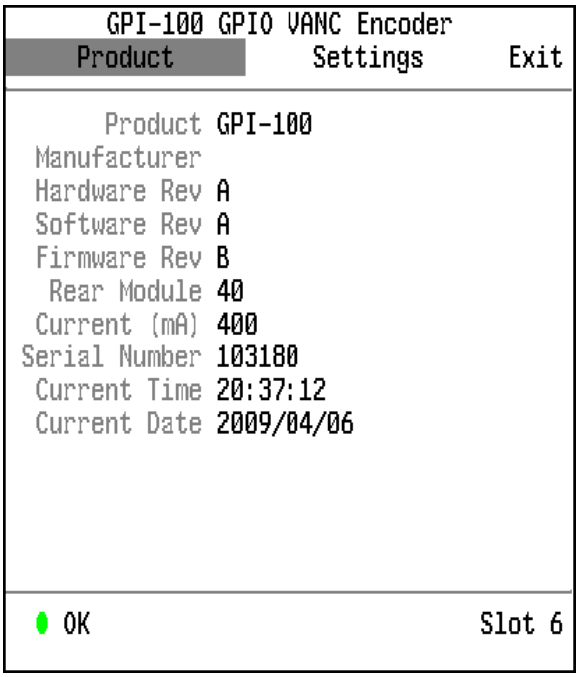


Figure 13. Product Status Screen

Using the Menus

The available screens that can be selected are:

Status (left column)	Setup menus (center column)	Exit (right column)
Product	Settings	Exit
GPIO Status	Time	
	GPIO Mask	
	Log	

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 "**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***.
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 **Card Function** 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.
8. When you reach the desired value (**Encode**), select it by pressing the Menu Switch ***In***.

9. You can repeat steps 5-8 to select values for other items in this menu.
10. To switch to a different menu, press the **Menu Switch *Up*** or ***Down*** repeatedly until the selection bar moves to the title (**Setup Encoding**). Press the **Menu Switch *In*** and return to step 3.

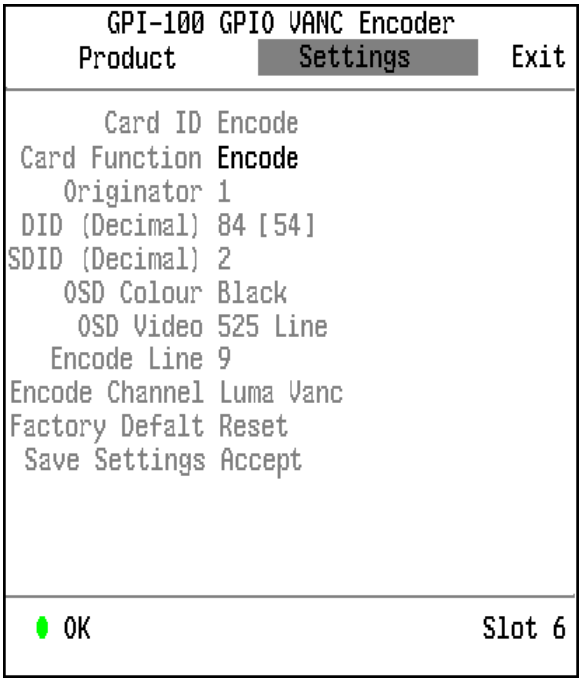


Figure 14. Setting The Card Function

Specifications

In This Chapter

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

Category	Parameter	Specification
Serial Digital Video Inputs	Number Of Inputs	1 Program input (bypass-protected if available in the rear module)
	Data Rates and SMPTE Standards Accommodated	480i/59.94 (SMPTE 259M) 576i/50 (SMPTE 259M) 1080i/50, 59.94, 60 (SMPTE 292M) 720p/50, 59.94, 60 (SMPTE 292M) 1080p/23.98, 24 (SMPTE 292M) 1080sf/23.98, 24 (SMPTE 292M)
	Impedance	75Ω terminating in Active mode Loop-through to SDI Output in Bypass mode, if available in the rear module
	Equalization	Over 100m of Belden 1694A cable @ 1.485Gb/s, or 400m @ 270Mb/s
	Return Loss	>13dB to 1.485GHz
Serial Digital Video Outputs	Number of Outputs	1 Program output 1 output monitor (availability depends on rear module) 1 on-screen display (OSD) 259M output (availability depends on rear module)
	Impedance	75Ω
	Return Loss	10dB to 1.485GHz
	Signal Level	800mV ±10%
	DC Offset	0 Volts ±50 mV
	Rise & Fall Time (20-80%)	700ps. Typical (270Mb/s) 120ps. Typical (1.485Gb/s)
	Overshoot	<8%
Analog video Output	Number of outputs	1 on-screen display (OSD) output (availability depends on rear module)
	Impedance	75Ω
	Signal level	1.0 v
	Formats	NTSC-M or PAL-B/G
GPIO Inputs and outputs	Number of signals	8
	R01,R21,R23 rear module signal type	3.3v CMOS logic levels (8 inputs or 8 outputs)
	R02, R22 rear module signal type	Relay contact closure (8 pairs, outputs only)
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 GPI-100, 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 card is not operational. This will occur if, for example, there is 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 GPI-100. To perform this task, follow these steps:

1. Press and hold the Menu Switch.
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 sent to the card within 60 seconds, the card will attempt to restart with the last operational software load.

Software loads can be sent to the GPI-100 from DashBoard, using the MFC Frame Controller with Networking.

Warranty and Repair Policy

The GPI-100 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 GPI-100 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 GPI-100 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 GPI-100. Ross Video policy dictates that all repairs to the GPI-100 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 GPI-100, 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 GPI-100. 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**	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 Limited**	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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