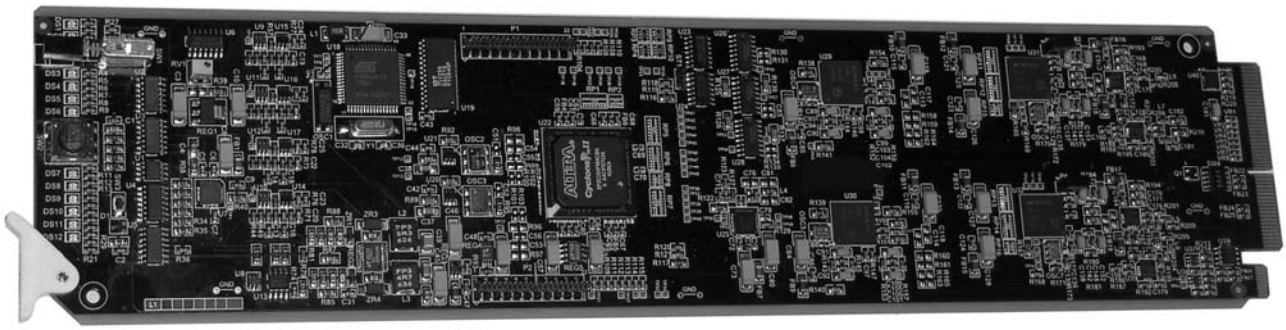
Ross Video Limited

TSI-100

Transport Stream Identifier

User Manual



Live Production Technology

openGear

Product Name: TSI-100

TSI-100 • Transport Stream Identifier User Manual

- Ross Part Number: **TSI100DR-004-02**
- Release Date: September 23, 2010. Printed in Canada.

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Important Regulatory and Safety Notices

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

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

Symbol Meanings

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

Warning

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

Caution

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

Notice

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

ESD Susceptibility

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

Important Safety Instructions

Caution

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

Warning

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

Warning

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

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

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

Only use attachments/accessories specified by the manufacturer.

EMC Notices

US FCC Part 15

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

Notice

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

CANADA

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

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

EUROPE

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

INTERNATIONAL

This equipment has been tested to **CISPR 22:1997** along with amendments **A1:2000** and **A2:2002** and found to comply with the limits for a Class A Digital device.

Notice

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

Maintenance/User Serviceable Parts

Routine maintenance to this openGear product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual.

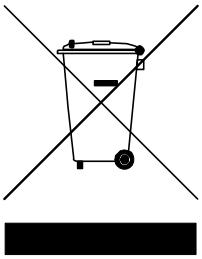
Environmental Information

The TSI-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 TSI-100 Transport Stream Identifier. The TSI-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 TSI-100 fits into your overall working environment. Equally pleasing is the product quality, reliability and functionality. Thank you for joining the group of worldwide satisfied Ross Video customers!

Should you have a question pertaining to the installation or operation of your TSI-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 TSI-100 extracts the Transport Stream Identifier(TSID) from an ATSC ASI transport stream and closes GPIO contacts when the value doesn't match a user supplied value. This makes it an ideal device for signaling a modulator that a transport stream is present and is for the correct television channel. As a member of the openGear family:

- The TSI-100 shares a common control interface, known as DashBoard, with a broad array of other products.
- The TSI-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 TSI-100 ideal solution for detecting a change in a transport stream source:

- User settable 'must match" TSID
- Adjustable triggering on the detection of an incorrect TSID.
- Adjustable triggering on the loss of the transport stream.
- Frame-accurate triggering: each trigger is delivered within one video frame time.
- Video bypass capability with ONG-MDL-R01, R21 or R23 rear module.
- Fits openGear DFR-8300 series frames.
- Compatible with the openGear frame's SNMP option, allowing monitoring with third-party SNMP software systems. For more information, contact Ross Technical Support.
- On screen display for setup so that no LAN or PC is required.

Functional Block Diagrams

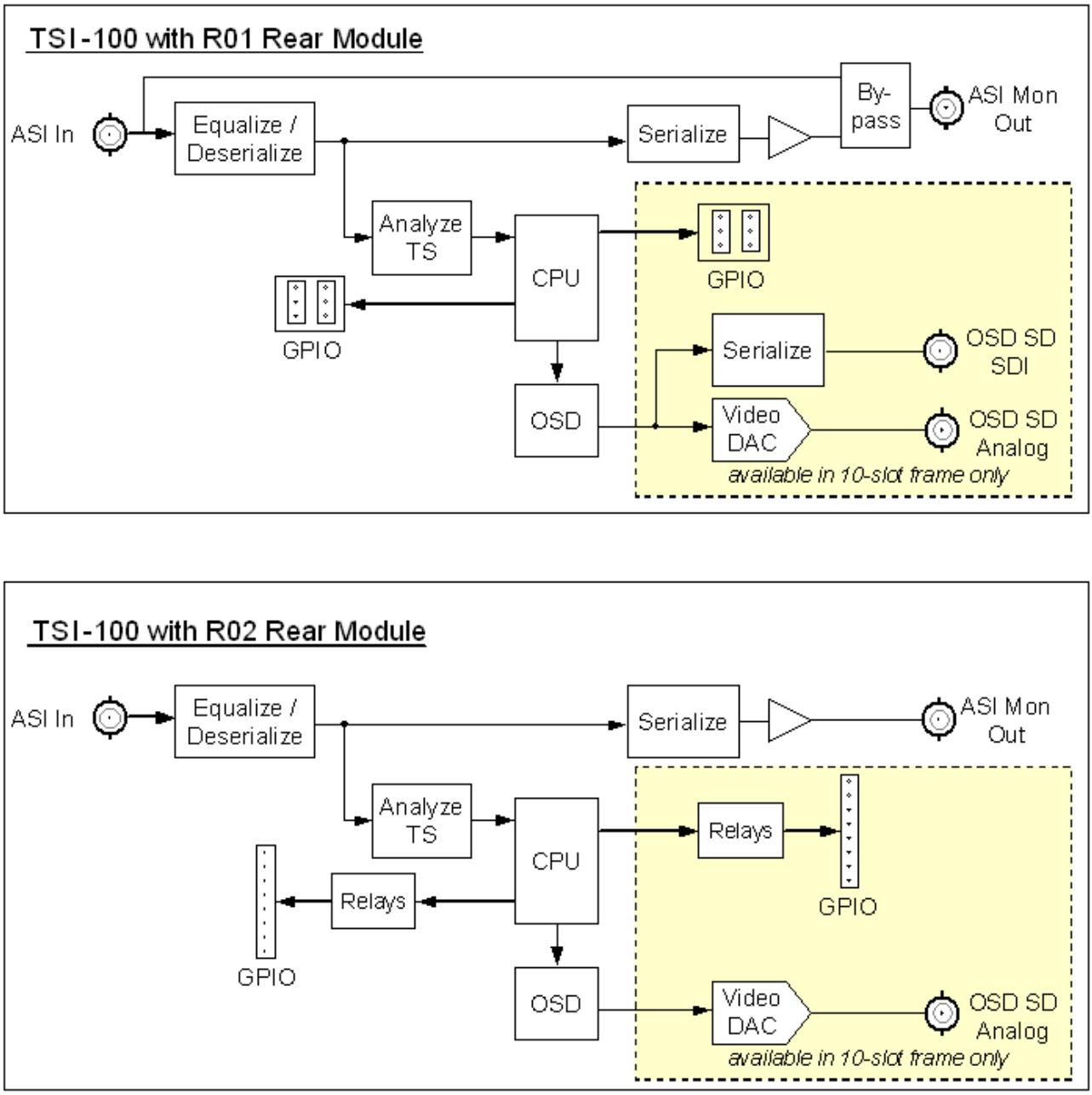


Figure 1. Simplified Block Diagrams of TSI-100 Functions

Documentation Terms

The following terms are used throughout this guide:

- "**Frame**" refers to the frame that houses the **TSI-100** card.
- "**Operator**" and "**User**" refer to the person who uses the **TSI-100**.
- "**Board**" and "**Card**" refer to the **TSI-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 **TSI-100** operates.
- "**Rear Module**" refers to the connector module at the rear of the frame, into which the **TSI-100** is inserted.
- "**GPIO**" means General Purpose Input-Output. This term is commonly used in the broadcast industry to refer to DC signals used by one device to control another.

Frame and Rear Module Compatibility

The TSI-100 can operate with the following frame and rear modules combinations.

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

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

Quick Start

Assuming you have a openGear frame, an **ONG-TSI-100** card and a suitable rear module, the following steps will allow you to start matching transport stream identifiers:

1. Connect the frame to your LAN, using the instruction sheet "Connecting the openGear Frame to a Network", supplied with the frame.
2. Install DashBoard on a computer connected to the LAN. The DashBoard Control System™ software and user manual are available from the Ross Video website.
3. Install a rear modules in the frame, as described in the section "**Rear Module Installation**" of this manual.
4. Install a TSI-100 into the rear modules, as described in the section "**Board Installation**" of this manual.
5. Connect a video signal to the SDI input jack on the rear module of the TSI-100 as described in the section "**Cable Connections**" of this manual.
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 TSI-100 to be used to encode.
7. Click the **TSID Setup** tab and enter the 4 digit TSID you with to match on.
8. Under the same tab set a value for **Wrong TSID Count**. This value is the number invalid TSIDs are needed to trigger a change in the GPIO state.
9. Under the same tab set a value for **No TSID Timeout**. This value is the amount of time without a TSID before triggering a change in GPIO state.
10. Connect the GPIO 1 or GPIO2 output of the TSI-100 to the device you wish to trigger. GPIO1will be low and GPIO2 will be high when the transport stream is present and the TSID is correct.

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

Rear Module Installation

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

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

1. Refer to the ***DFR-8300 Series Frames User Manual*** to ensure that the frame is properly installed according to instructions.
2. On the rear of the frame, locate the card frame slot.
3. Remove the Blocker Plate (if any) from the rear of the slot you have chosen for the TSI-100 installation. Retain the plate for possible future use.
4. Seat the bottom of the rear module in the seating slot at the base of the frame's back plane.

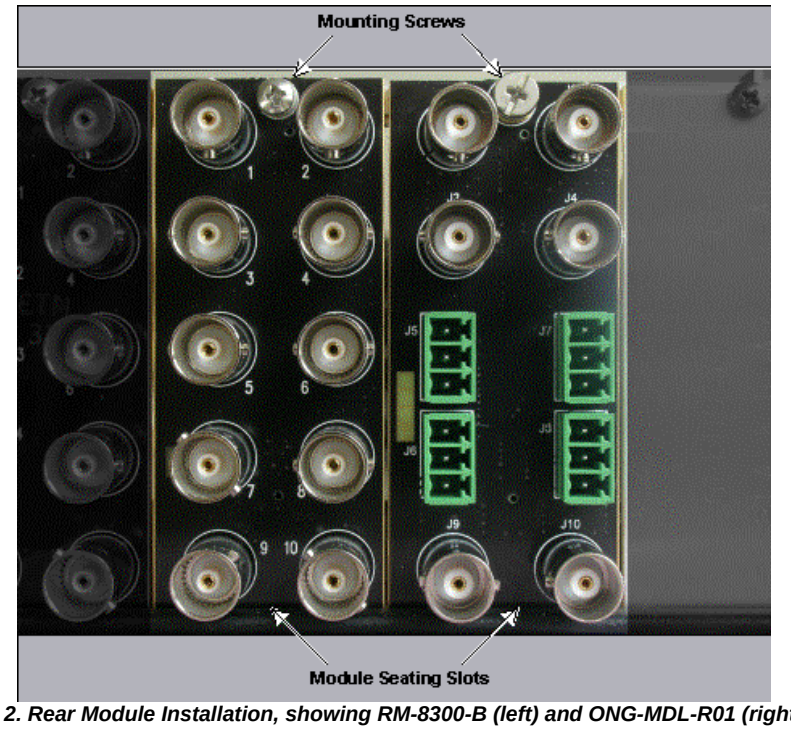


Figure 2. Rear Module Installation, showing RM-8300-B (left) and ONG-MDL-R01 (right) modules

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

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

Note — *Video bypass is available with the ONG-MDL-R01,R21 and R23 rear modules. A monitor output is available with the ONG-MDL-R02 and R22 modules.*
Rear modules ONG-MDL-R02 and R22 have isolated GPIO outputs and ONG-MDL-R01,R21 and R23 produce 0-3.3V logic levels.

Board Installation

Use the following procedure to install the TSI-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 TSI-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 TSI-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 TSI-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 modules on the frame backplane. Connect the input and output cables according to the following diagram. It is not necessary to terminate unused outputs. Note that the BNCs are numbered 1-10 by convention, even though some may not be installed. The upper left BNC is #1, with the other odd-numbered jacks 3-9 below it. The even-numbered BNC jacks 2-10 are in the right column. For example, the ONG-MDL-R01 rear module shown in the following illustration has 1-4 and 9-10.

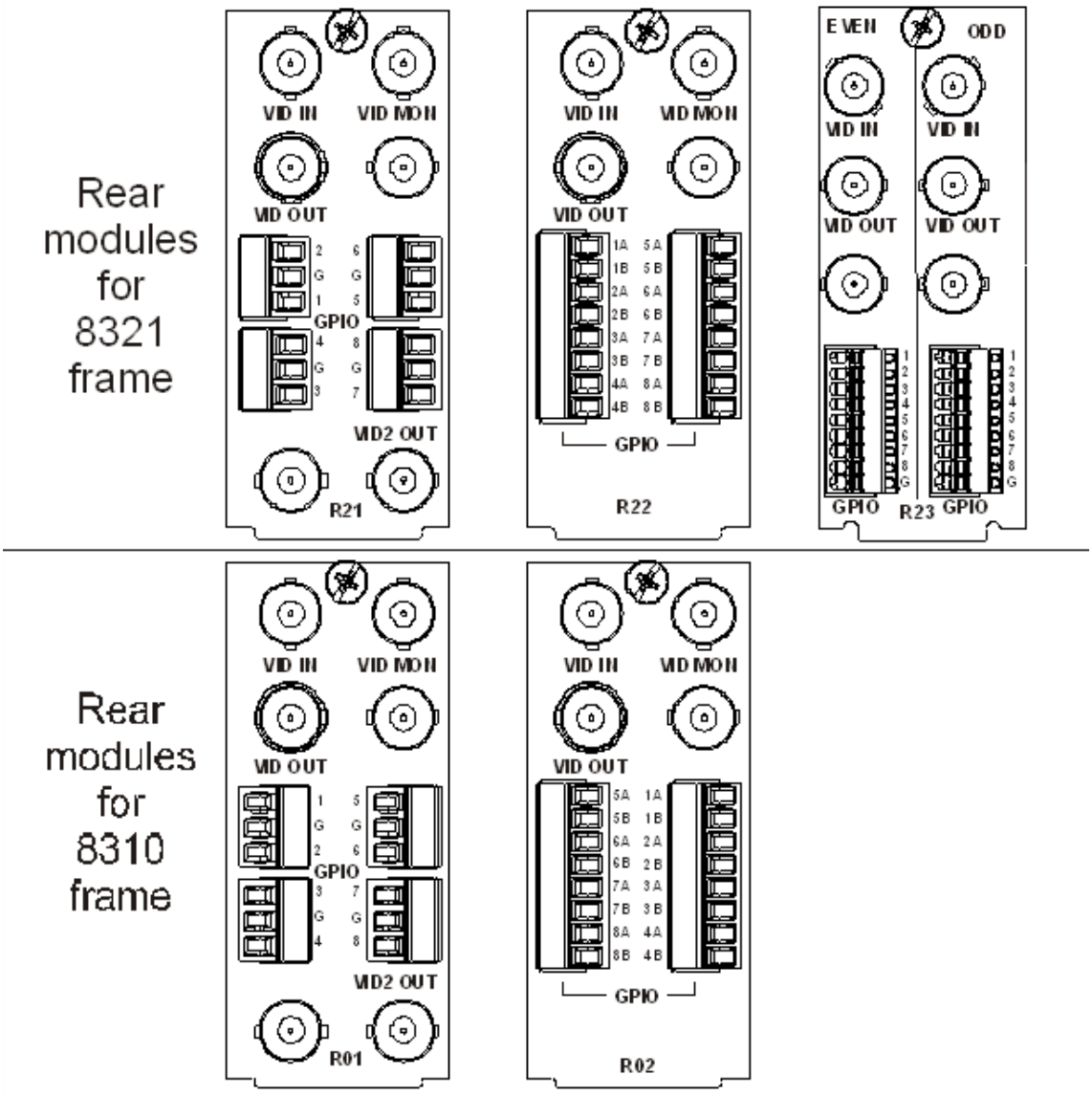


Figure 3. Jack Designations for the TSI-100 with Suitable Rear Modules

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

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

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

This jack carries a reclocked copy of the ASI signal applied to BNC1. When the TSI-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 TSI-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 TSI-100's Menu Switch.

User Controls

In This Chapter

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

- Switches
- LEDs

User Controls

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

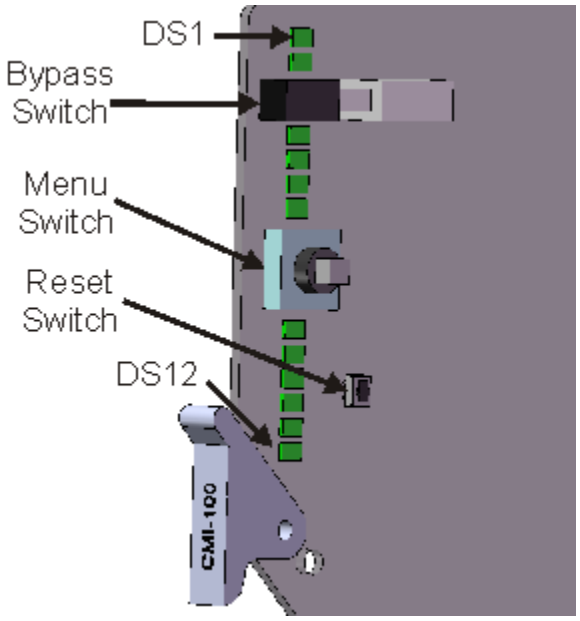


Figure 4. Card-edge User Controls

Bypass Switch

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

Menu Switch

The recommended user interface for the TSI-100 is the DashBoard program, running on a computer connected to the openGear frame through an Ethernet connection. If your frame does not have the LAN option, or you do not have access to a computer with DashBoard, you can use the on-screen display (OSD) in conjunction with the **Menu Switch**. This requires either an SDI or analog monitor (NSTC or PAL) to be connected to the TSI-100 card. The **Menu Switch** is a five-direction square finger joystick located near the front edge of the TSI-100 card.

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

Reset Switch

This button is used for rebooting the card.

LEDs

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

Table 1. Selection and Status LED Descriptions

LED	Color	Location	Display and Description
Power	Red/ Green/ Orange	DS1	When off, there is no power. When lit and green the card is running with valid input. When flashing green, the boot loader is waiting for software upload. When lit orange, this is a warning about a signal or configuration error. When lit red, the card is not operational. This will occur if, for example, there is no video input.
Bypass	Red	DS2	When off, TSI-100 is in the video path. When lit red, the TSI-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 TSI-100 is not supported by the software. Operation will not be correct.
Bypass	Red/ Green	DS8	Normally lit green. When lit red, the TSI-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 TSI-100 is not recognized by the software. Operation may not be correct.

DashBoard and TSI-100 Status

In This Chapter

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

The following topics are discussed in this chapter:

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

Layout and Navigation

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

Selecting a TSI-100 Module

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

Screen layout

The TSI-100 window is divided into four sections as shown:

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

Product Status

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

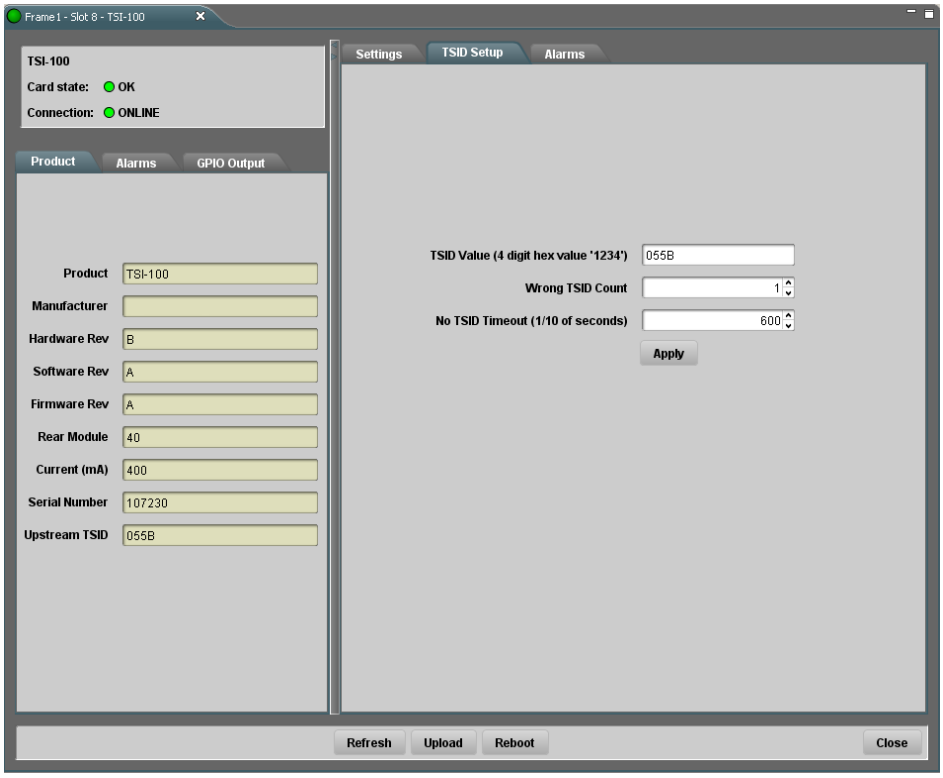


Figure 5. Main TSI-100 DashBoard Screen, showing Product Status and Settings

GPIO Status

Figure 6 shows the status of the GPIO outputs. The TSI-100 controls 2 GPIOs: output GPIO1 it active high (GPIO1 is high when the TSID does not match or no transport stream is present) and GPIO2 is active low.

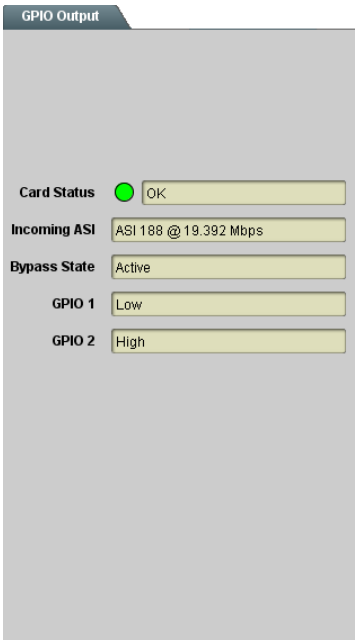


Figure 6. GPIO Output screen

Alarms

Figure 7 shows the status of the TSI-100 Alarms.

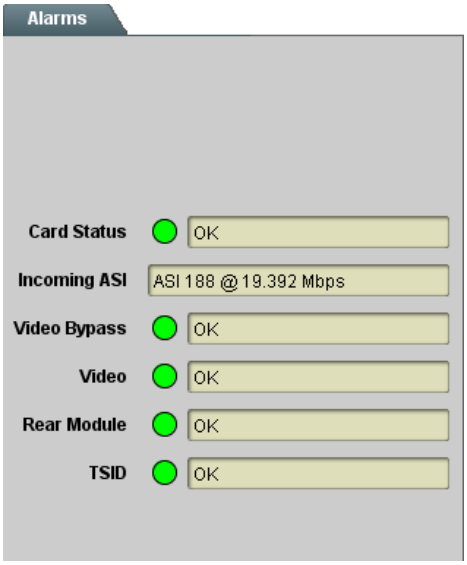


Figure 7. Alarms

Setting Up the TSI-100

In This Chapter

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

The following topics are discussed:

- General Settings
- TSID Setup
- Alarms

Settings

Figure 8 shows the screen that is displayed by clicking the **Settings** tab.

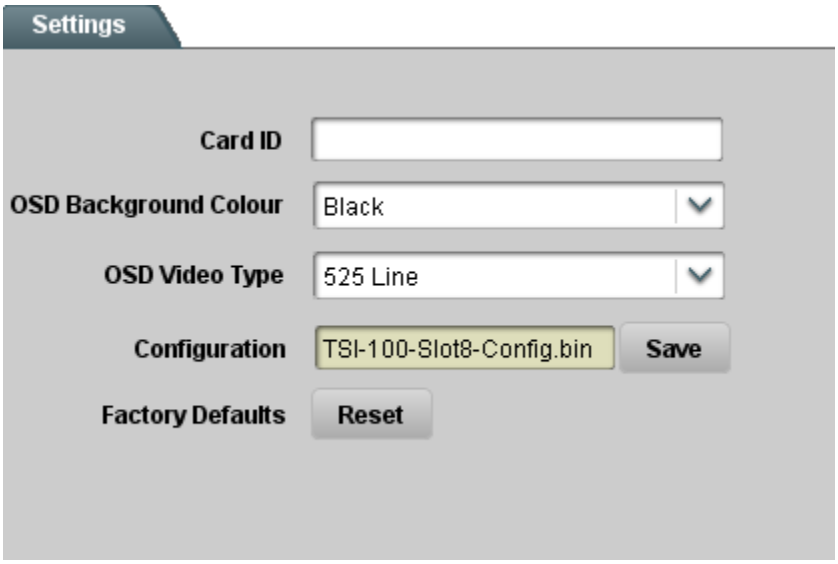


Figure 8. Settings Menu

The **Card ID** field allows you to assign a unique name to a TSI-100 card. This is especially useful if you have more than one TSI-100 in a frame. If this field were blank, the name would just be "TSI-100".

The **OSD Background Colour** sets the background color for the OSD.

The **OSD Video Type** sets video mode of the OSD to either 525 line or 625 line.

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

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

TSID Setup

Figure 9 shows the screen that is displayed by clicking the **TSID Setup** tab.

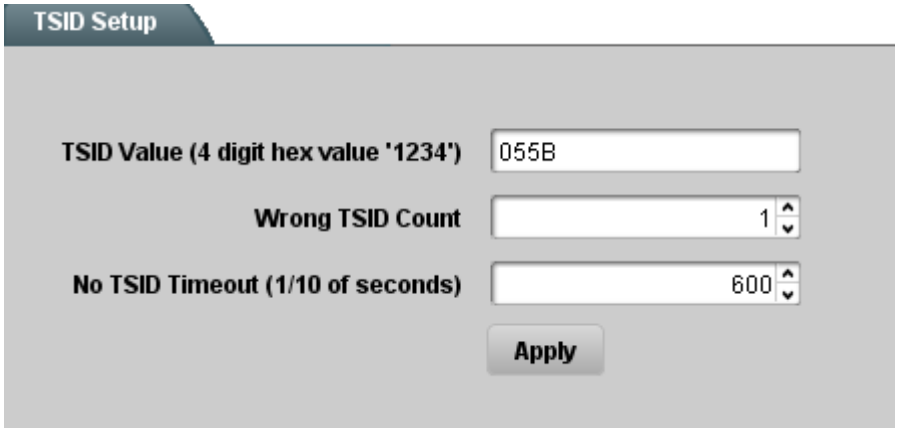


Figure 9. TSID Setup

The **TSID Value** is a 4 digit hex value the user sets. If the incoming signal contains a TSID that doesn't match this value the GPIOs become active.

The **Wrong TSID Count** value sets the number of consecutive invalid TSIDs to process before activating the GPIOs.

The **No TSID Timeout** value sets the amount of time, in $1/10^{th}$ of a second, to wait with no incoming TSID before activating the GPIOs.

Alarms

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

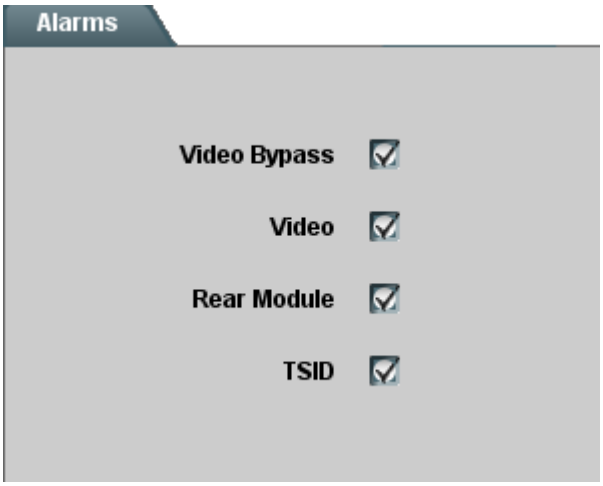


Figure 10. Alarm Setup

The TSI-100 has several alarms that can affect the overall status of the card. If you wish to disable an individual alarm uncheck the corresponding checkbox.

A Note on GPIOs

The TSI-100 has two active GPIOs. GPIO1is active high and GPIO 2 is active low.

About GPIO Polarities

An active GPIO output produces a 3.3V level on a NG-MDL-R01, R21 and R23 rear module and a switch closure on the ONG-MDL-R02 and R22 modules.

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 TSI-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 TSI-100 card.

With the card edge facing you, use the following menu switch actions to navigate the menu and configure parameters:

- **In** —Press once to enter a value or select a menu or item.
- **Up** — Press once to move to the menu, item, or value above the current selection.
- **Down** — Press once to move to the menu, item, or value below the current selection.
- **Forward** — Press once to move across columns from left to right.
- **Back** — Press once to move across columns from right to left.

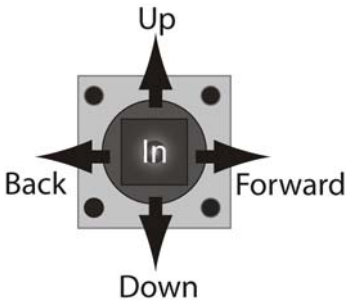


Figure 11. Menu Switch

When the TSI-100 is first powered on, the menu shown below is displayed on the OSD output. The top line of the screen has three items:

- The leftmost item, **Product**, is the first in a list of Status screens. To view these screens, press the Menu Switch ***In*** to highlight the word **Product**, then press the Menu Switch ***Down*** once to view the **Alarms** status screen, ***Down*** a second time for **Captured**, and so on. These are the same Status screens described in the DashBoard Status chapter.
- The second item, **Settings**, is the first in a list of Setup menus. To view these, press the Menu Switch ***Forward*** to advance the selection bar to the word **Settings**, then press the Menu Switch ***In*** to highlight it. Now press the Menu Switch ***Down*** once to view the **Alarms** menu, a second time for **Capture**, and so on. These are the same Setup menus described in the DashBoard Setup chapter.
- The third item is **Exit**. To turn off the OSD, press the Menu Switch ***Forward*** to advance the selection bar to the word **Exit**, then press the Menu Switch ***In***. To turn the OSD back on, press the Menu Switch ***In*** again.

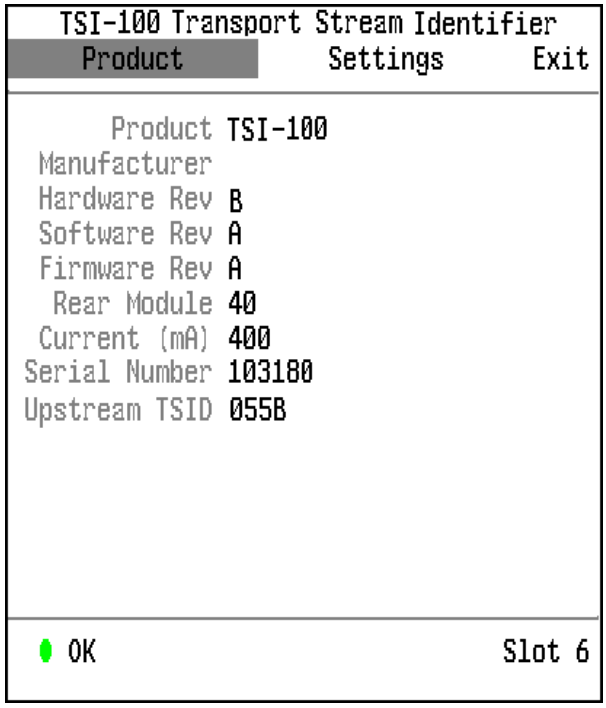


Figure 12. Transport Stream Identifier

Using the Menus

The available screens that can be selected are:

Status (left column)	Setup menus (centre column)	Exit (right column)
Product	TSID Setup	Exit
Alarms	Alarms	
GPIO Output	Setting	

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 "**TSID Setup**" is highlighted (brighter than other text), skip to step 3. If it is not highlighted, press the Menu Switch ***In*** to highlight it.
3. Press the Menu Switch ***Down*** or ***Up*** to step through the available menus.
4. When you reach **Settings**, select it by pressing the Menu Switch ***In***.
5. Now press the Menu Switch ***Down*** or ***Up*** to step through the available items that you can set on this menu.
6. When you reach the **TSID** item, select it by pressing the Menu Switch ***In***.
7. Now press the Menu Switch ***Down*** or ***Up*** to step through values for the first digit.
8. When you reach the desired value ,skip to the next digit by pressing ***Right***.

9. You can repeat steps 7-8 to select all 4 digits for the TSID.
10. Move down to "**Apply**" and press the Menu Switch ***In***. The TSID is now set.
11. To switch to a different menu, press the **Menu Switch *Up*** or ***Down*** repeatedly until the selection bar moves to the title (**Setup Encoding**). Press the **Menu Switch *In*** and return to step 3.

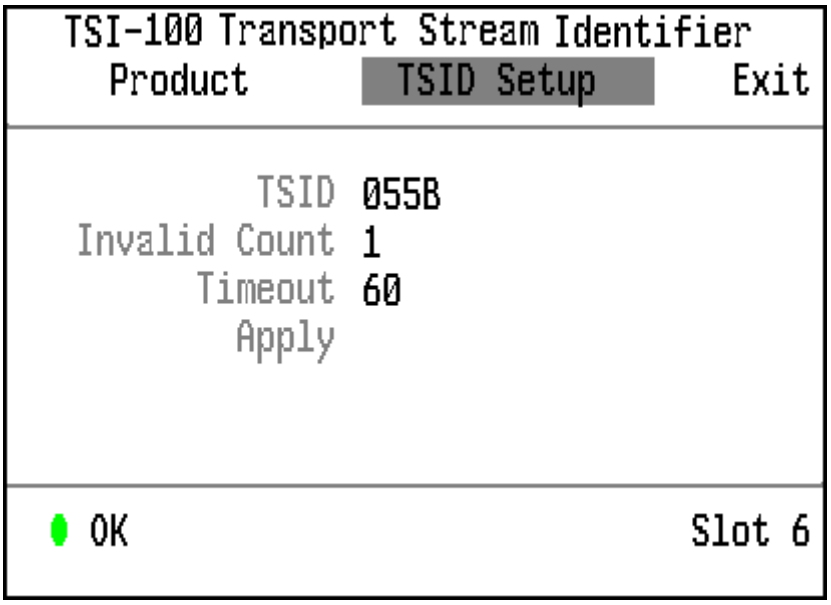


Figure 13. Setting The Card Function

Specifications

In This Chapter

This chapter includes the technical specifications for the TSI-100. Note that specifications are subject to change without notice.

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 Video 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 TSI-100, the following basic troubleshooting checklist may help identify the source of the problem. If the module still does not appear to be working properly after checking all possible causes, please contact your openGear products distributor, or the openGear Technical Support department at the numbers listed under the "**Contact Us**" section at the end of this manual.

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

Power LED Conditions

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

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

Bootload Sequence

In the unlikely event of a complete card failure, you may be instructed by a Ross Video Technical Support specialist to perform a complete software reload on the TSI-100. To perform this task, follow these steps:

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

   The Power LED will flash GREEN while the card is waiting for a new software load.

   If a new software load is not sent to the card within 60 seconds, the card will attempt to restart with the last operational software load.

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

Warranty and Repair Policy

The TSI-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 TSI-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 TSI-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 TSI-100. Ross Video policy dictates that all repairs to the TSI-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 TSI-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 TSI-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.

Notes:

Notes:

Contact Us

Contact our friendly and professional support representatives for the following:

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

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

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- Related products and full product lines
- Trade show information
- News

Ross Part Number: TSI100DR-005-02