TSD-100 User Guide

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Our mission is to:

1. Provide a Superior Customer Experience
    - offer the best product quality and support
2. Make Cool Practical Technology
    - develop great products that customers love

Ross has become well known for the Ross Video Code of Ethics. It guides our interactions and empowers our employees. I hope you enjoy reading it below.

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

David Ross
CEO, Ross Video
dross@rossvideo.com

Ross Video Code of Ethics

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

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

TSD-100 · User Guide

- Ross Part Number: 8200DR-312-07
- Release Date: June 5, 2020.

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Patents

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

Notice

The material in this manual is furnished for informational use only. It is subject to change without notice and should not be construed as commitment by Ross Video Limited. Ross Video Limited assumes no responsibility or liability for errors or inaccuracies that may appear in this manual.

Safety Notices

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

Statement of Compliance

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

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

EMC Notices

US FCC Part 15

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

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

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

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

Canada

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

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

European Union

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

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

Australia/New Zealand

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

Korea

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

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

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

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

International

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

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

Maintenance/User Serviceable Parts

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

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

Environmental Information

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

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

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

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

Company Address

Ross Video Limited
8 John Street
Iroquois, Ontario, K0E 1K0
Canada

Ross Video Incorporated
P.O. Box 880
Ogdensburg, New York
USA 13669-0880

General Business Office: (+1) 613 • 652 • 4886
Fax: (+1) 613 • 652 • 4425
Technical Support: (+1) 613 • 652 • 4886
After Hours Emergency: (+1) 613 • 349 • 0006
E-mail (Technical Support): techsupport@rossvideo.com
E-mail (General Information): solutions@rossvideo.com
Website: http://www.rossvideo.com

Contents

Introduction

This guide provides an overview of the TSD-100 Transport Stream Detector. The following chapters are included:

- "**Introduction**" summarizes the guide and provides important terms, and conventions.
- "**Before You Begin**" provides general information to keep in mind before installing and configuring your TSD-100.
- "**Hardware Overview**" provides an overview of the TSD-100 hardware components.
- "**Physical Installation**" provides instructions for the physical installation of the TSD-100 card and its rear module into an openGear frame.
- "**Configuration**" explains how to use the options in DashBoard to set up the TSD-100.
- "**Upgrading the Software**" provides instructions for upgrading the TSD-100 software via DashBoard.
- "**Technical Specifications**" provides the technical specification information for the TSD-100.
- "**Service Information**" provides information on the warranty and repair policy for your TSD-100.
- "**Glossary**" provides a list of terms used throughout this guide.

Related Publications

It is recommended to consult the following Ross documentation before installing and configuring your TSD-100:

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

Documentation Conventions

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

Interface Elements

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

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

User Entered Text

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

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

Referenced Guides

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

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

Menu Sequences

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

Important Instructions

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

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

Contacting Technical Support

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

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

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

Before You Begin

The TSD-100 analyzes an MPEG II Transport Stream, and identifies occurrences of selected components of the stream. For example, SCTE-35 triggers are carried with PID values that are specified by the system operator. The TSD-100 can alert an operator to the occurrence of the SCTE-35 trigger, either by recognizing the splice-insert commands or simply by detecting the presence of the trigger PID.

Overview

The TSD-100 provides a number of innovative tools to simplify your work-flow. For example:

- It can monitor up to 8 selected PIDs and associate them with eight GPIO outputs, allowing you to monitor multiple services with one TSD-100 card.
- In **SCTE-35 trigger** mode, GPIO outputs are controlled by both types of splice-insert (DPI) commands: **Out and In**, and **Out with duration**.
- In **SCTE-35 trigger** mode, the TSD-100 can be set to match on specific values of the **`Splice_insert_ID`** code in addition to the PID, for additional flexibility.
- In **PID detected** mode, each GPIO output is triggered by the arrival of a transport stream packet with the specified PID, and is then negated after a user-specified timeout. This lets you control the duration of the output pulse to meet your system requirements.
- Each GPIO output can indicate either the presence or the absence of a specified PID. For example, it can be asserted for one minute whenever the PID occurs, or it can indicate that the PID has not occurred in the last hour.
- As a member of the openGear family, the TSD-100 shares a common control interface, known as DashBoard, with a broad array of other products.
- Each GPIO output can be specified to either close for the full duration of a trigger, or pulse briefly to indicate the start or end of a trigger.
- An on-board log of trigger events can be browsed from DashBoard, allowing later verification of the occurrence of specific triggers.

For maximum flexibility of configuration, the TSD-100 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.

Features

The following features make the TSD-100 the solution of choice for monitoring selected PIDs in MPEG Transport Streams:

- ASI input on a 75ohm BNC jack located on the rear module
- Up to 8 PIDs can be monitored, corresponding to the maximum of 8 PIDs that can be assigned to SCTE-35 triggers
- DashBoard interfaces for setup and monitoring
- Individual GPIOs can be set to indicate either presence or absence of selected services
- Cards are hot-pluggable for ease of configuration and maintenance
- Relay contact closures for compatibility with a broad range of monitoring equipment
- Supports DataSafe
- Compatible with openGear frames
- Compatible with the openGear frame’s SNMP option
- 5-year transferable warranty

Functional Block Diagram

This section provides the functional block diagram that outlines the work-flow of the TSD-100.

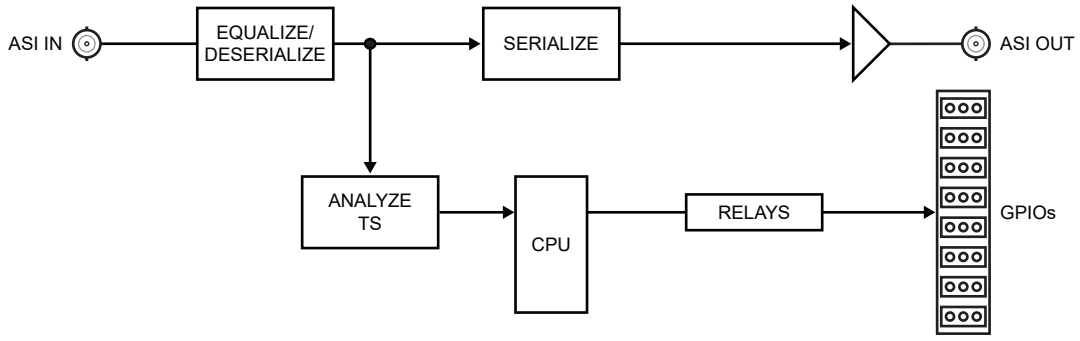


Figure 1.1 Simplified Block Diagram — TSD-100

User Interfaces

The TSD-100 includes the following user interfaces.

DashBoard Control System

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

For More Information on...

- using DashBoard, refer to the ***DashBoard User Manual*** available from our website.

SNMP Monitoring and Control

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

For More Information on...

- the SNMP controls on this card, refer to your TSD-100 Management Information Base (MIB) file.
- SNMP Monitoring and Control, refer to the ***MFC-OG3-N and MFC-8322-S User Guide***.

Hardware Overview

This chapter provides a general overview of the user controls available on the TSD-100.

Overview

The TSD-100 is an openGear modular system composed of two sub-systems.

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

Main PCB Overview

The main PCB is a typical openGear card. An ejector on one end secures the module to the slot inside the openGear frame, and the other end inserts into a connector on the back of the rear module. This section provides a general overview of the TSD-100 card-edge components.

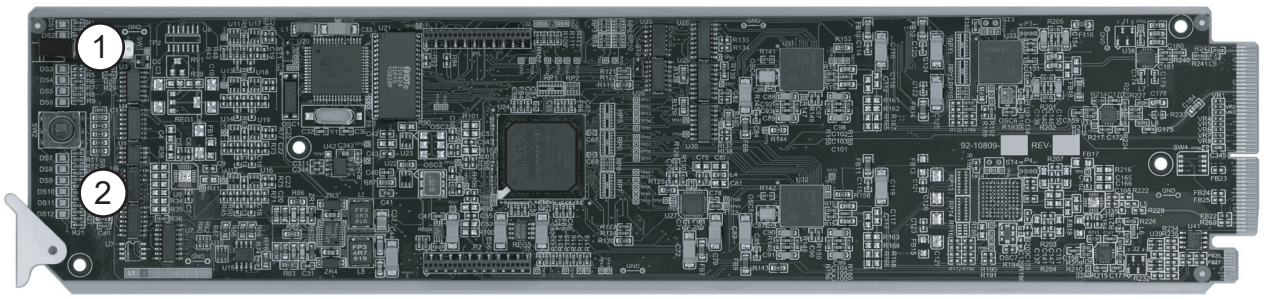


Figure 2.1 TSD-100 — Components

1. Bypass Switch (SW1)

SW1 should be left in the **IN** position at all times when using the MDL-R22 and MDL-R02 rear modules.

2. Reset Switch (SW3)

Use **SW3** to reboot the card.

Control and Monitoring Features

This section provides information on the LEDs for the TSD-100. Refer to **Figure 2.2** for the location of the LEDs.

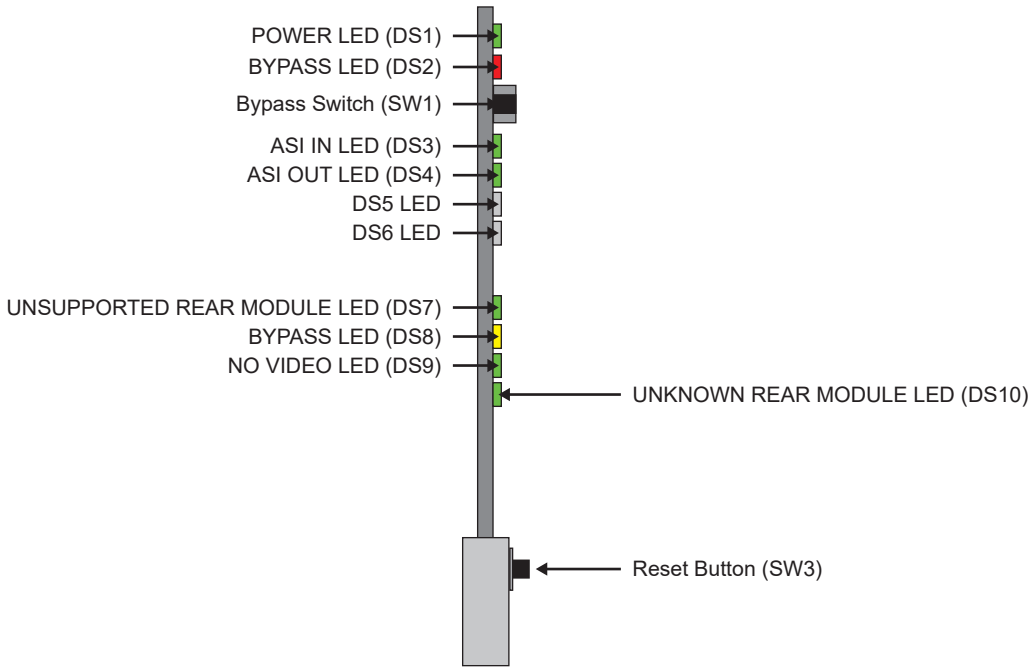


Figure 2.2 TSD-100 Card-edge Controls

Status and Selection LEDs on the TSD-100

The front-edge of the TSD-100 has LED indicators for communication activity. Basic LED displays and descriptions are provided in **Table 2.1**.

Table 2.1 LEDs on the TSD-100

LED	Color	Display and Description
POWER (DS1)	Green	When lit green, this LED indicates that the card is running with a valid input.
	Flashing Green	When flashing green, this LED indicates that the bootloader is waiting for a software upload.
	Yellow	When lit orange, this LED indicates there is a warning for a signal or a configuration error is occurring.
	Red	When lit red, this LED indicates that the card is not operational. This will occur if, for example, there is not video input.
	Off	When off, this LED indicates that there is no power.
BYPASS (DS2)	Red	When lit red, this LED indicates that the card has been disabled by the Bypass switch (MDL-R22 rear modules). With other rear modules with bypass relays, this would indicate that the ASI bypass is engaged.
	Off	When off, this LED indicates the card is in the video path.
ASI IN (DS3)	Green	When lit green, this LED indicates the ASI input is present and valid.
	Off	When unlit red, this LED indicates no valid input is present. Ensure the input cable is connected properly.
ASI OUT (DS4)	Green	When lit green, this LED indicates the ASI output serializer is locked to a valid input.

Table 2.1 LEDs on the TSD-100

LED	Color	Display and Description
DS5	This LED is not implemented.	
DS6	This LED is not implemented.	
Unsupported Rear Module (DS7)	Green	When lit green, this LED indicates a supported rear module.
	Red	When lit red, this LED indicates that the rear module connected to the TSD-100 is not supported by the software. Operation will not be correct.
BYPASS (DS8)	Yellow	When lit yellow, this LED indicates that the card is in the video path.
	Red	When lit red, this LED indicates the card's ASI is bypassed. (redundant with DS2).
NO VIDEO (DS9)	Green	When lit green, this LED indicates a valid video input.
	Red	When lit red, this LED indicates that no video is present at the input.
UKNOWN REAR MODULE (DS10)	Green	When lit green, this LED indicates a supported rear module is installed with the card.
	Orange	When lit orange, this LED indicates this indicates that the rear module connected to the TSD-100 is not one of the types recognized by the software. Operation may not be correct.

Supported Rear Modules for the TSD-100

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

✶ It is not necessary to terminate unused outputs.

MDL-R02 Rear Module

When installing in the DFR-8310 series frames, the TSD-100 is used with the **MDL-R02**. Each rear module occupies one slot and accommodates one card. This rear module provides one ASI input, one ASI output, one on-screen display (OSD) analog output, and relay-isolated GPIO outputs. (**Figure 2.3**)

MDL-R22 Rear Module

When installing in the DFR-8321, OG3-FR, or OGX-FR series frames, the TSD-100 is used with the **MDL-R22**. Each rear module occupies two slots and accommodates one card. This rear module provides one ASI input, one ASI output, one OSD analog output, and relay-isolated GPIO outputs.(**Figure 2.3**)

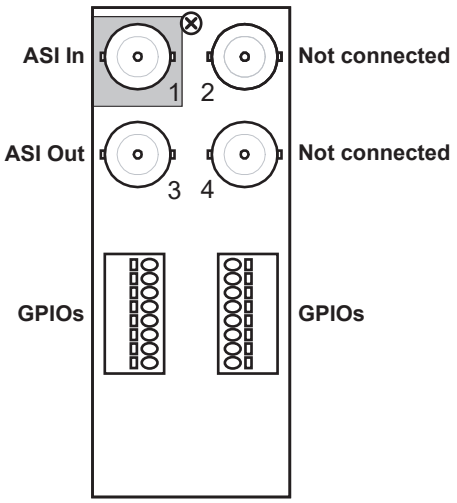


Figure 2.3 Cable Connections for the MDL-R02 and MDL-R22 Rear Modules

Connections Overview

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

ASI In — BNC 1

BNC 1 accepts an ASI video input. The TSD-100 requires this input in all cases. For convenience, it routes a re-clocked copy of this signal to BNC 3. The input signal is internally terminated in 75ohms when the TSD-100 is installed.

ASI Out — BNC 3

BNC 3 carries a re-clocked copy of the ASI signal applied to **BNC 1**.

GPIOs

Two blocks of relay-isolated GPIO outputs are provided on each rear module. Refer to **Figure 2.4** for MDL-R02 pinouts and **Figure 2.5** for MDL-R22 pinouts.

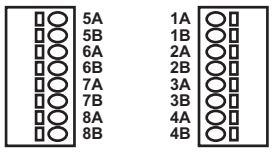


Figure 2.4 GPIO Pinouts for the MDL-R02 Rear Module

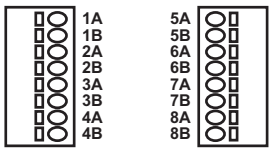


Figure 2.5 GPIO Pinouts for the MDL-R22 Rear Module

Physical Installation

This chapter provides instructions for installing the rear module, and then the TSD-100 into the openGear frame.

Before You Begin

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

Static Discharge

Throughout this chapter, please heed the following cautionary note:

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

Unpacking

Unpack each TSD-100 you received from the shipping container and ensure that all items are included. If any items are missing or damaged, contact your sales representative or Ross Video directly.

Quick Start

Assuming you have an openGear frame, a TSD-100 card, and a compatible rear module, the following steps will get you started with SCTE-35 trigger detection:

1. Connect the openGear frame to your LAN. Refer to the ***OGX-FR Series User Guide*** and ***MFC-OG3-N and MFC-8322-S User Guide*** for details.
2. Ensure that DashBoard is installed on a computer connected to the LAN. The DashBoard software and user manual are available from the Ross Video website.
3. Install the rear module in the frame as described in the section "**Installing a Rear Module**" on page 18.
4. Install the TSD-100 in the rear module as described in the section "**Installing the TSD-100**" on page 19.
5. Connect an ASI signal to the ASI connector on the rear modules as specified in the section "**Connections Overview**" on page 16.
6. Power on the openGear frame.
7. Launch the DashBoard client on your computer. DashBoard should automatically display the frame node in the Basic Tree View.
8. Expand the frame node in the Basic Tree View to display the list of cards installed in that frame.
9. Double-click the TSD-100 node in the Basic Tree View to display a tab in the Device View of the DashBoard client.
10. Set up your triggers as follows:
    a. Select the **SCTE 35 PIDS** tab. Make a note of the PIDs listed.
    b. Select the **GPIO** tab.
    c. Using the PIDs that are listed in the **SCTE 35 PIDs** tab, set up your triggers as outlined in the section "**Defining Triggers**" on page 21.

11. Select the **GPIO Counters** tab. When triggers are received, they will be counted in this tab. Note that this could take some time, since the interval between avails may be 30 minutes or more.
12. Connect wires from the GPIO jacks on the rear panel to your monitoring equipment as described in the section "**Connections Overview**" on page 16.

Installing the TSD-100

This section outlines how to install a rear module and a card in an openGear frame.

Rear Modules for the TSD-100

When installing the TSD-100:

- **DFR-8310 series frames** — The MDL-R02 Full Rear Module is required.

✶ The TSD-100 is not compatible with the DFR-8310-BNC frame.

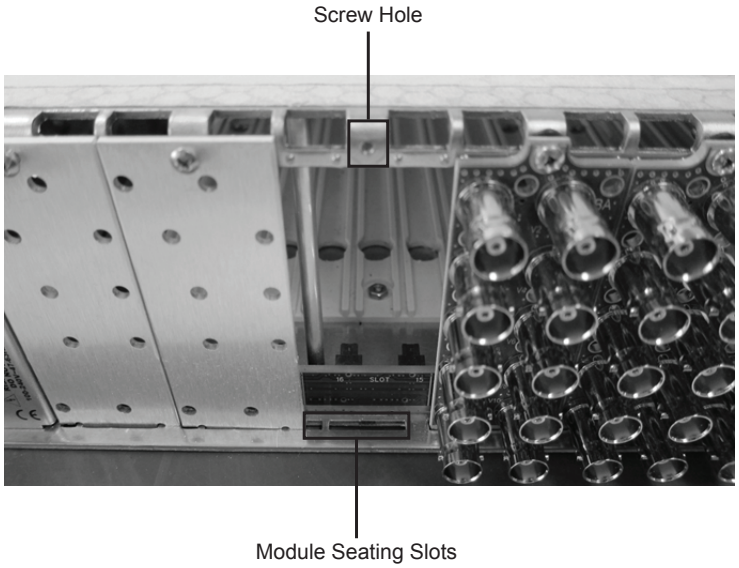
- **DFR-8321**, **OG3-FR**, and **OGX-FR series frames** — The MDL-R22 Full Rear Module is required.

Installing a Rear Module

If the Rear Module is already installed, proceed to the section "**Installing the TSD-100**" on page 19.

To install a rear module in your openGear frame

1. Locate the card frame slots on the rear of the frame.
2. Remove the Blank Plate from the slot you have chosen for the TSD-100 installation.
3. Install the bottom of the Rear Module in the **Module Seating Slot** at the base of the frame's back plane.



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

Installing the TSD-100

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

To install the TSD-100 in an openGear frame

1. Locate the Rear Module you installed in the procedure "**Installing a Rear Module**" on page 18
2. Hold the TSD-100 by the edges and carefully align the card-edges with the slots in the frame.
3. Fully insert the card into the frame until the rear connection plus is properly seated in the Rear Module.
4. Verify whether your label is self-adhesive by checking the back of the label for a thin wax sheet. You must remove this wax sheet before affixing the label.
5. Affix the supplied Rear Module Label to the BNC area of the Rear Module.

Configuration

This chapter explains how to use the user interface to set up the TSD-100. This discussion is based on the use of DashBoard through a network connection.

✶ Wait 30 seconds after the last setting change to ensure all changes are saved to the non-volatile memory of the card.

Defining Triggers

This **GPIO** tab allows you to define the parameters for reporting the presence of individual PIDs in the ASI input.

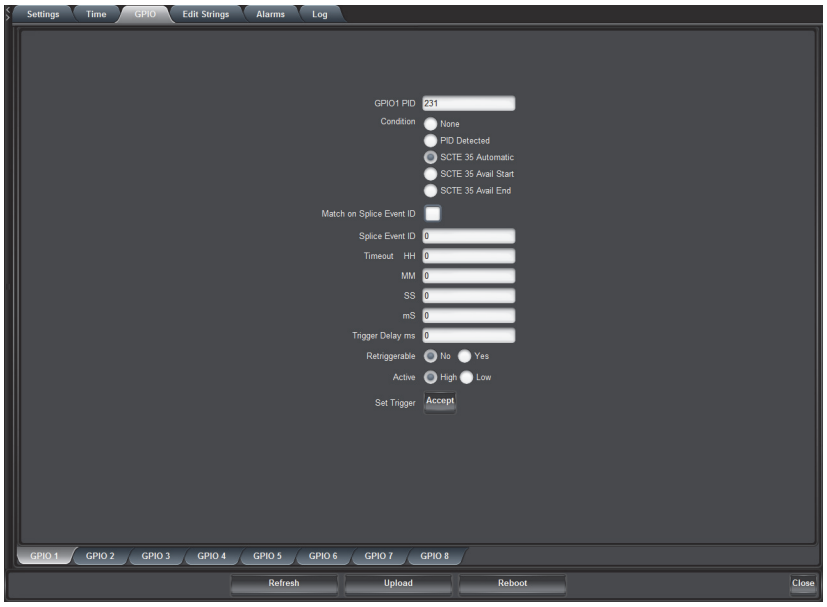


Figure 4.1 GPIO Tab — Settings for SCTE-35 Trigger Presence Detection

For each of the eight GPIO outputs, which you select using the sub-tabs located at the bottom of the **GPIO** tab, you will need to specify the following:

GPIO PID

PID value, in the range 0-8191 decimal.

Trigger Condition

Select one of the following from the Condition options: **PID Detected**, **SCTE-35 Automatic**, **SCTE-35 avail start**, **SCTE-35 avail end** or **None**.

- When **PID Detected** is selected, any packet bearing the specified PID value is treated as a trigger; the GPIO output is asserted for the duration specified by the **Timeout** field.
- When **SCTE-35 Automatic** is selected, the GPIO output changes state when an SCTE-35 “splice-insert” command is received with the specified PID. It is asserted when the “out-of-network-indicator” is 1, and negated when it is 0. That is, it is asserted for the duration of an avail.

General Settings

This section outlines the options displayed by clicking the **Settings** tab.

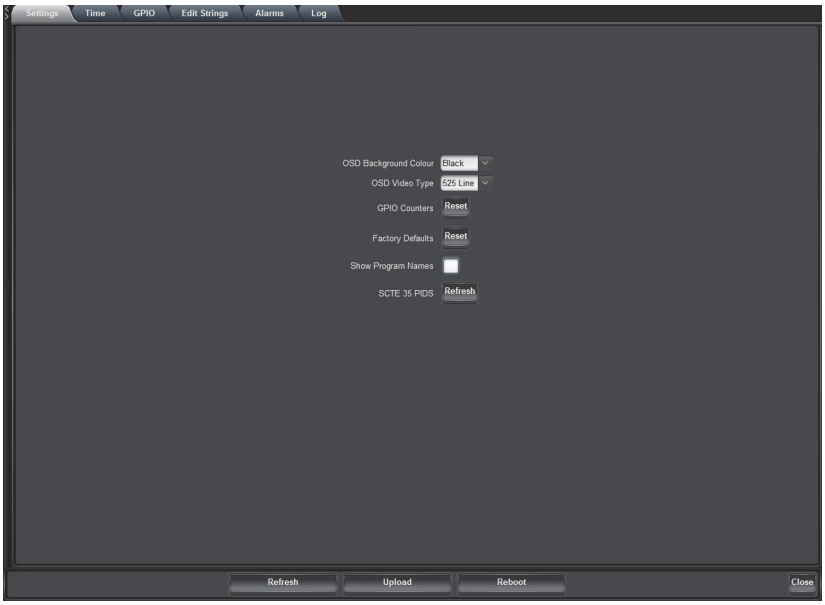


Figure 4.1 Settings Tab

OSD Background Color, OSD Video Type

These menus are not implemented.

GPIO Counters

The **Reset** button clears all trigger counters to 0. Consequently, these counters reflect the number of triggers of each type that have occurred since the last time you clicked this button, or since power-on.

Factory Defaults

The **Reset** button restores the settings of the TSD-100 card to the values they had when you first received the card. This can be a convenient way of returning the card to a known, fixed state.

✶ The TSD-100 supports the DataSafe feature in DashBoard. Refer to the ***MFC-OG3-N and MFC-8322-S User Guide*** for details on using this feature.

Show Program Names

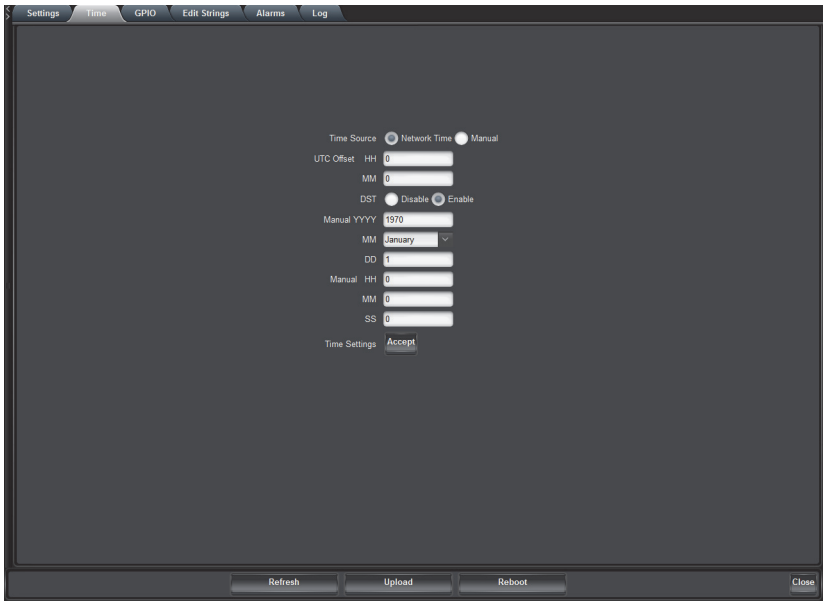
When selected, the **Show Program Names** check box allows decoding of the program names for the SCTE 35 from the Service Descriptor Table (SDT). Before selecting this box, verify that a valid SDT is present in the video signal. Note that the check box is unselected (cleared) by default.

SCTE PIDS

The SCTE 35 PIDs **Refresh** button updates the contents of the SCTE PIDs menu.

Time Settings

The following screen capture shows the screen that is used to set up the time reference for the TSD-100. This is used in time-stamping events as they are recorded in the log.



Time Tab

Time Source

The time source be set to either **Network Time** or **Manual**. If you have access to a Network Time (NTP) server through the openGear frame's LAN connection, you can configure the frame to obtain the time and date from that server. Once this is done, you can select **Network Time** for this setting. This is the preferred method since it is typically very accurate. If you do not have access to an NTP server on your local network, you can try using one on the Internet; see http://support.ntp.org/bin/view/Servers/WebHome for a list of servers. If this is not available, select **Manual** instead.

UFC Offset

UTC Offset HH:MM is the time difference between Standard Time at your location and Universal Coordinated Time (also known as GMT) which is used in NTP services.

- If you are using **Network Time** as described in the previous point, you need to set this value so that the time used in the event log (and displayed on the Product tab) is your local time. The example shows an offset of minus 5 hours, which is correct for Eastern Time in North America. If you are not sure of the offset for your location, visit a time zone Internet site such as http://www.worldtimezone.com.
- If you are using **Manual Time**, set the offset to 0.

DST

DST should be set to **Enabled** if Daylight Saving Time (DST) is observed in your area, and **Disabled** if not. This applies to both **Network Time** and **Manual** time setting methods. During the portion of the year when DST is in effect, this adds one hour to the time, in addition to the offset you specified for Network Time.

Manual Date and Time

Manual Date YYYY/MM/ DD and **Manual Time HH:MM:SS** fields are for use in setting the time manually. If you are using Network Time, leave these blank. If you are using Manual Time, enter the time and date in the indicated format and then click **Time Settings Accept**.

After you have made the desired time settings and clicked **Accept**, the **Product** tab should display your current local time and date. If these are incorrect, check your settings before proceeding.

In order to use network time, you also need to ensure that the Network Controller Card in the openGear frame has been configured to acquire time from an NTP server. To do this, refer to the manual for your Network Controller Card for details.

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

- command contains a duration, the output will be asserted for the specified duration and then automatically negated.
- When **SCTE-35 avail start** is selected, the GPIO output is asserted for a brief period of time when a "splice-insert" command is received with the specified PID and the "out-of-network-indicator" = 1, i.e. at the start of an avail. The pulse duration is set by the **Timeout** parameter.
- **When SCTE-35 avail end** is selected, the GPIO output is asserted for a brief period of time at the end of an avail. This occurs when a "splice-insert" command is received with the specified PID and the "out-of-network-indicator" = 0, or when an avail ends because its duration has expired. The pulse duration is set by the **Timeout** parameter.
- When **None** is selected, the GPIO is disabled.

Match on Splice Event ID and **Splice Event ID**

The Splice Event ID is a number contained in each SCTE-35 splice command. To react to all splice commands on the specified PID, you should leave the **Match on Splice Event ID** box with no check mark; this is the default setting. If you want only a specific value of **Splice Event ID** to trigger the GPIO, you should check this box and enter the desired value. This is a decimal value between 0 and 2,147,483,647. If you do not know the values that are available, define your desired GPIOs with the check box unchecked, wait long enough for each of the triggers to be detected, and examine the Event Log to find the values that have occurred.

Timeout

The Timeout fields are in hours (HH), minutes (MM), seconds (SS) and milliseconds (mS). Note that the duration is somewhat variable and may be up to 0.1 second (100 milliseconds) less than the value specified.

- When the **Trigger Condition** is **PID Detected**, each occurrence of a Transport Stream packet bearing the target PID causes the GPIO output to be asserted for this period of time.
- When the **Trigger Condition** is **SCTE-35 Automatic**, the timeout can be used to clear the GPIO in the event that the "splice-insert" command marking the end of an avail is missed; in this case, it should be set to a larger value than the expected avail duration. When Timeout is set to 0, this automatic clear is disabled and the GPIO follows the "out-of-network-indicator" exactly.
- When the **Trigger Condition** is **SCTE-35 avail start** or **SCTE-35 avail end**, the timeout specifies the duration of the pulse that is produced.

Trigger Delay

This field allows the GPIO pulse signal to be delayed if required for compatibility with connected equipment. This should normally be set to 0 unless you know that a delay is needed. Note that the delay is somewhat variable and may be up to 0.1 second (100 milliseconds) less than the value specified.

Retriggerable

Select between Yes or No as follows:

- If this is set to **Yes** and **Trigger Condition** is **PID Detected**, any occurrences of the target PID that occur while the GPIO is already asserted cause the timeout period to be restarted: the GPIO will remain asserted until one timeout period after the final occurrence of the target PID; if the target PID interval is shorter than the timeout, the GPIO output will stay asserted permanently.
- If this is set to **No**, the TSD-100 ignores any occurrences of the target PID that occur while the GPIO is already asserted. This should be set to **No** when **Trigger Condition** is **SCTE-35 Automatic** or **SCTE-35 avail start** or **SCTE-35 avail end**.

Active

This specifies the state of the relay contacts (**High** or **Low**) when the GPIO is asserted.

Set Trigger

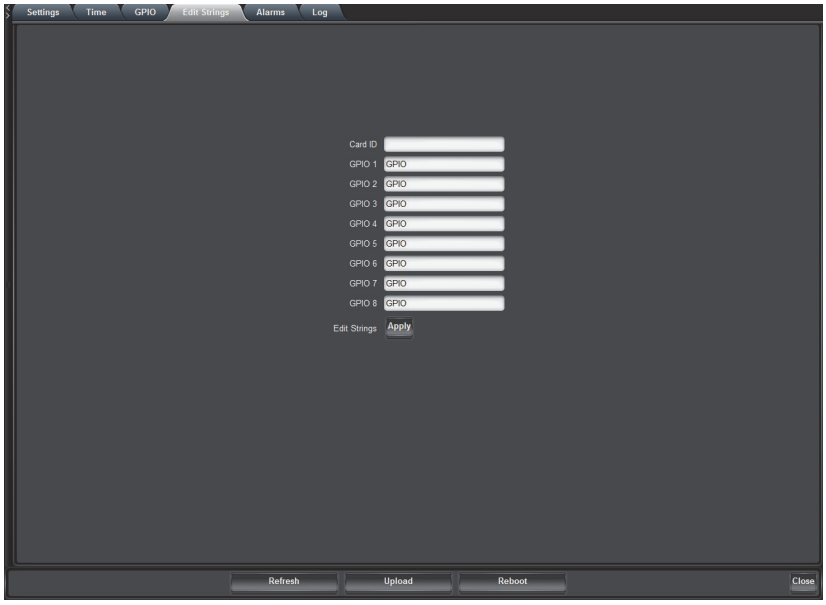
Select **Accept** to apply your changes.

Setting Names

The **Edit Strings** tab allows you to specify names (up to 15 characters each) that you want to assign to the module and to its GPIO outputs, in order to uniquely identify them in your system. The default values for these fields are "GPIO" for each of the **GPIO** outputs and blank for the **Card ID**.

If you enter a **Card ID** and click **Apply** then **Yes**, the new module name will be "TSD-100" followed by the string you typed in (e.g. TSD-100 – Downlink). Since this changes the name of the module, its previous name disappears from the device list in the Basic Tree View and the new name appears in its place.

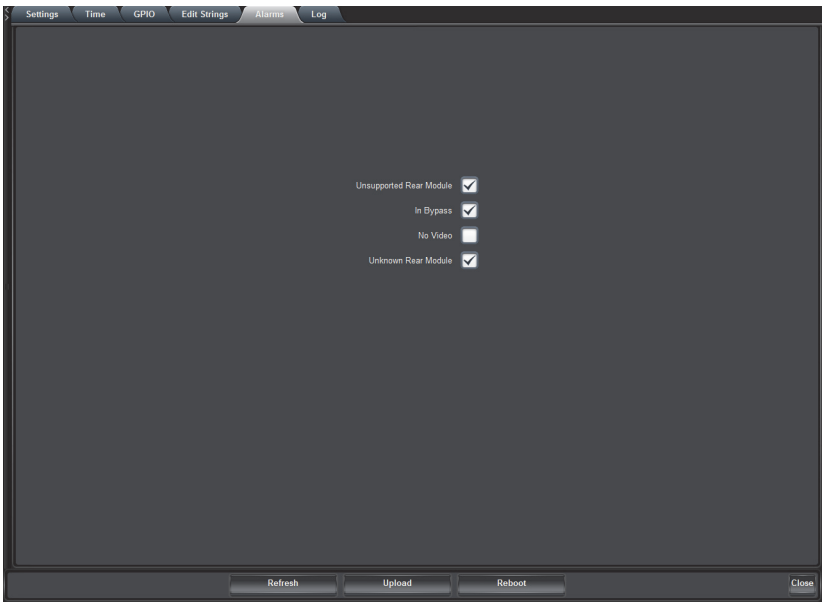
Names that you enter for the GPIOs are used in the **Trigger Counters** and **GPIO Output** status displays. In each case, the GPIO number is also displayed.



Edit Strings Tab

Setting Alarm Sensitivity

The **Alarms** tab allows you to specify which conditions in the TSD-100 will cause an alarm indication on your DashBoard screen and on-screen display output, and an SNMP trap if enabled. Whenever any of the enabled alarm conditions becomes true, the color of the indicator for the TSD-100 on the DashBoard screen switches from green to red.



Alarms Tab

Unsupported Rear Module

An error is reported when the TSD-100 is plugged into an incompatible rear module, which prevents it from operating correctly.

In Bypass

In **Bypass** means that the TSD-100's video is bypassed. This is because the card-edge **Bypass** push-button is in the **Out** position. If this alarm is enabled and this condition occurs, the **In Bypass** field on the **Alarms** status tab displays the message "`In Bypass`". This means that the card is completely disabled.

No Video

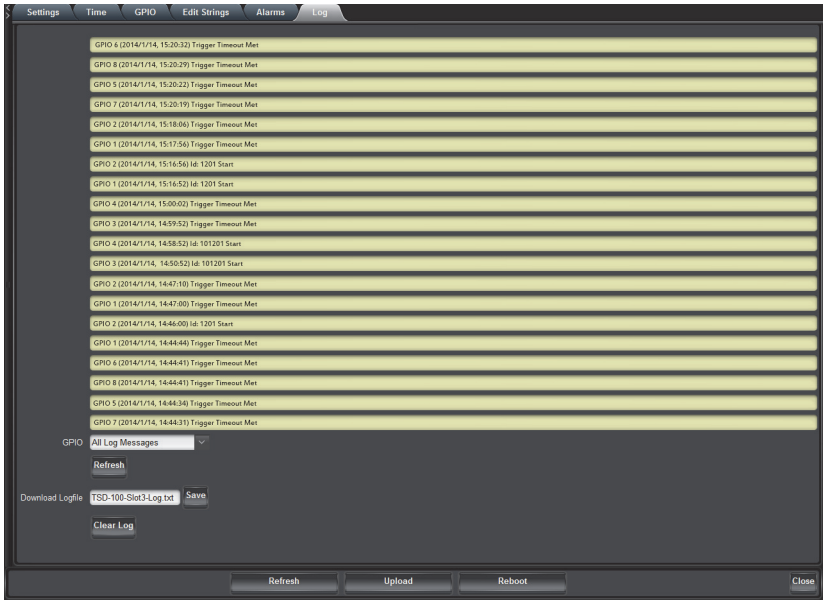
An error is reported when no recognizable signal is detected on the ASI input.

Unknown Rear Module

An error is reported when the TSD-100 is plugged into a rear module that it does not recognize. This means that it may not operate correctly, depending on the connectors and features of the unknown rear module.

Reviewing the Event Log

The TSD-100 maintains a list of trigger events and presents them in reverse chronological order in the **Log** display. An example is shown in the following screen capture. Each entry includes the GPIO number, date and time, Splice Event ID, and type of event. For example: "`GPIO 1 (2008/11/28, 16:13:38) Id:1201 End`".



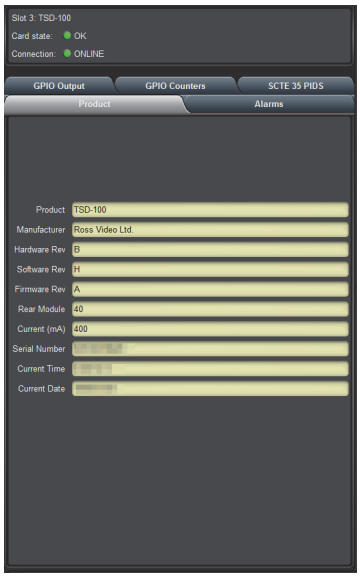
Example of Log Tab with Entries

The **GPIO** selector below the log entries can be used to filter the list entries for display. For example, if you want to examine events that occurred on **GPIO 1** and eliminate clutter caused by other events, select GPIO 1 in this selector and then click **Refresh**. Select **All Log Messages** and **Refresh** to view all events.

The Log tab displays the last 20 of a possible 2000 log entries. At a typical rate of 2 trigger events per hour, it will hold over 20 days of triggers for one GPIO or 2.6 days for eight GPIOs. When it fills, the oldest entries are removed to make room for new ones. You can use the **Download Logfile** feature to save the entire log file as a comma separated text file on your computer.

Monitoring

The **Status** tabs provide read-only information such as software revision issue and signal status of the TSD-100. The fields in the **Status** tabs vary in severity from green (valid) to red (alarm). DashBoard reports the most severe alarm for a single field.



Status Tabs — Product Tab Selected

Product Tab

The **Product** tab provides read-only information, such as board revision, serial number, and rear module type. This information is helpful to a Ross Video technical support when there are questions about the operation of the unit.

Alarms Tab

The alarm conditions listed in the Alarms status tab are qualified by the selections made on the Alarms setup tab.

- **Card Status** — Any error conditions that are checked on the Alarms setup tab will cause the Card Status field to report red when they occur. Alarm conditions that are unchecked will be ignored.
- **Unsupported Rear Module** — This fields reports when the TSD-100 does not work properly with this rear module; for example, it may be missing jacks that are essential for the TSD-100 operation.
- **In Bypass** — This field reports when the on-board Bypass push-button has been activated. This may be an error condition, since it disconnects the card's ASI input if the rear module provides bypass capability.
- **No Video** — This field reports when the ASI input signal is not connected to a valid ASI video source.
- **Unknown Rear Module** — This field reports when the TSD-100 does not recognize this rear module and thus may not work properly.

GPIO Output Tab

The **GPIO Output** tab reports the present state of the eight GPIO outputs including the video type and bypass state, as well as the present state of each of the eight GPIO outputs.

When using the TSD-100 with a rear module that provides relay contacts, the states are listed as "Open" or "Closed". Otherwise the states would be listed as "High" or "Low", reflecting the corresponding logic levels.

GPIO Counters Tab

The **GPIO Counters** tab displays information about occurrences of each of the trigger events that the user has defined.

- The left-most number in these fields is the cumulative number of trigger events that have occurred since the counters were last reset. The **Settings** tab has a Trigger Counters **Reset** button that restores all counters to 0.
- The **Elapsed** time is the running time since the most recent occurrence of the trigger event.
- The second timestamp, if one is displayed, is the last observed Interval between triggers.

Refer to the section "**Defining Triggers**" on page 21 for details on how to set up the GPIOs to reflect the presence of SCTE-35 triggers or specified PIDs in the ASI input, and how to specify the names of the services associated with these triggers. The names are GPIO 1 through GPIO 8 by default. You can change the names using the options in the **Edit Strings** tab.

SCTE 35 PIDs Tab

The **SCTE 35 PIDs** tab provides a list of all SCTE 35 trigger PIDs that are defined in the incoming Transport Stream (TS). The Program Association Table (PAT) contains Program Numbers and PIDs that are used to find the Program Map Tables (PMTs). PMTs may contain the PIDs of SCTE 35 triggers. For each program that contains triggers, the program number and trigger PID are displayed in the list. If the Service Descriptor Table (SDT) is present, the names of the programs are also displayed. This list is constantly refreshed from the incoming TS.

The PIDs listed in this tab are the information that you will need to enter in the **GPIO** tab, as discussed in earlier in this chapter. Note that this tab only displays the triggers that are expected to be present in the TS, based on the information in the PMTs. The presence of the triggers themselves is shown in the **GPIO Counters** tab.

Upgrading the Software

Your TSD-100 can be upgraded in the field via DashBoard.

To upgrade the software on a TSD-100

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

✶ If you are running DashBoard version 2.3.0 or lower, you must click **Reboot** in the **Device** tab to complete the upgrade process.

Troubleshooting

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

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

Technical Specifications

This chapter provides the technical specification information for the TSD-100.

✶ Technical specifications are subject to change without notice.

Table 6.1 TSD-100 Technical Specifications

Category	Parameter	Specification
Transport Stream Inputs	Number of Inputs	1
	Input Signal Standard Accommodated	DVB-ASI (EN 50083-9)
	Impedance	75ohm terminating
	Equalization	Over 100m of Belden 1694A cable
	Return Loss	>15dB to 270MHz
Transport Stream Outputs	Number of Outputs	1 ASI input monitor
	Impedance	75ohm
	Return Loss	>10dB to 270MHz
	Signal Level	800mV ±10%
	DC Offset	0Volts ±50mV
	Rise and Fall Time	700ps. typical
	Overshoot	<8%
Analog Video Output	Number of Outputs	1
	Impedance	75ohms
	Signal Level	1.0v
	Formats	NTSC-M or PAL-B/G
GPIO Outputs	Number and type of outputs	8 pairs of isolated contacts (Max 0.1A)
Power	Maximum Power Consumption	5W

Service Information

Troubleshooting Checklist

Routine maintenance to this openGear product is not required. In the event of problems with your TSD-100, the following basic troubleshooting checklist may help identify the source of the problem. If the frame still does not appear to be working properly after checking all possible causes, please contact your openGear products distributor, or the Technical Support department at the numbers listed under the "**Contact Us**" section.

1. **Visual Review** — Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the card, the frame, and any associated peripheral equipment for signs of trouble.
2. **Power Check** — Check the power indicator LED on the distribution frame front panel for the presence of power. If the power LED is not illuminated, verify that the power cable is connected to a power source and that power is available at the power main. Confirm that the power supplies are fully seated in their slots. If the power LED is still not illuminated, replace the power supply with one that is verified to work.
3. **Re-seat the Card in the Frame** — Eject the card and re-insert it into the frame.
4. **Check Control Settings** — Refer to the Installation and User Controls sections of this manual to verify all user-adjustable component settings
5. **Input Signal Status** — Verify that source equipment is operating correctly and that a valid signal is being supplied.
6. **Output Signal Path** — Verify that destination equipment is operating correctly and receiving a valid signal.
7. **Unit Exchange** — Exchanging a suspect unit with a unit that is known to be working correctly is an efficient method for localizing problems to individual units.

Reset Button

In the unlikely event of a complete card failure, you may be instructed by a Ross Technical Support specialist to perform a complete software reload on the TSD-100.

Warranty and Repair Policy

The TSD-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 TSD-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 TSD-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 TSD-100 User Manual provides all pertinent information for the safe installation and operation of your openGear Product. Ross Video policy dictates that all repairs to the TSD-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 TSD-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 TSD-100. If required, a temporary replacement frame will be made available at a nominal charge. Any shipping costs incurred will be the responsibility of you, the customer. All products shipped to you from Ross Video Limited will be shipped collect.

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

Glossary

The following terms are used throughout this guide:

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

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

CBR — constant bit rate.

CDN — content distribution network.

DashBoard — the DashBoard Control System.

DF — Differentiated Services.

DTVCC captions — CEA-708 captions.

Frame — the openGear frame frame that houses the TSD-100.

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

Metadata — some of the VANC data that the TSD-100 monitors (such as closed captioning) is “data essence”, not metadata. For convenience, this manual uses the term “metadata” to refer to all VANC data types.

MIB — management information base.

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

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

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

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

PCR — program clock reference.

PID — packet identifier.

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

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

TPG — Test Packet Generator.

User — the person who uses the TSD-100.

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