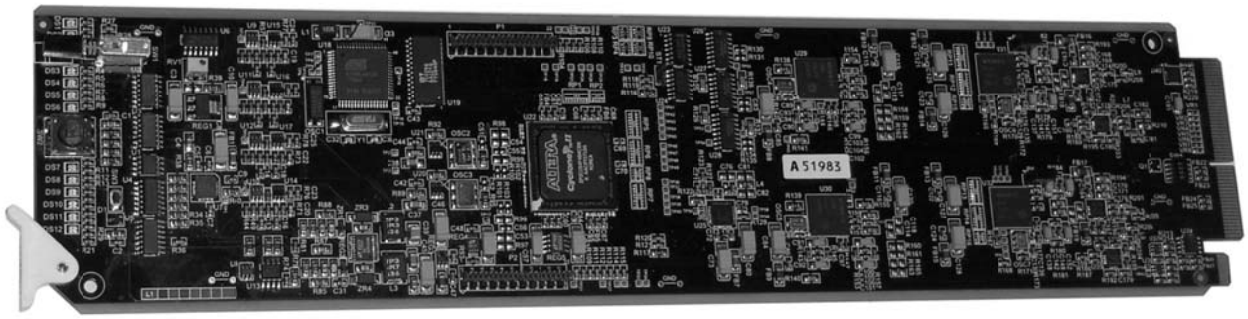
Ross Video Limited

TSD-100

Transport Stream Detector

User Manual



Live Production Technology

openGear

TSD-100 • Transport Stream Detector User Manual

- Ross Part Number: **TSD100DR-004-02**
- Release Date: September 21, 2010. Printed in Canada.

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Notice

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Trademarks

Important Regulatory and Safety Notices

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

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

Symbol Meanings

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

Warning

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

Caution

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

Notice

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

ESD Susceptibility

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

Important Safety Instructions

Caution

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

Warning

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

Warning

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

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

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

Only use attachments/accessories specified by the manufacturer.

EMC Notices

US FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.

Notice

Changes or modifications to this equipment not expressly approved by Ross Video 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.

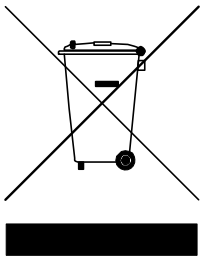
Environmental Information

The TSD-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 TSD-100 Transport Stream Detector. The TSD-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 TSD-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 Limited customers!

Should you have a question pertaining to the installation or operation of your TSD-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 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.

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

- It can monitor up to 8 selected PIDs and associate them with 8 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.
- The optional ONG-MDL-R02 rear connector module provides isolated relay contact closures for the eight GPIOs. .
- 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.

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

- ASI input on a 75-ohm 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.
- Both GUI and card-edge user interfaces for setup and monitoring.
- Non-volatile settings allow "set-and-forget" operation.
- Individual GPIOs can be set to indicate either presence or absence of selected services.

- Fits openGear DFR-8300 series frames, allowing up to 10 Transport Streams and 80 PIDs to be monitored in a single 10-slot frame.
- Cards are hot-pluggable for ease of configuration and maintenance.
- Relay contact closures for compatibility with a broad range of monitoring equipment.
- The TSD-100 is 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

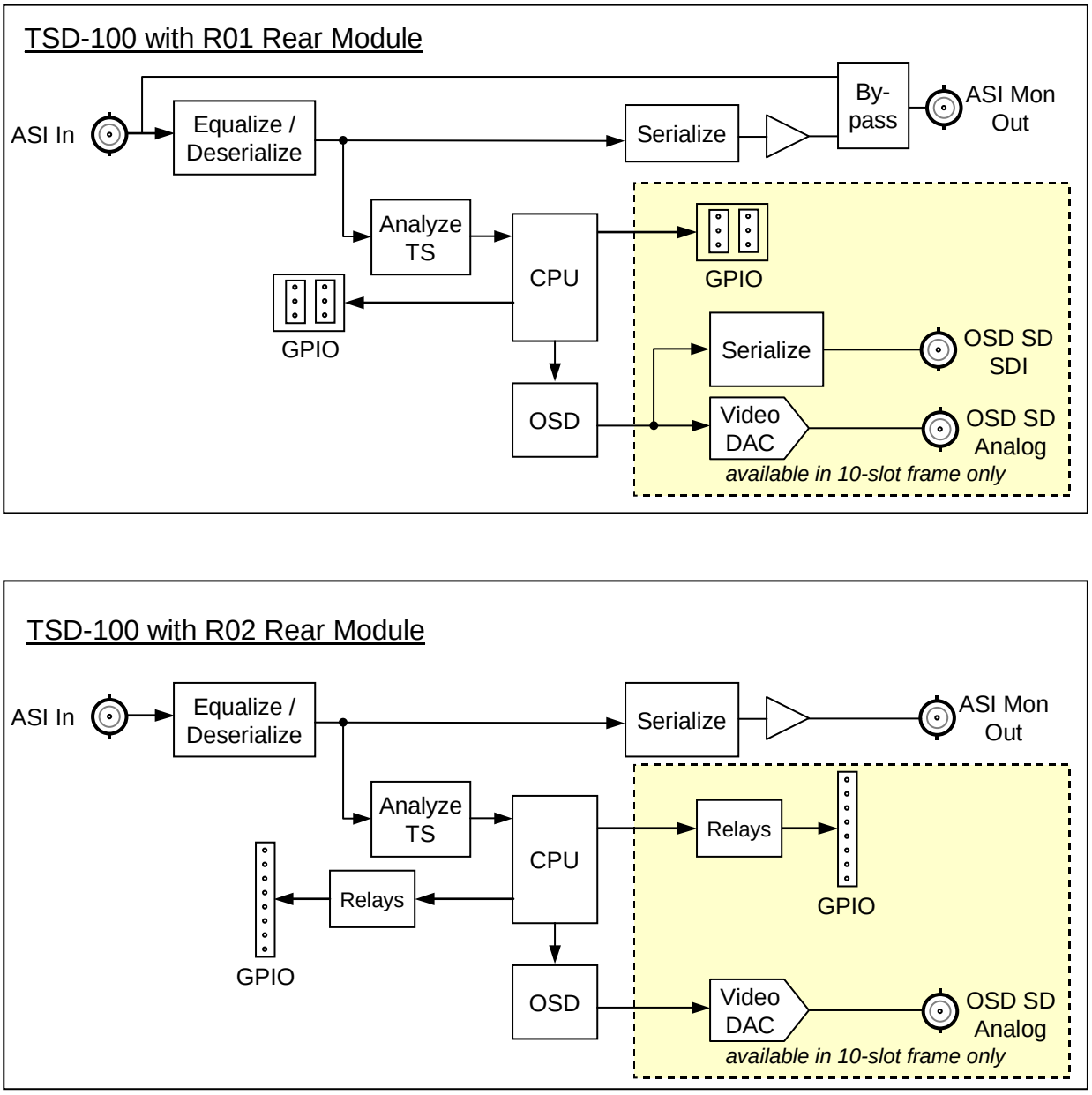


Figure 1. Simplified Block Diagram of** TSD-100 **Functions

Frame and Rear Module Compatibility

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

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

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

Documentation Terms

The following terms are used throughout this guide:

- "**Frame**" refers to the openGear frame that houses the TSD-100 card.
- "**Operator**" and "**User**" refer to the person who uses the TSD-100.
- "**Board**" and "**Card**" refer to the TSD-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 TSD-100 operates.
- "**Rear Module**" refers to the connector module at the rear of the frame, into which the TSD-100 is inserted.

Quick Start

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

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, using the link provided in the section "**DashBoard Interface**" of this manual.
3. Install the rear module in the frame, as described in the section "**Rear Module Installation**" section of this manual.
4. Install the TSD-100 into the rear module, as described in the section "**Board Installation**" of this manual.
5. Connect an ASI signal to the ASI jack on the rear module as described in the section "**Cable Connections**" of this manual, and turn the frame power on.
6. 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 TSD-100.
7. Click the SCTE 35 PIDS tab. The display should be similar to the one in the section "**SCTE 35 PIDS**" of this manual.
8. Click the GPIO tab. Using the PIDs that are listed in the SCTE 35 PIDS display, set up your triggers as shown in the section "**Defining Triggers**" of this manual.
9. Click the GPIO Counters tab. When triggers are received, they will be counted here. Note that this could take some time, since the interval between avails may be 30 minutes or more.
10. Connect wires from the GPIO jacks on the rear panel to your monitoring equipment, as described in the section "**GPIO Outputs**" of this manual.

Installation and Setup

In This Chapter

This chapter contains the following sections:

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

Static Discharge

Whenever handling the TSD-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

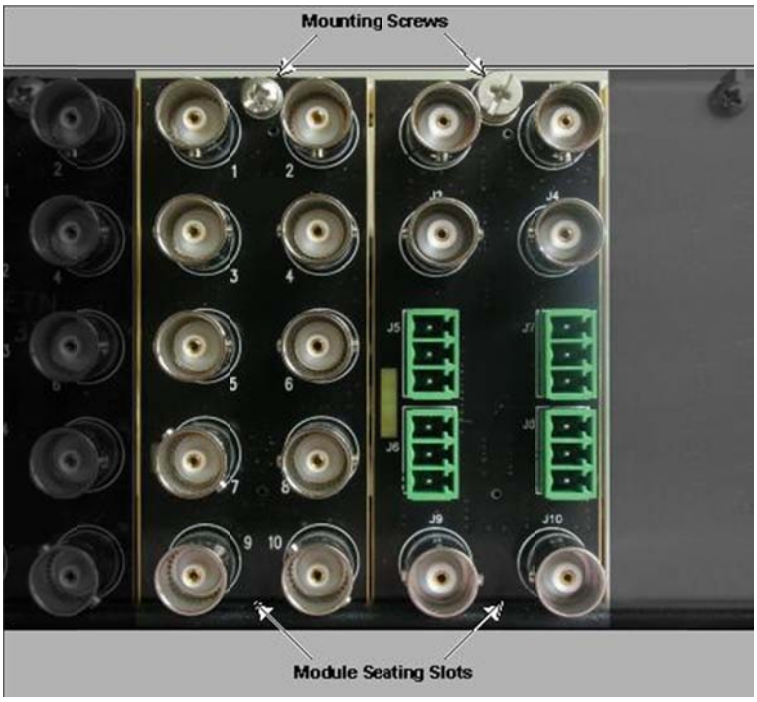
Unpack each TSD-100 you received from the shipping container, and check the contents against the packing list to ensure that all items are included. If any items are missing or damaged, contact your sales representative or Ross Video Limited directly.

Rear Module Installation

Figure 2 below shows two rear modules mounted on an openGear frame. If you received a rear module with your TSD-100, you will need to install it in your frame before you can install the TSD-100 or connect cables to the slot you have chosen for it.

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

1. Refer to the ***DFR-8300 Series Frames User Manual***, to ensure that the frame is properly installed according to instructions.
2. On the rear of the frame, locate the card frame slot.
3. Remove the Blocker Plate (if any) from the rear of the slot you have chosen for the TSD-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.



iodules

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 frame's back plane. Do not over-tighten.
7. Ensure proper frame cooling and ventilation by having all rear frame slots covered with rear I/O modules or blank metal plates. If you need blanks, contact your openGear sales representative.

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

Board Installation

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

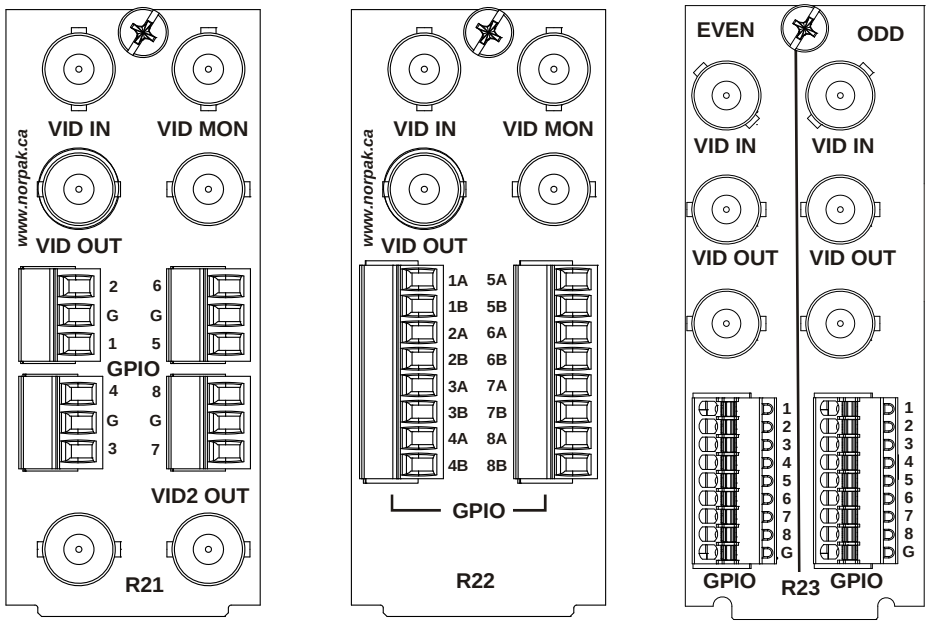
BNC Labels

Affix a connector label (if supplied) to the rear of the rack frame at the position occupied by the TSD-100. Some rear modules do not require a label, as the connector names are silkscreened directly onto the rear module itself.

Cable Connections

This section provides information for connecting cables to the installed rear module on the frame backplane. Connect the input and output cables according to the following diagram. It is not necessary to terminate unused outputs. 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.

Rear modules for 8321 frame



Rear modules for 8310 frame

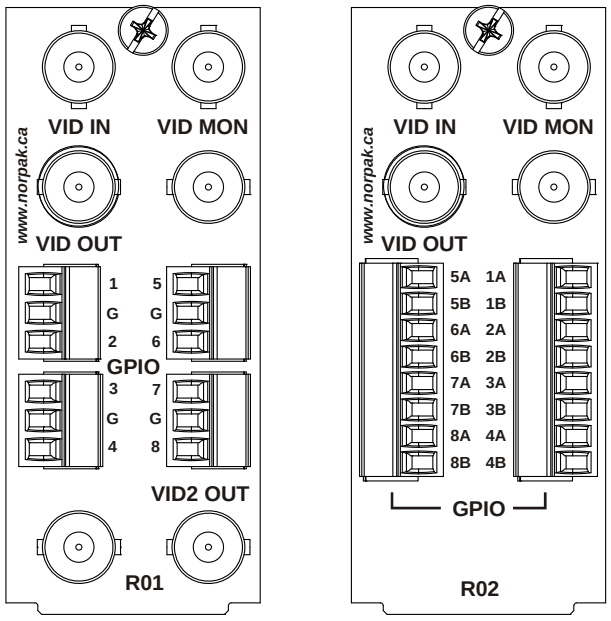


Figure 3. Jack Designations for the** TSD-100 **with compatible rear modules

BNC 1 ASI Input (May be labelled VID IN or SDI IN)

This jack accepts an ASI video signal. The TSD-100 requires this input in all cases. For convenience, it routes a re-clocked copy of this signal to BNC3. The input signal is internally terminated in 75 ohms when the TSD-100 is installed.

BNC 3 ASI Output (May be labelled VID OUT or SDI OUT)

This jack carries a re-clocked copy of the ASI signal applied to BNC1. When the TSD-100 card is removed from its slot, the **ONG-MDL-R01, ONG-MDL-R21** or **ONG-MDL-R23** rear module bypasses BNC1 to BNC3 directly.

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 TSD-100's Menu Switch.

BNC 10 SDI OSD Output (ONG-MDL-R01 / R21 modules only)

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 TSD-100's Menu Switch.

User Controls and Indicators

In This Chapter

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

- Switches
- LEDs

User Controls

Figure 6 shows the front edge of the TSD-100. Following the illustration are descriptions of the controls and indicators identified here.

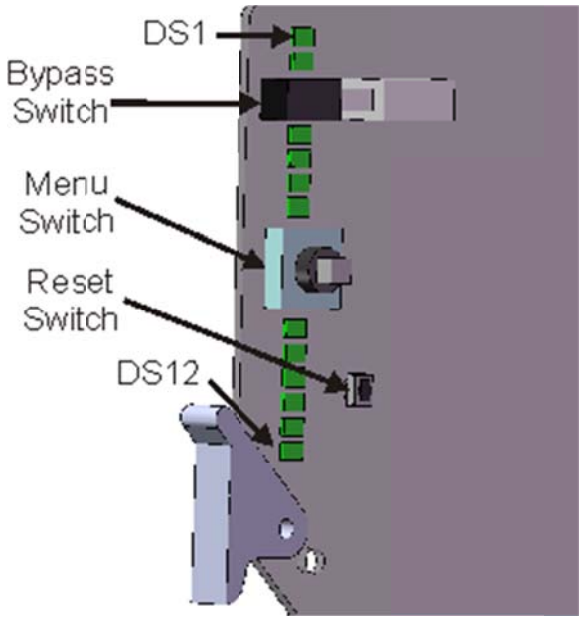


Figure 4. Card-edge User Controls

Bypass Switch

If the TSD-100 is installed in an ONG-MDL-R02 rear module, this switch has no function. If the TSD-100 is installed in an ONG-MDL-R01 rear module 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 TSD-100 is in the ASI signal path. Pressing it once moves the switch to the "OUT" position and bypasses the TSD-100. Pressing it again restores it to its active state. This function is of limited value in the TSD-100, except as a way of quickly disabling all PID detection, since it disconnects the ASI input from the card.

Menu Switch

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

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

Reset Switch

This button is used for rebooting the card.

LEDs

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

Table 2. 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	Red	DS2	When off, TSD-100 is in the video path. When lit red, the TSD-100's ASI is bypassed.
ASI In	Green	DS3	When lit green, the ASI input is present and valid. When not lit, no valid input is present. This typically means that the input cable is disconnected or the signal is not ASI (e.g. SDI or HD-SDI)
ASI Out	Green	DS4	When lit green, the ASI output serializer is locked to a valid input.
Not used		DS5	
OSD SDI Out	Green	DS6	When lit green, the OSD output serializer is locked to the on-board oscillator.
Unsupported Rear Module	Red/ Green	DS7	Normally lit green. When lit red, this indicates that the rear module connected to the TSD-100 is not supported by the software. Operation will not be correct.
Bypass	Red/ Green	DS8	Normally lit green. When lit red, the TSD-100's ASI is bypassed (redundant with DS2).
No Video	Red/ Green	DS9	Normally lit green. When lit red, no valid input is present (redundant with DS3).
Unknown Rear Module	Orange/ Green	DS10	Normally lit green. When lit orange, this indicates that the rear module connected to the TSD-100 is not recognized by the software. Operation may not be correct.

DashBoard and TSD-100 Status

In This Chapter

This chapter provides an introduction to the DashBoard user interface and a description of the TSD-100's Status screens. The DashBoard program is available for download at the Ross Video website.

The following topics are discussed in this chapter:

- Layout and Navigation
- Selecting a TSD-100 Module
- Screen layout
- Status screens.

The use of the **Setup** menus is covered in the chapter "**Setting up a TSD-100**".

Layout and Navigation

This section focuses on the use of the DashBoard program to control and monitor TSD-100. For a more complete description of DashBoard and its capabilities, refer to the ***DashBoard Software User Manual***.

Selecting a TSD-100 Module

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

The module name is displayed in the device list and on the tab for the module. In this example, the name "TSD-100 - Downlink" has been assigned by the user. The Edit Strings menu allows you to assign a Card ID. In this case, it was set to " - Downlink", which is appended to "TSD-100" to produce the name of the module. If you have multiple TSD-100 modules, this feature allows you to easily recognize them in your DashBoard display.

Screen layout

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

Product Status

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

It also shows the current time and date. This allows you to verify that these are correct; this is important since they are used in time-stamping the events that are recorded in the log.

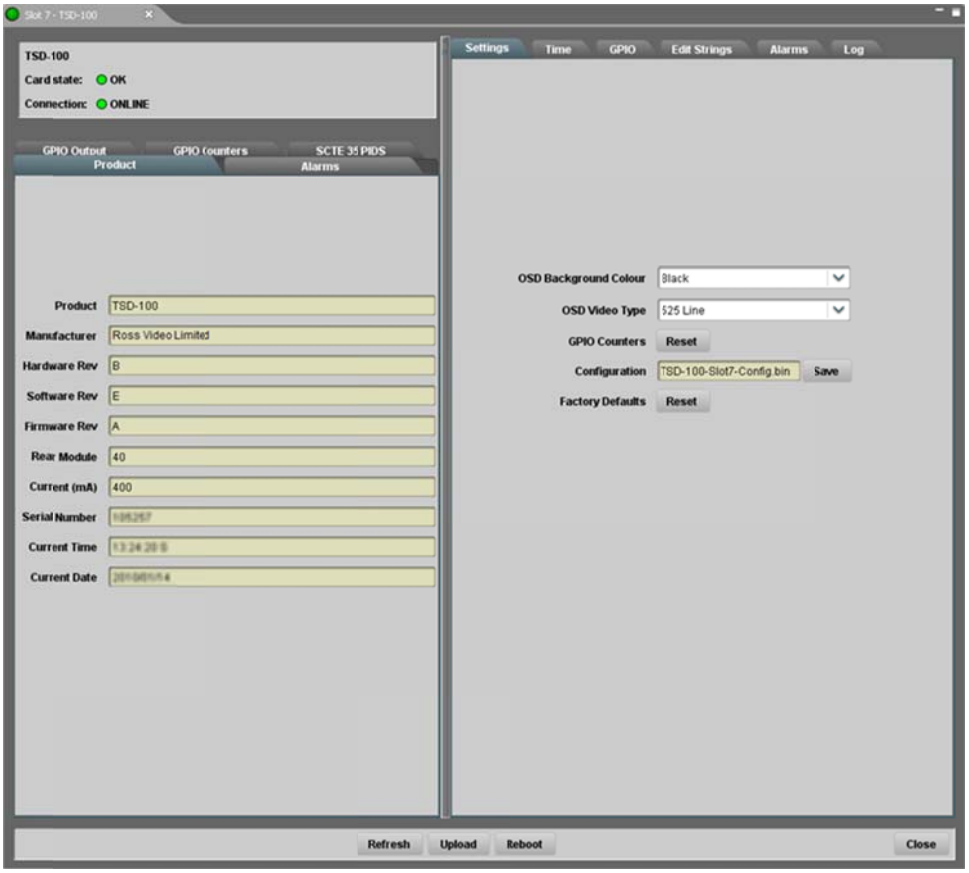
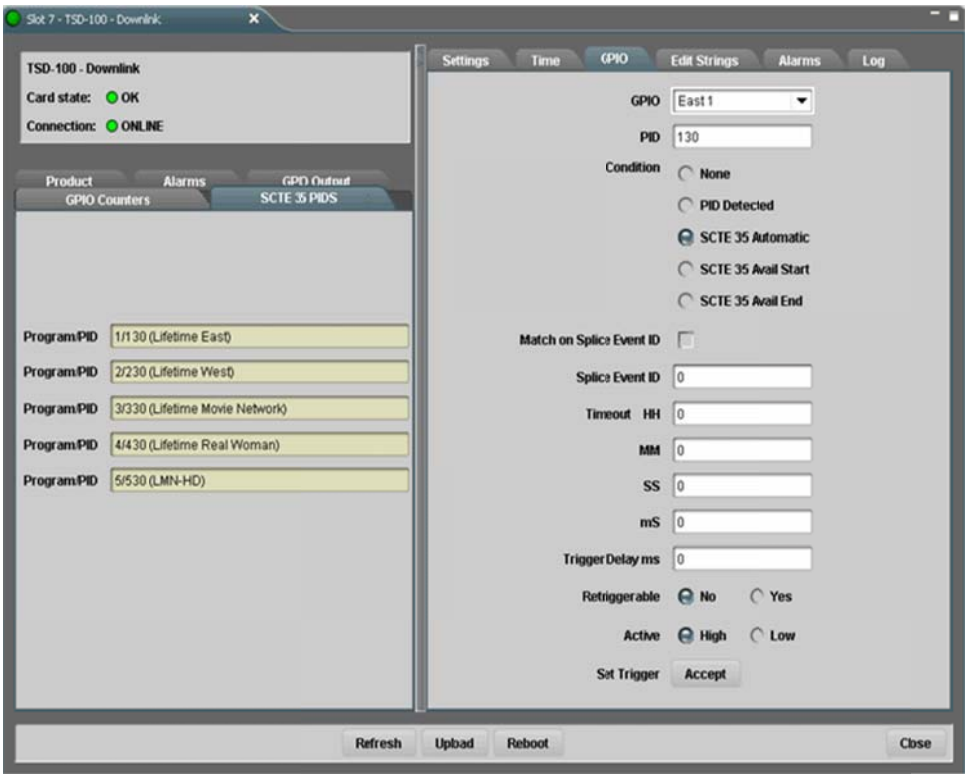


Figure 5. Main** TSD-100 **DashBoard Screen, showing Product Status and Settings

SCTE 35 PIDS

The left side of Figure 6 shows 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, as shown in the example. This list is constantly refreshed from the incoming TS.

The PIDs listed here are the information that you will need to enter in the GPIO menu, as discussed in a later chapter, "**Setting up the TSD-100**". Note that this status screen only shows 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 Trigger Counters display, which is described in the next section.



Trigger Counters

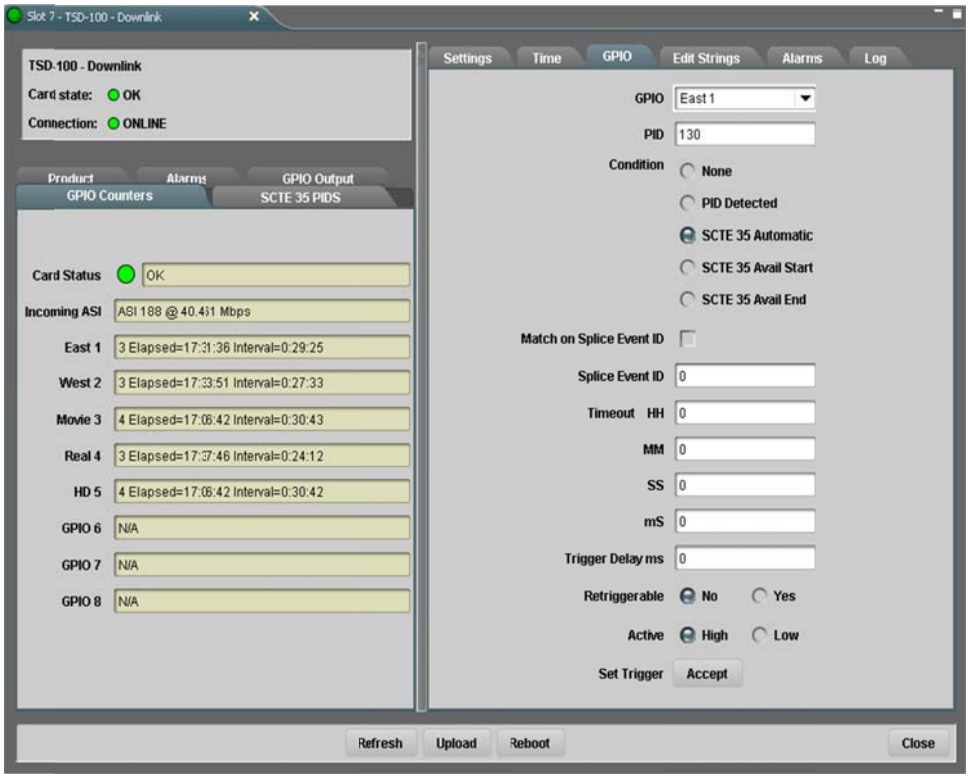
The left side of Figure 7 shows information about occurrences of each of the trigger events that the user has defined.

The leftmost number in these fields is the cumulative number of trigger events that have occurred since the counters were last reset. The **Settings** menu 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 time, if one is displayed, is the last observed **Interval** between triggers.

The chapter, "**Setting up the TSD-100**", describes how to set up the GPIOs to reflect the presence of SCTE-35 triggers or specified PIDs in the ASI input. It also describes how to specify the names of the services associated with these triggers. The names are GPIO 1 through GPIO 8 by default. In the example below, the names were changed, using the **Edit Strings** menu.

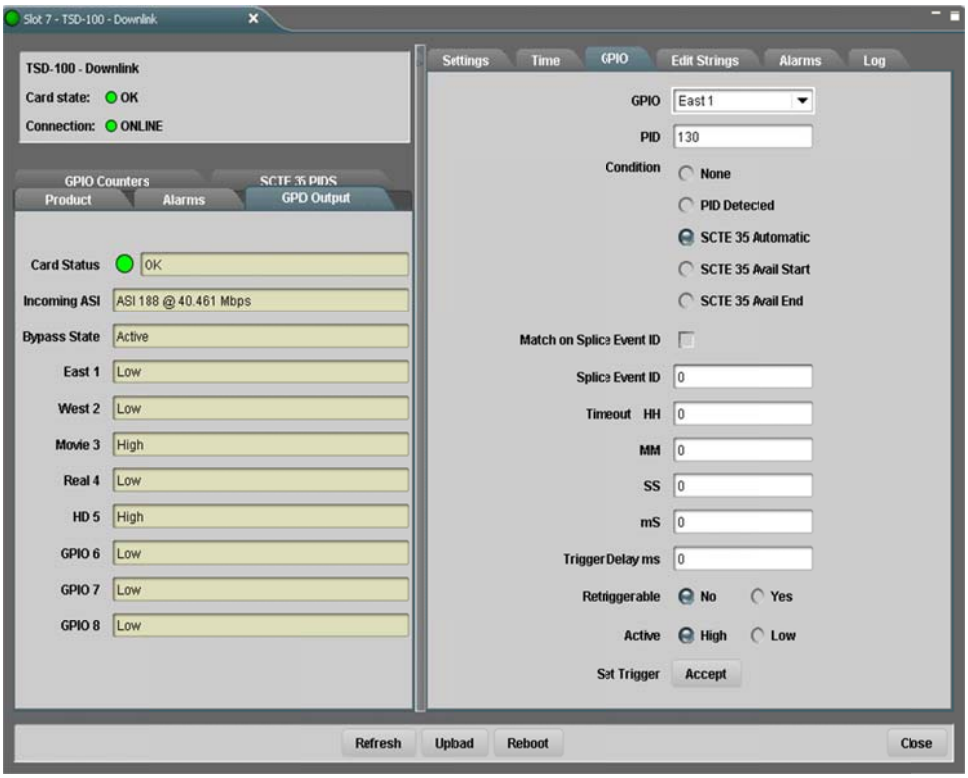


GPIO Output Status

The left side of Figure 8 shows the present state of the eight GPIO outputs, which is obtained by clicking the GPIO Output tab. This displays the video type and bypass state, as well as the present state of each of the eight GPIO outputs.

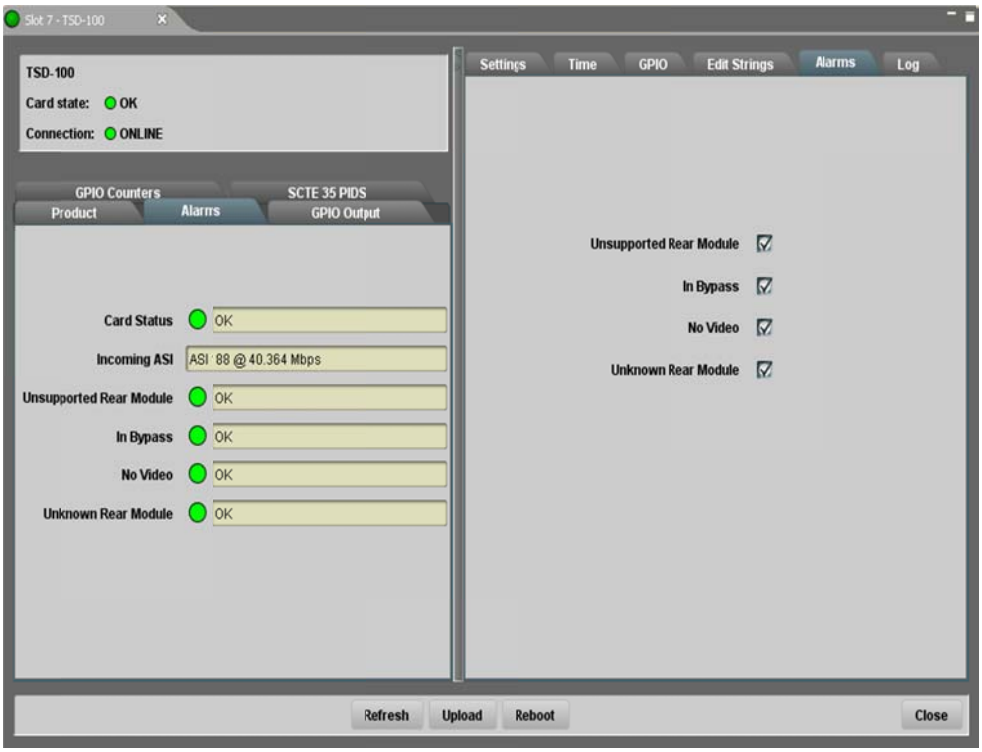
In this case, because the TSD-100 is used with an ONG-MDL-R02 rear module that provides relay contacts, the states are listed as "Open" or "Closed". If the ONG-MDL-R01 rear module were used instead, the states would be listed as "High" or "Low", reflecting the corresponding logic levels.

The chapter, "**Setting up the TSD-100**", describes how to set up the GPIOs to reflect the presence of SCTE-35 triggers or specified PIDs in the ASI input. It also describes how to specify the names of the services associated with these triggers. The names are GPIO 1 through GPIO 8 by default. In the example below, the names were changed, using the **Edit Strings** menu.



Alarm Status

The left side of Figure 9 shows the status of various conditions that can cause an alarm.



The alarm conditions listed in the Alarms status screen are qualified by the selections made on the Alarms setup screen, which is on the right side of Figure 9. Any error conditions that are checked on the Alarms setup screen will cause the Card Status to turn red when they occur. Alarm conditions that are unchecked will be ignored in compiling the Card Status.

Unsupported Rear Module means that the TSD-100 does not work properly with this rear module; for example, it may be missing jacks that are essential for the TSD-100's operation.

In Bypass indicates that the on-board Bypass pushbutton has been activated. This may be an error condition, since it disconnects the TSD-100's ASI input if the rear module provides bypass capability.

No Video means that the ASI input signal is not connected to a valid ASI video source.

Unknown Rear Module means that the TSD-100 does not recognize this rear module and thus may not work properly.

Setting Up the TSD-100

In This Chapter

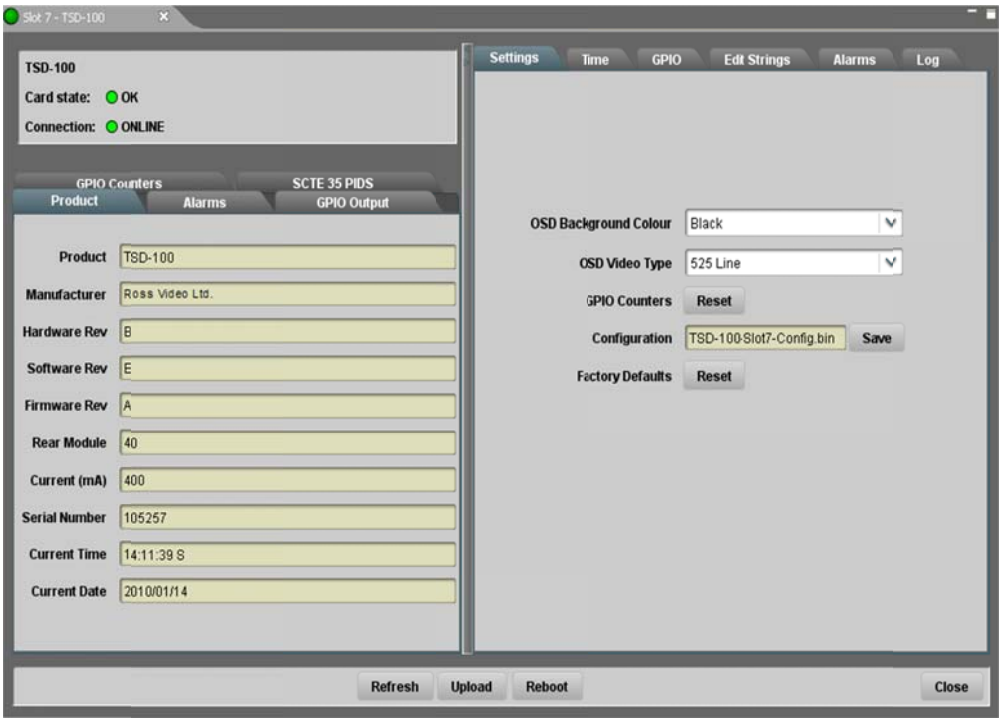
This chapter explains how to use the user interface to set up the TSD-100. This discussion is based on the use of DashBoard through a network connection, however these functions are also available through the local Heads-up Display.

The following topics are discussed:

- General settings
- Defining triggers
- Setting names
- Setting alarm sensitivity
- Examining the event log

General Settings

Figure 10 shows the screen that is displayed by clicking the **Settings** tab.



The **OSD Background Color** and **Video Type** default to black and 525 lines/59.94 Hz, respectively. If you plan to use the on-screen display and need different settings for these, you can select them here; they take effect immediately.

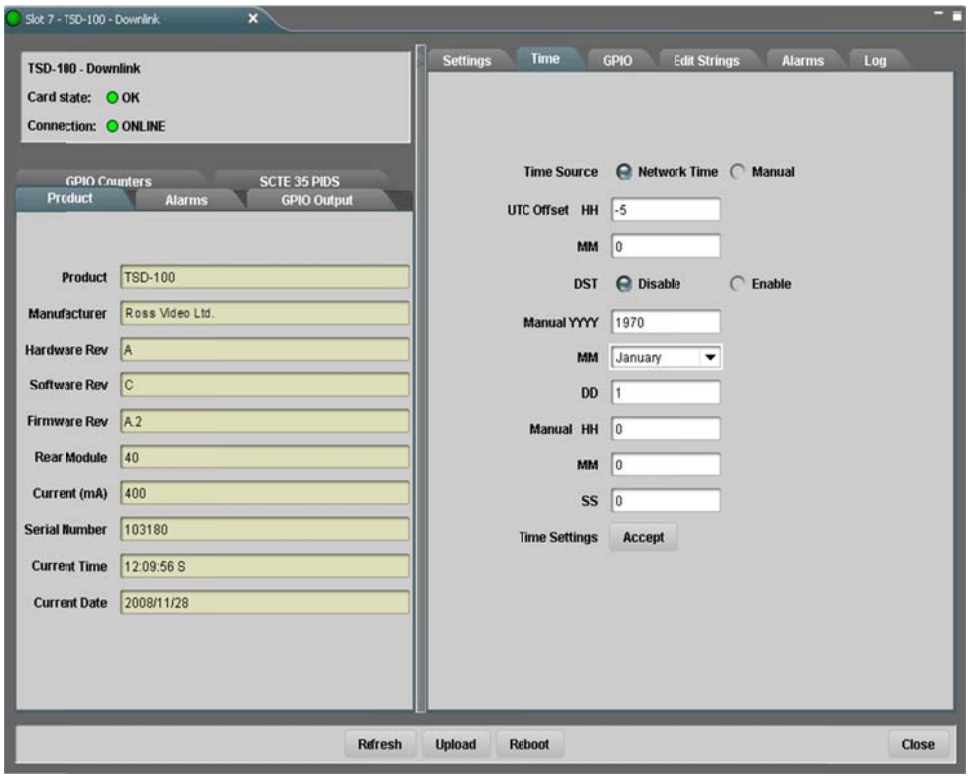
The **GPIO Counters Reset** button clears all trigger counters to 0. Consequently, these counters reflect the number of triggers of each type that have occurred since the last time you clicked this button, or since power-on.

The **Save Configuration** button permits you to download the current configuration to a file on your computer. Use the **Upload** button to restore this card to the same settings or to clone the settings to other cards running the same software version.

The **Factory Defaults 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.

Time Settings

Figure 11 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 Source can 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. See the section "**Configuring the frame for network time**". 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.

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 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 YYYY/MM/ DD and **Manual Time HH:MM:SS** 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 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**.

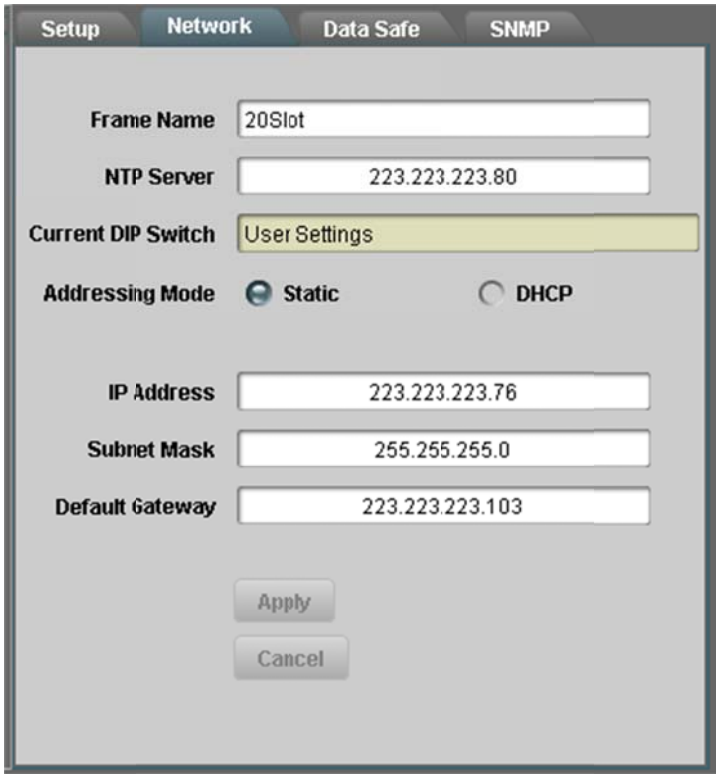


Figure 12. NTP Setup Menu

Defining Triggers

Figure 13 shows the screen that is displayed by clicking the **GPIO** tab.

This menu allows you to define the parameters for reporting the presence of individual PIDs in the ASI input. For each of the 8 GPIO outputs, which you select using the **GPIO** selector, you will need to specify the following:

- **PID** value, in the range 0-8191 decimal;
- **Condition**, which is one of the following: **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. If the “out-of-network-indicator” is 1 and the 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**, 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 ms** 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**: Yes or No. 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**: When the TSD-100 is used with the ONG-MDL-R02 rear module, this specifies the state of the relay contacts (**Closed** or **Open**) when the GPIO is asserted. When using the ONG-MDL-R01 rear module, this specifies the logic level (**High** or **Low**) present at the GPIO output when it is asserted; **High** is approximately 3.3 volts, and **Low** is approximately 0 volt.

Figure 13 illustrates a typical way of using these settings. There will be a contact closure on GPIO 1 for the duration of each SCTE-35 trigger on PID 130.

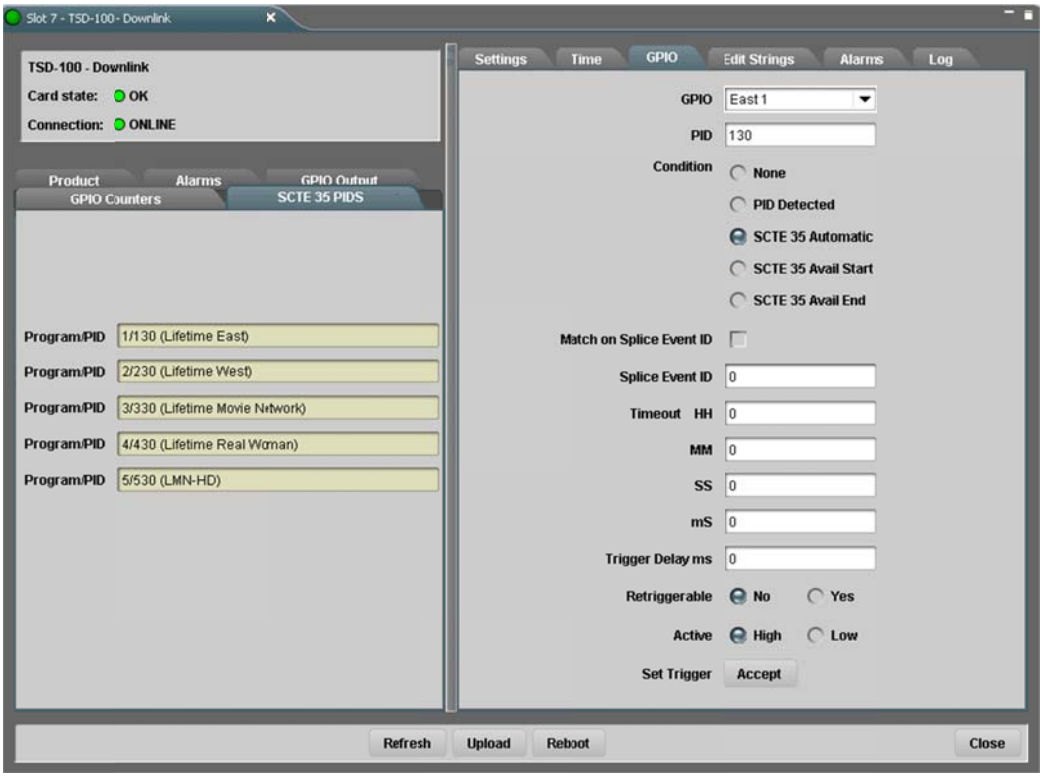


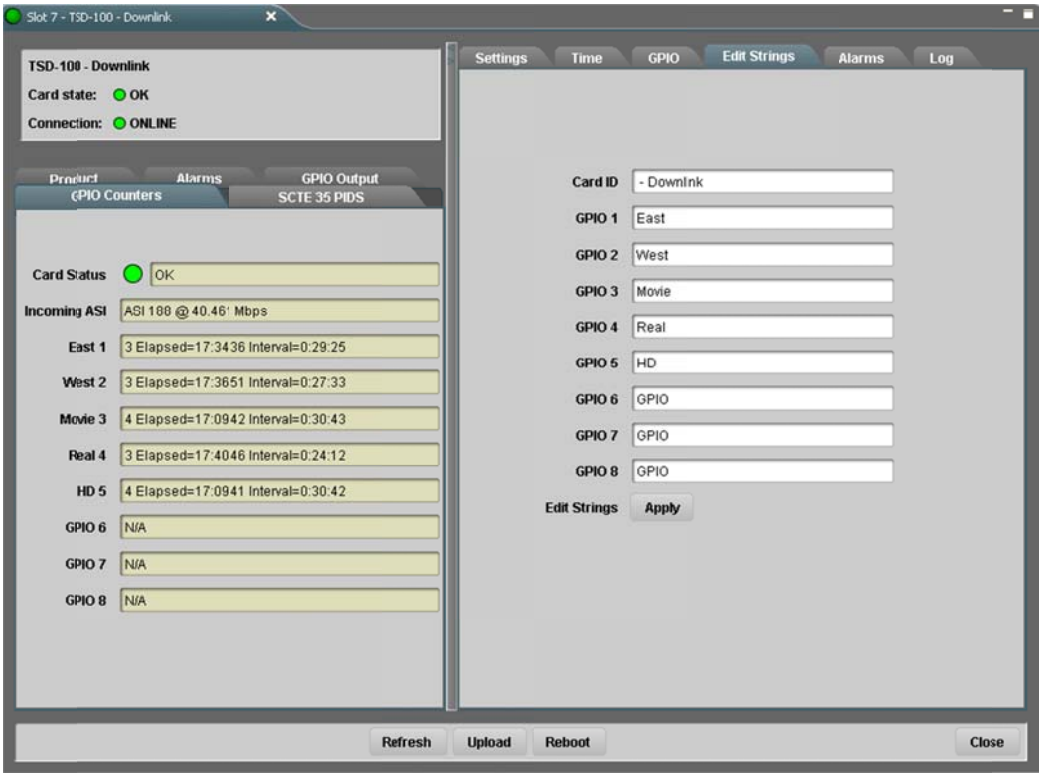
Figure 13. GPIO menu, showing settings for SCTE-35 trigger presence detection

Setting Names

The following screen is obtained by clicking the **Edit Strings** tab. This 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**.

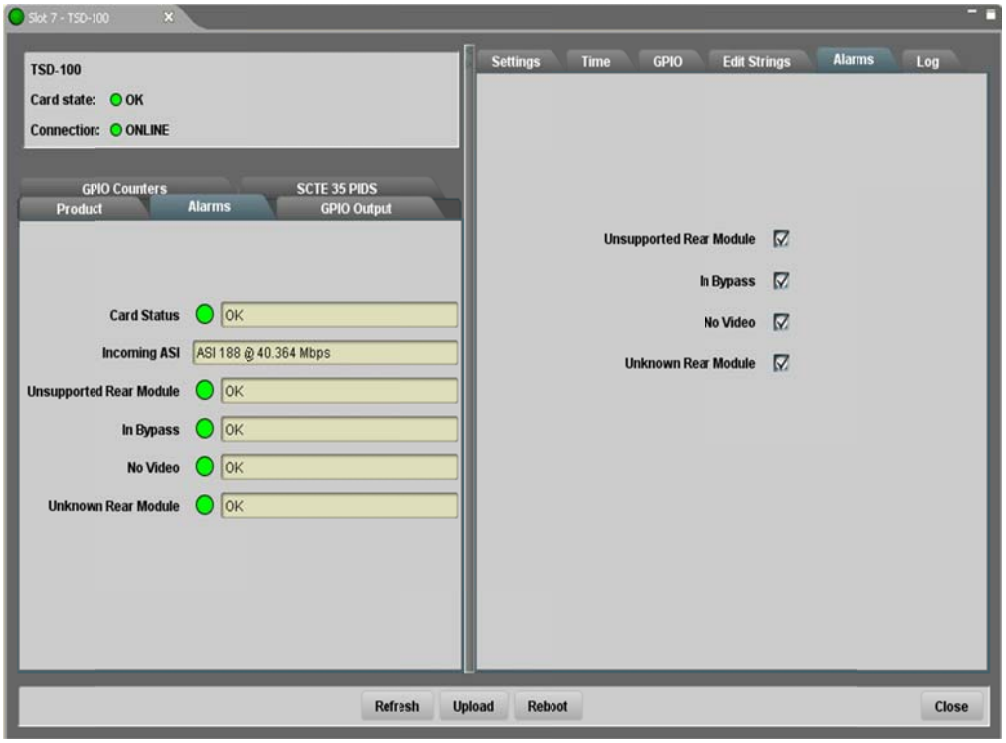
If you enter a **Card ID** and press **Apply** then **Yes**, the new module name will be "TSD-100" followed by the string you typed in (“TSD-100 – Downlink” in this example). Since this changes the name of the module, its previous name disappears from the device list in the Basic Tree View and the new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



Setting Alarm Sensitivity

The following screen is obtained by clicking the Alarms tab. This 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.



Unsupported Rear Module means that the TSD-100 is plugged into an incompatible rear module, which prevents it from operating correctly.

No Video means that no recognizable signal is detected on the ASI input. When using a rear module such as the ONG-MDL-R01 that supports video bypass, this will also be true when the Bypass pushbutton is in the ***out*** position.

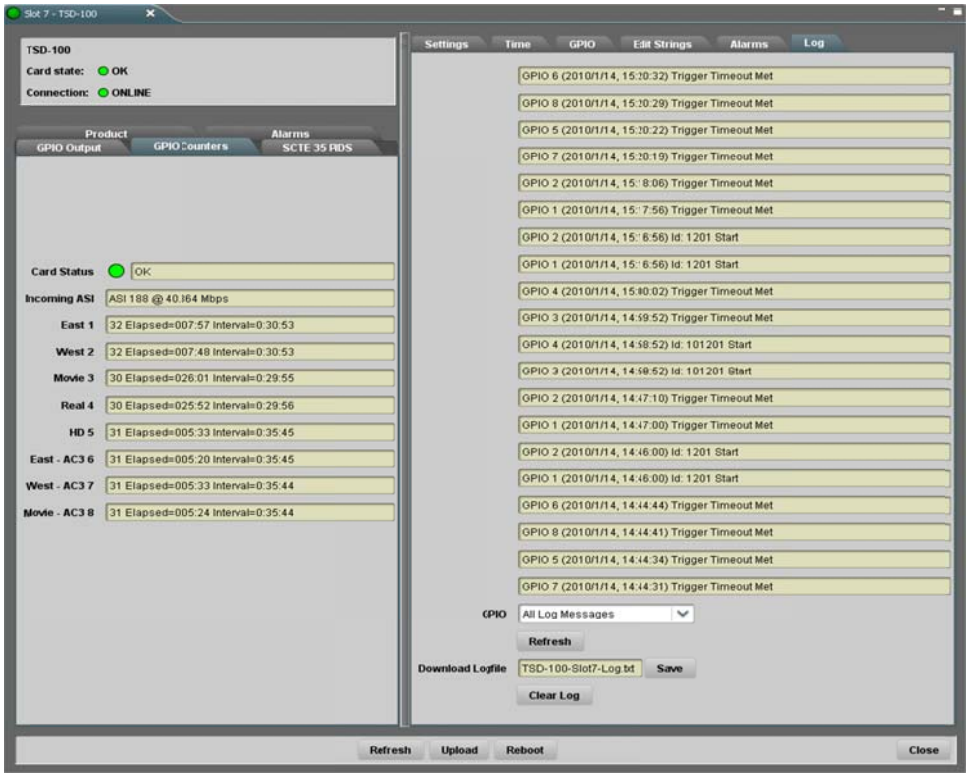
Unknown Rear Module means that the TSD-100 is plugged into a rear module that it does not recognize. This means that it may not operate correctly, depending on the connectors and features of the unknown rear module.

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 Figure 16. Each entry includes the GPIO number, date and time, Splice Event ID, and type of event. Example: "GPIO 1 (2008/11/28, 16:13:38) Id:1201 End".

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 page 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.



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 TSD-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.

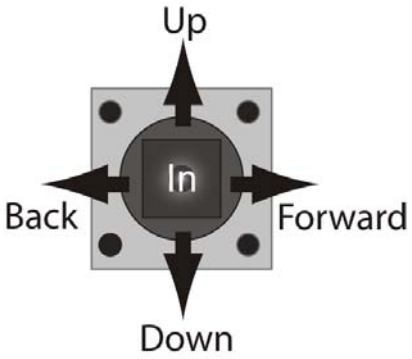
The following topics are discussed:

- Layout and Navigation
- Using the Menus

Layout and Navigation

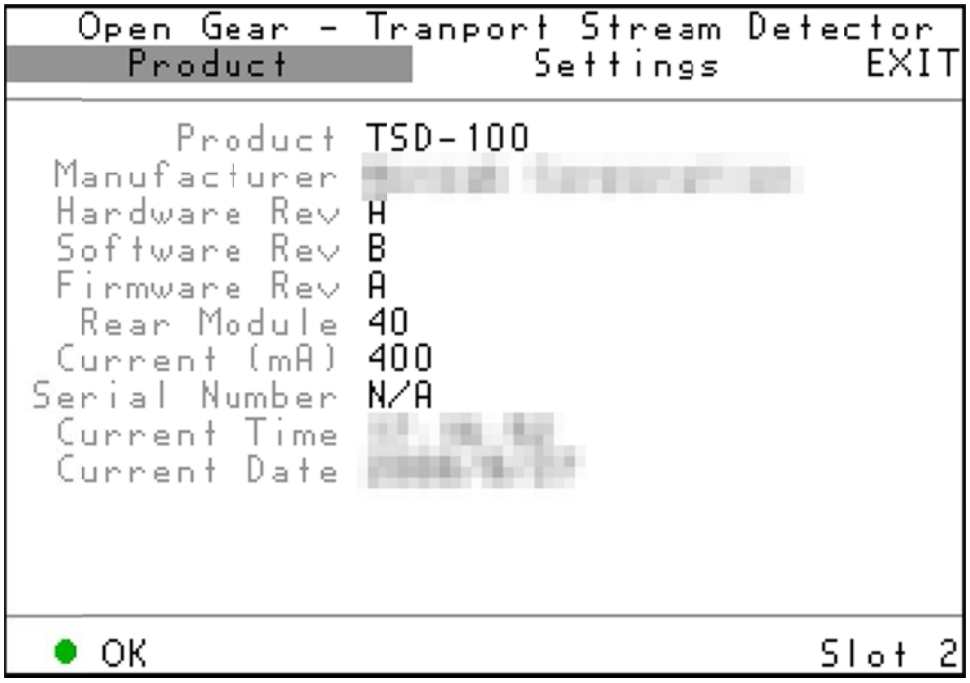
The **Menu Switch** is a five-direction square finger joystick located near the front edge of the TSD-100 card. With the card edge facing you, use the following menu switch actions to navigate the menu and configure parameters:

- **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. While editing an alphanumeric value, press once to move to the next character to the right.
- **Back** — Press once to move across columns from right to left. While editing an alphanumeric value, press once to move to the previous character to the left.



When the TSD-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 **GPIO** Status screen, ***Down*** a second time for **Trigger** Status, and so on. These are the same Status screens described in the DashBoard setup 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 **Trigger** menu, a second time for **Alarm**, 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.



Using the Menus

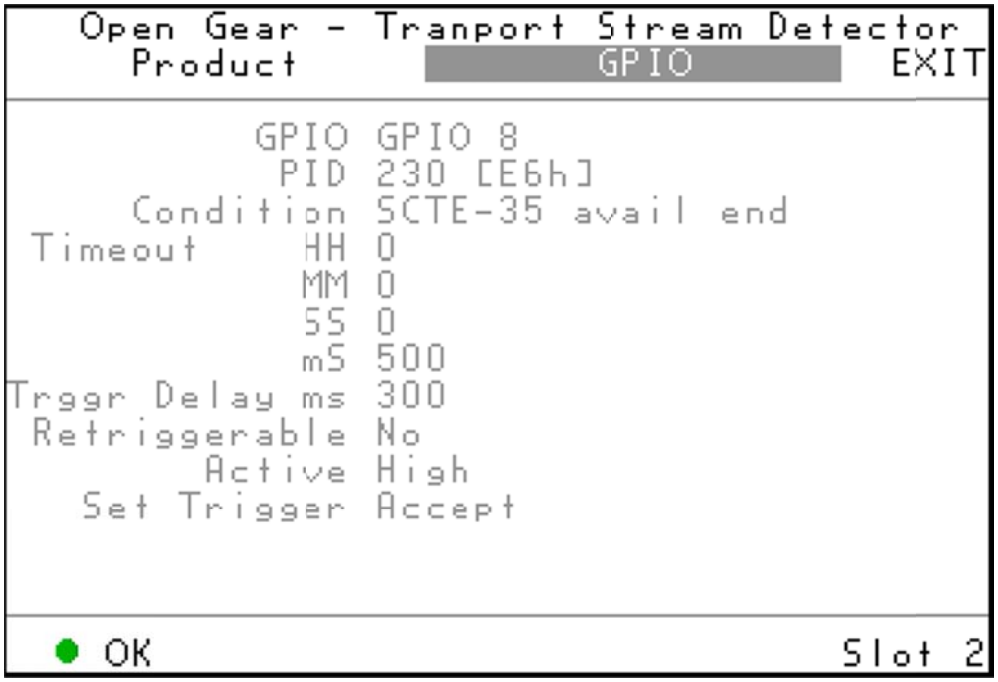
The available screens that can be selected are:

Status (left column)	Setup menus (center column)	Exit (right)
Product	Settings	Exit
GPIO Output	GPIO	
Trigger Status	Edit Strings	
SCTE 35 PIDS	Alarms	
Alarms	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 (for example, **Settings**) is highlighted (brighter than other text), skip to step 3. If it is not highlighted, press the Menu Switch ***In*** to highlight it.
3. Press the Menu Switch ***Down*** or ***Up*** to step through the available menus.
4. When you reach **GPIO**, select it by pressing the Menu Switch ***In***. The display should be similar to the one shown below.
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 **Trigger GPIO** 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 (**GPIO 8** in this example), select it by pressing the Menu Switch ***In***.
9. Repeat steps 5-8 to select values for the parameters that are associated with GPIO 3. While editing the numeric fields, such as PID, note that ***Forward*** and ***Back*** allow you to select individual digits, while ***Up*** and ***Down*** change the value of the selected digit. Numeric entry is completed by pressing the Menu Switch ***In***. This also applies to editing alphanumeric values in the Edit Strings menu.
10. When you have finished setting the parameter values, move the highlight to the word **Accept** and press the Menu Switch ***In*** to put into effect the changes you've made.
11. To switch to a different menu, press the **Menu Switch *Up*** or ***Down*** repeatedly until the selection bar moves to the title. Press the **Menu Switch *In*** and return to step 3.



Specifications

In This Chapter

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

Table 3. TSD-100 - Technical Specifications

Category	Parameter	Specification
Serial Digital Video Inputs	Number Of Inputs	1 input
	Input Signal Standard Accommodated	DVB-ASI (EN 50083-9)
	Impedance	75Ω terminating in Active mode Loop-through to SDI Output in Bypass mode, via the ONG-MDL-R01, R21 or R23 rear module.
	Equalization	Over 100 m of Belden 1694A cable
	Return Loss	>15dB to 270 MHz
Serial Digital Video Outputs	Number of Outputs	1 ASI input monitor 1 on-screen display (OSD) SMPTE 259 SDI output (available with ONG-MDL-R01 or R21 rear module)
	Impedance	75Ω
	Return Loss	>10dB to 270 MHz
	Signal Level	800mV ±10%
	DC Offset	0 Volts ±50 mV
	Rise & Fall Time (20-80%)	700ps. typical
	Overshoot	<8%
Analog video Output	Number of outputs	1 on-screen display (OSD) output
	Impedance	75Ω
	Signal level	1.0 v
	Formats	NTSC-M or PAL-B/G
GPIO Outputs	Number and type of outputs	With ONG-MDL-R02 or R22 rear module: 8 pairs of isolated contacts. (Max 0.1A)
		With ONG-MDL-R01, R21 or R23 rear module: 8 logic outputs (3.3v) and 2 or 4 ground connections.
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 TSD-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 Technical Support specialist to perform a complete software reload on the TSD-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 received within 60 seconds, the card will attempt to restart with the last operational software load.

Software loads can be sent to the TSD-100 from DashBoard, using a MFC-8300 Series Network Frame Controller card.

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 User Manual provides all pertinent information for the safe installation and operation of your TSD-100. 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 module will be made available at a nominal charge. Any shipping costs incurred will be the responsibility of you, the customer. All products shipped to you from Ross Video Limited will be shipped collect.

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

Contact Us

Contact our friendly and professional support representatives for the following:

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

PHONE	**General Business Office and Technical Support**	613 • 652 • 4886
	Fax	613 • 349 • 0006
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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Ross Part Number: TSD100DR-004-02