



TSI-100 User Guide

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 - develop great products that customers love

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



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

TSI-100 · User Guide

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Patents

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

Notice

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

Safety Notices

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

Statement of Compliance

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

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

EMC Notices

US FCC Part 15

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

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

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

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

Canada

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

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

European Union

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



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

Australia/New Zealand

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

Korea

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

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

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

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

International

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

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

Maintenance/User Serviceable Parts

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

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

Environmental Information

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

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

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



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

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Introduction

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

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

Related Publications

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

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

Documentation Conventions

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

Interface Elements

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

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

User Entered Text

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

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

Referenced Guides

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

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

Menu Sequences

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

Important Instructions

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

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

Contacting Technical Support

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

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

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

Before You Begin

The TSI-1000 extracts the Transport Stream Identifier (TSID) from an ATSC ASI transport stream and closes GPIO contacts when the value does not 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.

The TSI-100 monitors the ASI transport stream and provides a GPIO output when the TSID is not correct. This signal may be used to control other devices or to signal the fault.

The TSI-100 is ideally suited for use in remote television broadcast translators to mute or power off the re-transmitter when the main broadcast goes off the air. It may also be used in a cable head-end for the same purpose.

Features

The following features make the TSI-100 ideal solution for detecting a change in a transport stream source:

- Signals a remote device or alarm when an incorrect transport stream or no transport stream is present
- Simple setup, enter the TSID of the transport stream
- Two GPIOs provide both normally open and normally closed signaling
- SNMP capable for monitoring with third-party systems
- User configurable “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
- Fits openGear frames

Functional Block Diagram

This section provides the functional block diagram that outlines the workflow of the TSI-100.

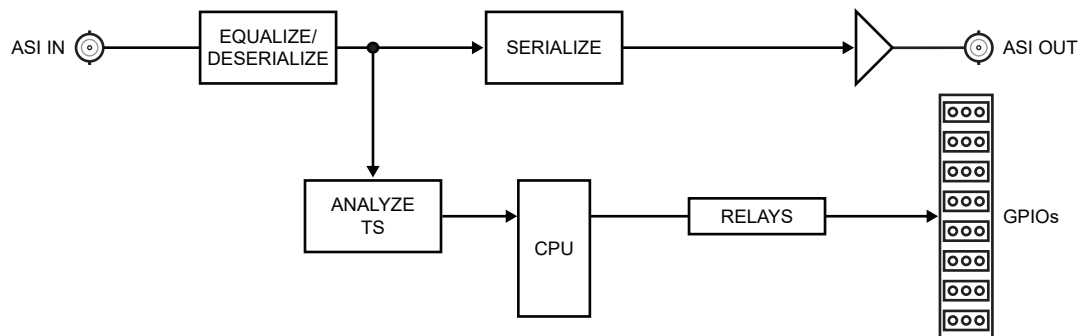


Figure 1.1 Simplified Block Diagram

User Interfaces

The TSI-100 includes the following user interfaces.

DashBoard

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

For More Information on...

- the TSI-100 menus in DashBoard, refer to the chapter “**Configuration**” on page 4-21.
- using DashBoard, refer to the ***DashBoard User Guide*** available from our website.

SNMP Monitoring and Control

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

For More Information on...

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

Hardware Overview

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

Card Overview

This section provides a general overview of the TSI-100 card components.

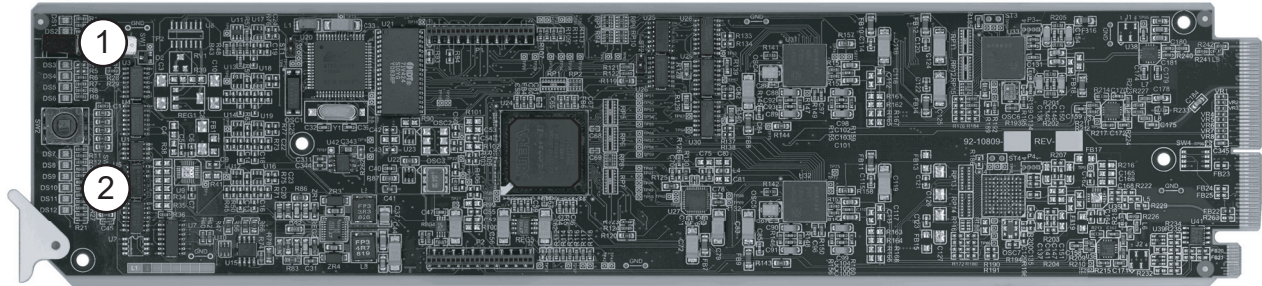


Figure 2.1 TSI-100 — Components

1) Bypass Switch (SW1)	2) Reset Switch (SW3)
------------------------	-----------------------

1. Bypass Switch (SW1)

If the TSI-100 is installed in a rear module that has a bypass relay, this two-position push-button is used to control the relay.

- › When the push-button is in the **IN** position, the TSI-100 is in the video signal path. It is recommended to set **SW1** in the **IN** position at all times.
- › 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.

2. Reset Switch (SW3)

This button is used for rebooting the card.

Control and Monitoring Features

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

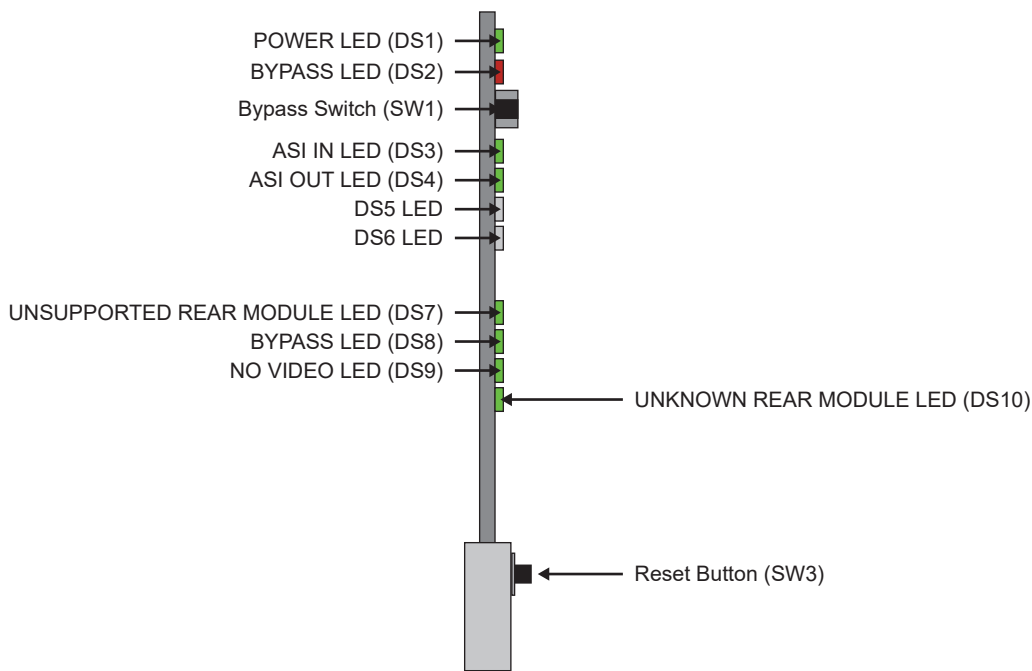


Figure 2.2 TSI-100 Card-edge Controls

Status and Selection LEDs on the TSI-100

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

Table 2.1 LEDs on the TSI-100

LED	Color	Display and Description
POWER (DS1)	Green	When lit green, this LED indicates that the card is running with a valid input.
	Flashing Green	When flashing green, this LED indicates that the bootloader is waiting for a software upload.
	Yellow	When lit yellow, this LED indicates there is a warning for a signal or a configuration error is occurring.
	Red	When lit red, this LED indicates that the card is not operational. This will occur if, for example, there is not video input.
	Off	When off, this LED indicates that there is no power.
BYPASS (DS2)	Red	When lit red, this LED indicates the card is in bypass mode.
	Off	When off, this LED indicates the card is in the video path and is capable of inserting data.
ASI IN (DS3)	Green	When lit green, this LED indicates the ASI input is present and valid.
	Off	When not lit, this LED indicates that 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 (DS4)	Green	When lit green, this LED indicates the ASI output serializer is locked to a valid input.
DS5	This LED is not implemented.	
DS6	This LED is not implemented.	

Table 2.1 LEDs on the TSI-100

LED	Color	Display and Description
Unsupported Rear Module (DS7)	Green	When lit green, this LED indicates correct operation.
	Red	When lit red, this LED indicates that the rear module connected to the TSI-100 is not supported by the software. Operation will not be correct.
BYPASS (DS8)	Green	When lit green, this LED indicates correct operation.
	Red	When lit red, this LED indicates the TSI-100's ASI is bypassed (redundant with DS2).
NO VIDEO (DS9)	Green	When lit green, this LED indicates correct operation.
	Red	When lit red, this LED indicates no valid input is present (redundant with DS3).
UNKNOWN REAR MODULE (DS10)	Green	When lit green, this LED indicates correct operation.
	Orange	When lit orange, this LED indicates that the rear module connected to the TSI-100 is not recognized by the software. Operation may not be correct.

Cabling for the TSI-100

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. The type of rear module depends on the frame the card is installed in.

★ It is not necessary to terminate unused outputs.

MDL-R10 Rear Module

This rear module is required when installing the TSI-100 in the DFR-8310 series frames. Each MDL-R10 occupies one slot and accommodates one card. Each rear module provides one ASI input, one ASI output, one analog output for on-screen display, and relay-isolated GPIO outputs. (**Figure 2.3**)

MDL-R20 Rear Module

Each MDL-R20 occupies two slots and accommodates one card. Each rear module provides one ASI input, one ASI output, one analog output for on-screen display, and relay-isolated GPIO outputs. (**Figure 2.3**)

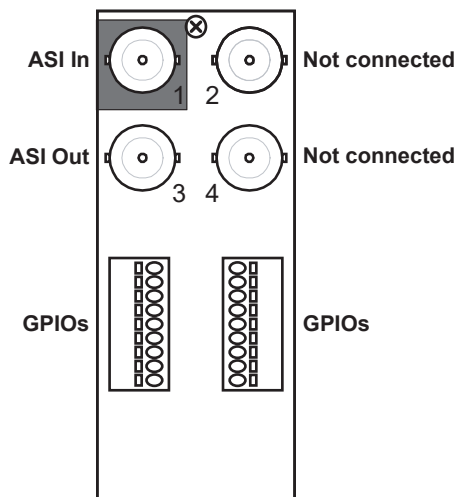


Figure 2.3 Cabling for the MDL-R10 and MDL-R20 Rear Modules

Connections Overview

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

ASI In — BNC 1

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

ASI Out — BNC 3

BNC 3 carries a reclocked copy of the ASI signal applied to **BNC 1**.

GPIOs

Two blocks of relay-isolated GPIO outputs are provided on each rear module. Refer to **Figure 2.4** for MDL-R10 pinouts and **Figure 2.5** for MDL-R20 pinouts.

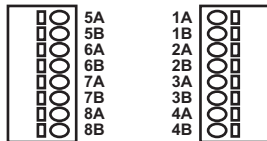


Figure 2.4 GPIO Pinouts for the MDL-R10 Rear Module

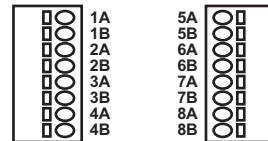


Figure 2.5 GPIO Pinouts for the MDL-R20 Rear Module

Physical Installation

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

Before You Begin

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

Static Discharge

Throughout this chapter, please heed the following cautionary note



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

Unpacking

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

Quick Start

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

Installing the TSI-100

Connect the openGear frame to your LAN. Refer to the *OGX-FR Series User Guide* and the *MFC-OG3-N and MFC-8322-S User Guide* for details.

1. Install the DashBoard client on a computer connected to the LAN. The DashBoard Control System software and user manual is available from the Ross Video website.
2. Install the required Full Rear Module in the frame as described in the section “**Installing a Rear Module**” on page 18.
3. Install a TSI-100 into the rear module as described in the section “**Installing the TSI-100**” on page 19.
4. Connect a video signal to the SDI IN BNC on the rear module of the TSI-100 as described in the section “**Cabling for the TSI-100**” on page 15.
5. Power on the frame.

Configuring the TSI-100

1. Launch the DashBoard client on your computer.
 - a. DashBoard should automatically find your frame within a minute or two.
 - b. Expand the frame node you installed the TSI-100 to display a list of cards in the frame.
 - c. Double-click the node for the TSI-100 you wish to configure for encoding.
 - d. A tab for the card displays in the **Device View** of the DashBoard client.

2. Re-name the card as follows:
 - a. Select the **Settings** tab.
 - b. Re-name the card. This will make the card easily identifiable within DashBoard especially when there is more than one card to configure.
 - c. Click **Apply**.
3. Select the **TSID Setup** tab.
4. In the **TSID Value** field, enter the 4-digit TSID you wish to match on.
5. In the **Wrong TSID Count** field, specify the number of invalid TSIDs that are needed to trigger a change in the GPIO state.
6. In the **No TSID Timeout** field, specify the amount of time without a TSID before triggering a change in GPIO state.
7. Connect the GPIO 1 or GPIO2 output of the TSI-100 to the device you wish to trigger. GPIO1 will be low and GPIO2 will be high when the transport stream is present and the TSID is correct.

Installing the TSI-100

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

Rear Modules for the TSI-100

When installing the TSI-100:

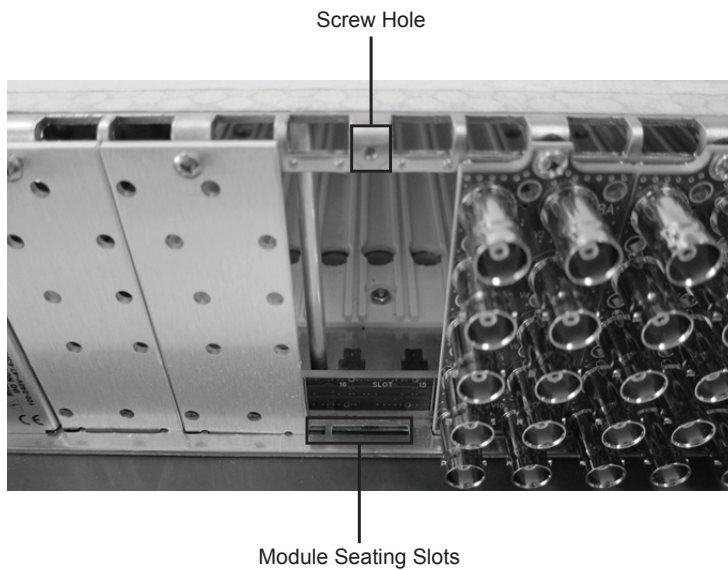
- **DFR-8310 series frames** — The **MDL-R10** Full Rear Module is required.
- ★ The TSI-100 is not compatible with the DFR-8310-BNC frames.
- **DFR-8321 series, OG3-FR series, and OGX-FR series frames** — The **MDL-R20** Full Rear Module is required.

Installing a Rear Module

If the Rear Module is installed, proceed to the section “**Installing the TSI-100**” on page 19.

To install a rear module in your openGear frame

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



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

Installing the TSI-100

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

To install the TSI-100 in an openGear frame

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

Configuration

This chapter explains how to use the user interface to set up the TSI-100. This discussion is based on the use of DashBoard through a network connection. The order of sections in this chapter follows the work-flow required to setup the TSI-100 for operation. It is recommended that you proceed through the following sections in order to achieve the best possible understanding of the product.

Configuration

This section provides a summary of the initial tasks you may wish to perform before configuring your card for detecting a change in a transport stream source.

General Settings

Before proceeding to any of the other sections, please ensure that these settings are correct, as they will have an effect on the operation of the other functions.

To configure the general settings

1. Select the **Settings** tab.
2. Type a unique name for your card in the **Card ID** field. This is especially useful if you have more than one TSI-100 in a frame. If this field is blank, the name is just “TSI-100”.
3. You can save the **Configuration** of the card to a file on a PC by clicking **Save**.

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

TSID Setup

This section outlines how to configure the card for matching transport stream identifiers (TSID).

To set up the card to detect TSID

1. Select the **TSID Setup** tab.
2. Set the **TSID Value** (4 digit hex value). If the incoming signal contains a TSID that does not match this value, the GPIOs become active.
3. Set the **Wrong TSID Count** value. This specifies the number of consecutive invalid TSIDs to process before activating the GPIOs.
4. Set the **No TSID Timeout** value. This specifies the amount of time, in 1/10th of a second, to wait with no incoming TSID before activating the GPIOs.

Monitoring

The TSI-100 has several alarms that can affect the overall status of the card. This section outlines the three status tabs for the TSI-100. These Status tabs provide read-only information to help monitor the TSI-100 via DashBoard. The indicators in the Status tabs can vary in severity from green (valid) to red (alarm). DashBoard reports the most severe alarm for a single field.

Product Status

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

Alarms Status

The **Alarms** status reports the current state of all the signals that can cause alarms. If you wish to disable an individual alarm clear the corresponding box in the **Alarms** setup tab. The following fields are displayed in the **Alarms** status tab:

- **Card Status** — This field reports error conditions as specified in the **Alarms** setup tab.
- **Incoming ASI** — This field reports the length and speed of the incoming ASI packet.
- **Video Bypass** — This field reports if the card is in Active or Bypass mode (based on how **SW1** is set on the card-edge).
- **Video** — This field reports when a valid input signal is connected or not to the rear module.
- **Rear Module** — This field reports when an unsupported rear module is installed with the TSI-100.
- **TSID** — This field reports the four digit hex number (Transport Stream Identification).

GPIO Output Status

The following fields are displayed in the **GPIO Output** tab:

- **Card Status** — This field reports if the GPIO connection are valid (green), or if no video source or unsupported rear module is connected.
- **Incoming ASI** — This field reports the length and speed of the packet.
- **Bypass State** — This field reports if the card is in Active or Bypass mode (based on how SW1 is set on the card-edge)
- **GPIO #** — This field reports the state of the specified GPIO. The TSI-100 has two active GPIOs. GPIO 1 is active high and GPIO 2 is active low. An active GPIO output produces a switch closure on the rear module.

Upgrading the Software

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

To upgrade the software on a TSI-100

1. Contact Ross Technical Support for the latest software version file.
 2. Launch the DashBoard client on your computer.
 3. Display a tab for the card you wish to upgrade by double-clicking its status indicator in the **Basic Tree View**.
 4. From the **Device** tab, click **Upload** to display the **Select File for upload** dialog.
 5. Navigate to the ***.bin** upload file you wish to upload.
 6. Click **Open** and follow the on-screen instructions.
 7. Click **Finish** to start the upgrade.
 8. Monitor the upgrade.
 - A **Upload Status** dialog enables you to monitor the upgrade process.
 - The card reboots automatically once the file is uploaded. The card is temporarily taken off-line.
 - The reboot process is complete once the status indicators for the **Card State** and **Connection** return to their previous status.
- ★ If you are running DashBoard version 2.3.0 or lower, you must click **Reboot** in the **Device** tab to complete the upgrade process.

Troubleshooting

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

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

Technical Specifications

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

★ Technical specifications are subject to change without notice.

Table 6.1 TSI-100 Technical Specifications

Category	Parameter	Specification
Transport Stream Inputs	Number of Inputs	1
	Input Signal Standard Accommodated	DVB-ASI (EN 50083-9)
	Impedance	75ohm terminating in Active mode
	Equalization	>100 m of Belden 1694A cable
	Return Loss	>15dB to 270 MHz
Transport Stream Outputs	Number of Outputs	1 ASI input monitor
	Impedance	75ohm
	Return Loss	>10dB to 270MHz
	Signal Level	800mV $\pm$ 10%
	DC Offset	0V $\pm$ 50mV
	Rise & Fall Time (20-80%)	700ps typical
	Overshoot	<8%
GPIO Outputs	Number and Type of Inputs or Outputs	8 pairs of isolated contacts (Max 0.1A)
Power	Maximum Power Consumption	5W

Service Information

This chapter provides a Troubleshooting Checklist and the Warranty and Repair Policy for your TSI-100.

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 frame still does not appear to be working properly after checking all possible causes, please contact your openGear products distributor, or the Technical Support department at the numbers listed under the “**Contact Us**” section.

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

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

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

Glossary

The following terms are used throughout this guide:

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

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

CBR — constant bit rate.

CDN — content distribution network.

DashBoard — the DashBoard Control System.

DF — Differentiated Services.

DTVCC captions — CEA-708 captions.

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

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

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

MIB — management information base.

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

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

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

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

PCR — program clock reference.

PID — packet identifier.

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

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

TPG — Test Packet Generator.

User — the person who uses the TSI-100.

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

