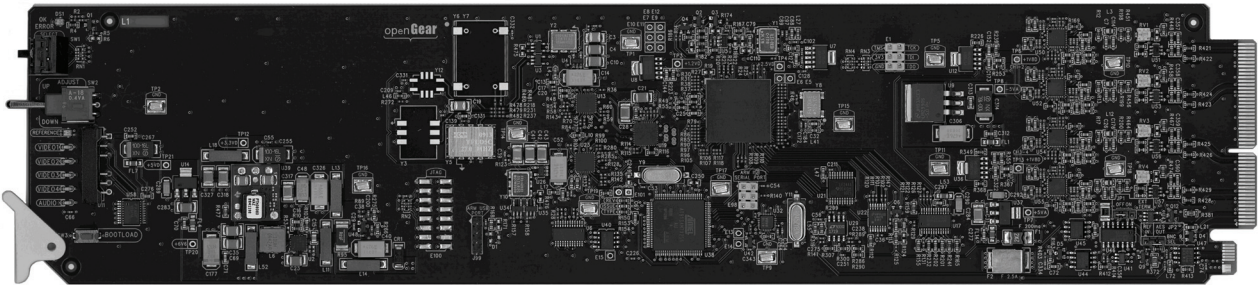


**SPG-8260**  
**Sync Pulse Generator**  
**User Manual**



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## SPG-8260 • Sync Pulse Generator User Manual

- Ross Part Number: **8260DR-004-01**
- Release Date: March 31, 2010. Printed in Canada.

The information contained in this manual is subject to change without notice or obligation.

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This product is protected by the following US Patents: 4,205,346; 5,115,314; 5,280,346; 5,561,404; 7,034,886; 7,508,455. This product is protected by the following Canadian Patents: 2039277; 1237518; 1127289. Other patents pending.



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## 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.

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- DashBoard Control System™ is a trademark of Ross Video Limited.
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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 to avoid personnel injury and to prevent product damage.

Products may require specific equipment, and/or installation procedures to 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



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*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.*

---



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**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.

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**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.

---



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**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 an ESD event.

---

## Important Safety Instructions



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**Caution** — This product is intended to be a component product of the DFR-8300 series frame. Refer to the DFR-8300 series frame User Manual for important safety instructions regarding the proper installation and safe operation of the frame as well as its component products.

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**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 cards from the chassis’ rear appliance connectors before servicing this area.

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**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 with 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 time and rating. Only use attachments/accessories specified by the manufacturer.

---

## EMC Notices

### ***United States of America 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 Limited could void the user's authority to operate this equipment.*

---

### **CANADA**

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

Cet appareil numérique de la classe "A" est conforme a 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

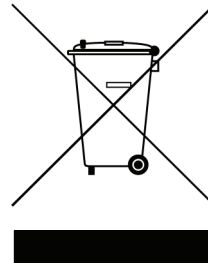
Routine maintenance to this openGear product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. All openGear products 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 that you purchased required the extraction and use of natural resources for its production. It 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

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## In This Chapter

This chapter contains the following sections:

- Overview
- Functional Block Diagram
- Documentation Terms and Conventions

## A Word of Thanks

Congratulations on choosing an **SPG-8260 Sync Pulse Generator**. Your SPG-8260 is part of a full line of Digital Products backed by Ross Video's experience in engineering and design expertise since 1974.

You will be pleased at how easily your new SPG-8260 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 SPG-8260, please contact us at the numbers listed on the back cover of this manual. Our technical support staff is always available for consultation, training, or service.

---

## Overview

The SPG-8260 generates four pairs of outputs with each pair independently programmed to be either a tri-level sync or a composite signal. Each pair of outputs can be independently delayed relative to the selected incoming reference or to each other when using an internal reference. The delay is in increments of the output's interface sampling frequency (74.25MHz, 74.25/1.001 MHz or 13.5MHz) up to one frame of video. The SPG-8260 can also generate up to two AES or Word Clock outputs.

The SPG-8260 is able to lock to one of the two frame references or the external reference input on the rear module.

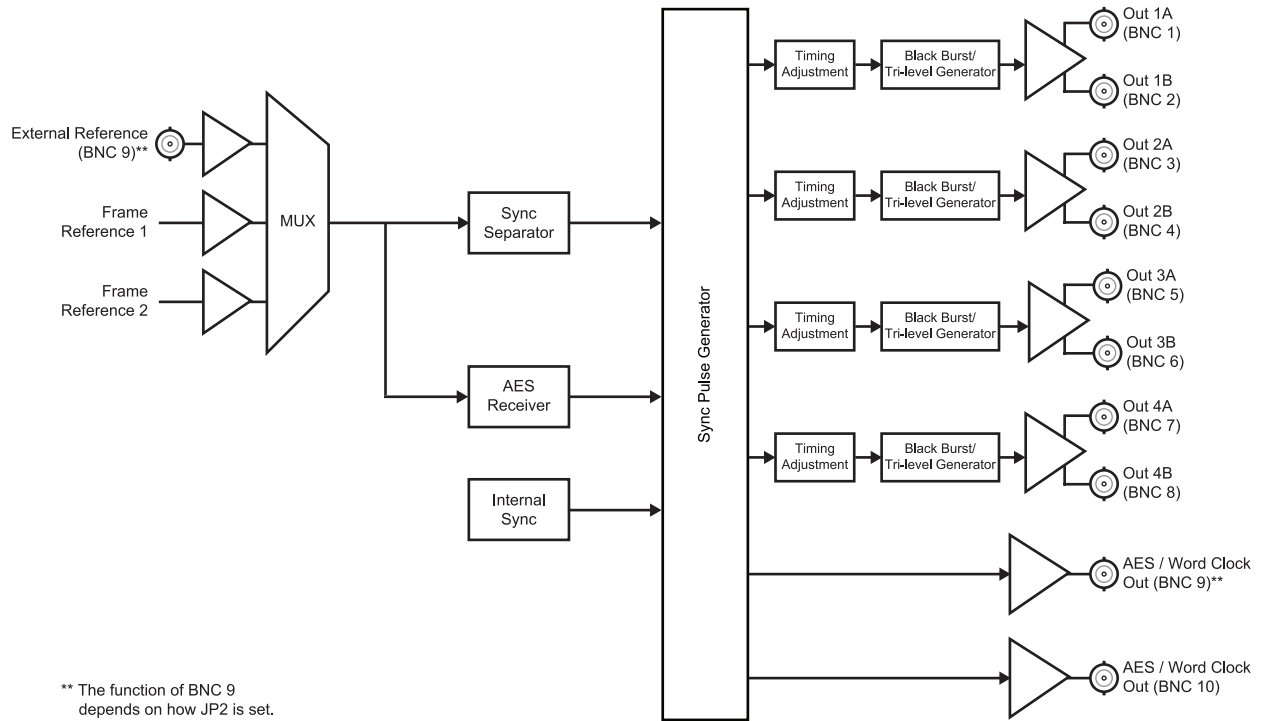
## Features

The following features make the SPG-8260 the ideal Sync Pulse Generator:

- AES interfaces conform to SMPTE 276M, and AES-3id-2001
- HD interfaces conform to SMPTE 274M and SMPTE 296M
- SD interfaces conform to SMPTE-170M (NTSC) and PAL-B standards
- Generates four pairs of outputs
- Each pair of outputs can be independently timed (delayed) relative to the incoming reference
- Composite outputs can be black or SMPTE color bars
- Tri-level sync output format is selectable from the following formats:
  - › 1080i 60/59.94/50 Hz
  - › 720p 60/59.94/50/30/29.97/25/24/23.98 Hz
  - › 1080p 30/29.97/25/24/23.98 Hz
  - › 1080pSF 24/23.98 Hz
- Generates an AES Reference signal or a Word Clock output
- Tone option for AES outputs
- Reports status and configuration remotely via the DashBoard Control System™
- Fits DFR-8300 series frames
- 5-year transferable warranty

# Functional Block Diagram

This section provides a functional block diagram that outlines the workflow of the SPG-8260.



**Figure 1.1** SPG-8260 — Simplified Block Diagram

---

# Documentation Terms and Conventions

The following terms and conventions are used throughout this manual:

- “**Frame**” refers to DFR-8300 series frame that houses the SPG-8260, as well as any openGear frames.
- All references to the **DFR-8300 series frame** also includes all version of the 10-slot (DFR-8310 series) and 20-slot (DFR-8321 series) frames and any available options unless otherwise noted.
- “**Operator**” and “**User**” refer to the person who uses SPG-8260.
- “**Board**”, and “**Card**” refer to openGear terminal devices within openGear frames, including all components and switches.
- “**System**” and “**Video system**” refer to the mix of interconnected production and terminal equipment in your environment.
- “**525-line mode**” refers to broadcast situations using **NTSC** composite (analog) signal reference inputs.
- “**625-line mode**” refers to broadcast situations using **PAL-B** composite (analog) signal reference inputs.
- “**PAL**” refers to PAL-B unless otherwise stated.
- “**DashBoard**” refers to the DashBoard Control System™.
- The “**Operating Tip**” and “**Note**” boxes are used throughout this manual to provide additional user information.

# Installation

---

## In This Chapter

This chapter provides instructions for installing the Rear Modules for the SPG-8260, installing the card into the frame, cabling details, and updating the card software.

The following topics are discussed:

- Before You Begin
- Installing the SPG-8260
- Cabling for the SPG-8260
- Software Upgrades for the SPG-8260

---

## Before You Begin

Before proceeding with the instructions in this chapter, ensure that your DFR-8300 series frame is properly installed according to the instructions in the *DFR-8300 Series User Manual*.

### Static Discharge

Whenever handling the SPG-8260 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 synthetic fiber clothing is worn. Always exercise proper grounding precautions when working on circuit boards and related equipment.*

---

### Unpacking

Unpack each SPG-8260 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.

---

# Installing the SPG-8260

This section outlines how to install a Rear Module in a DFR-8300 series frame. The same procedure applies regardless of the frame or card type. However, the specific Rear Module you need to install depends on your application and the openGear frame you are using.

## Rear Modules for the SPG-8260

The Rear Module for the SPG-8260 depends on the openGear frame you are installing the card into.

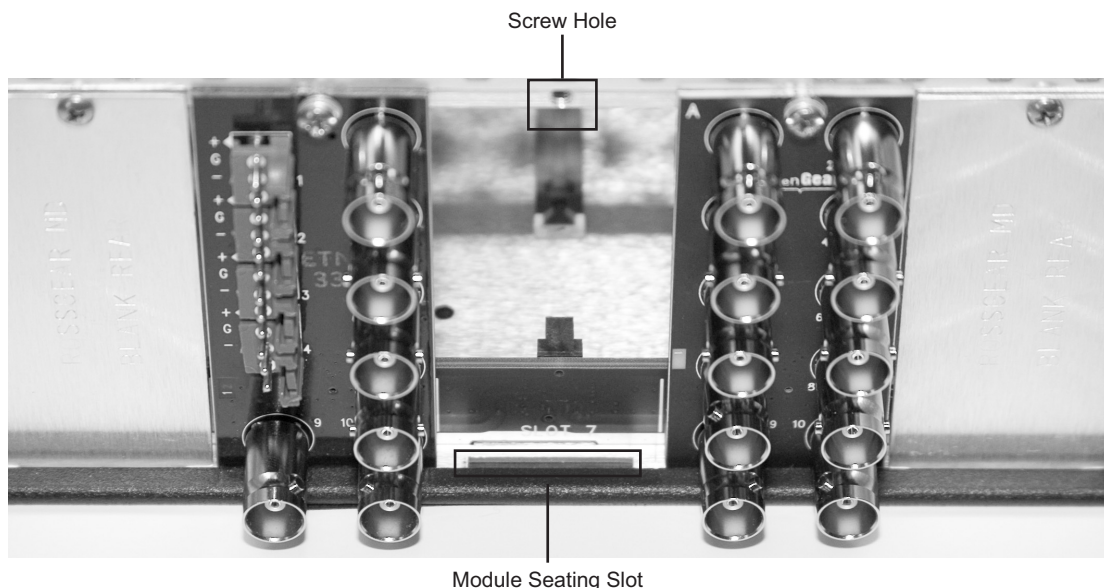
- **DFR-8310 series frame** — When installing the SPG-8260 in the DFR-8310 series frames, the **8310AR-030** (R1-8260) Rear Module is required. The SPG-8260 is also compatible with the DFR-8310-BNC frame.
- **DFR-8321 series frame** — When installing the SPG-8260 in the DFR-8321 series frame, the **8320AR-030** Full Rear Module (R2-8260) or the **8320AR-031** Split Rear Module (R2S-8260). Note that the available cable designations differ between the type of module used. Refer to the section “**DFR-8321 Series Frame Cabling Overview**” on page 2-5 for details.

## Installing a Rear Module

If you are installing the SPG-8260 in a DFR-8310-BNC frame, or the Rear Module is already installed, proceed to the section “**Installing the SPG-8260**” on page 2-4.

Use the following procedure to install a Rear Module in your DFR-8300 series 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 SPG-8260 installation.
3. Install the bottom of the Rear Module in the **Module Seating Slot** at the base of the frame’s back plane. (**Figure 2.1**)



**Figure 2.1** Rear Module Installation in a DFR-8310 Series Frame (SPG-8260 not shown)

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.

This completes the procedure for installing a Rear Module in your DFR-8300 series frame.

## Installing the SPG-8260

Use the following procedure to install the SPG-8260 in a DFR-8300 series frame:

1. Locate the Rear Module you installed in the procedure “**Installing a Rear Module**” on page 2-3.
2. Hold the SPG-8260 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 is properly seated in the Rear Module.
4. Affix the supplied **Rear Module Label** to the BNC area of the Rear Module.

This completes the procedure for installing the SPG-8260 in a DFR-8300 series frame.



# Cabling for the SPG-8260

This section provides information for connecting cables to the installed Rear Modules on the DFR-8300 series frames. Connect the input and output cables according to the following sections.

## For More Information...

- on configuring BNC 9 and/or BNC 10, refer to the section “Card Overview” on page 3-2.

## DFR-8310 Series Frame Cabling Overview

In the DFR-8310 series frames, the SPG-8260 is used with the following Rear Module:

- **8310AR-030** Rear Module (R1-8260) — Each card occupies one slot and provides eight video outputs. Depending on your configuration, there can be a reference input or an AES output on BNC 9, and an AES output or a Word Clock output on BNC 10. (**Figure 2.2**)

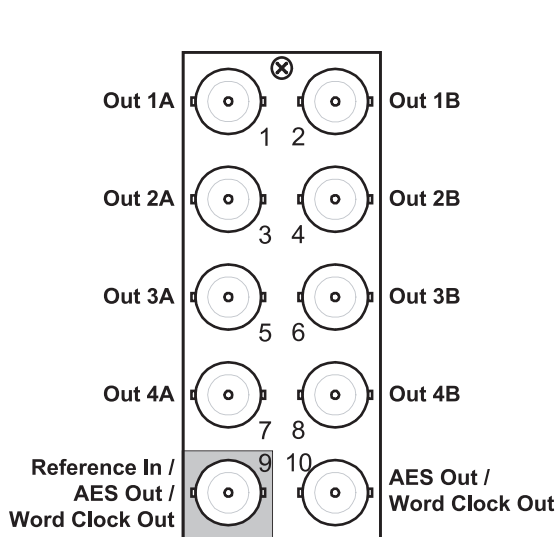


Figure 2.2 Cable Connections for the R1-8260 and R2-8260 Rear Modules

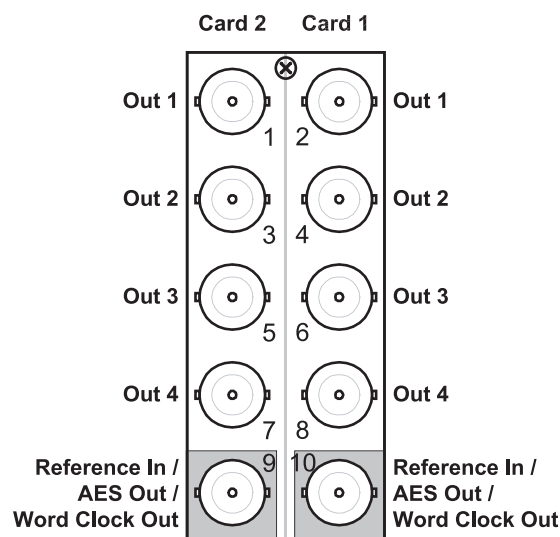


Figure 2.3 Cable Connections for the R2S-8260 Rear Module

## DFR-8321 Series Frame Cabling Overview

In the DFR-8321 series frames, the SPG-8260 is used with the following Rear Modules:

- **8320AR-030** Full Rear Module (R2-8260) — Each card occupies two slots and provides eight video outputs. Depending on your configuration, there can be a reference input or an AES output on BNC 9, and an AES output or a Word Clock output on BNC 10. (**Figure 2.2**)
- **8320AR-031** Split Rear Module (R2S-8260) — Each card occupies one slot and provides four video outputs. Depending on your configuration, an AES or Word Clock output is available. (**Figure 2.3**)

---

# Software Upgrades for the SPG-8260

This section provides instructions for upgrading the software for your SPG-8260 using the DashBoard Control System™.

## Performing Software Upgrades

Use the following procedure to upload software to the SPG-8260:

1. Contact Ross Technical Support for the latest software version file.
2. In DashBoard, display the **Device** tab of the SPG-8260 by double-clicking its status indicator in the **Basic Tree View**.
3. From the **Device** tab, click **Upload** to display the **Select File for upload** dialog box.
4. Navigate to the \*.bin upload file you wish to upload. DashBoard automatically selects the last directory that you loaded from.
5. Click **Open** to display a confirmation dialog box. This dialog box displays the selected upload file name, type, size, and the file creation date.
6. From the **Confirmation** dialog box, select one of the following:
  - **Cancel** — Select this option to cancel the upload of the file and return to the **Device View**.
  - **Continue** — Select this option to upload the file. While uploading, an **Uploading Progress** dialog box opens.



**Important** — *Clicking the **Cancel** button while uploading will leave the card in an invalid state. Do not click **Cancel** unless the uploading progress has stopped completely for 60 seconds or more.*

---

7. Monitor the upgrade progress bar displayed in DashBoard while the software is upgraded on your SPG-8260.
8. To complete the upgrade process, you must reboot the card as follows:
  - From the **Device** tab, click **Reboot** to reboot SPG-8260. The reboot process takes up to 30 seconds.



**Note** — *The communications processor of the SPG-8260 requires approximately 30 seconds to re-start and re-establish network communications.*

---

- The SPG-8260 automatically saves all your settings before starting the reboot process.
- The status of all the cards in the frame are grayed out until the reboot process is complete.

This completes the procedure to upload software to the SPG-8260.

# User Controls

---

## In This Chapter

This chapter provides a general overview of the user controls available on the SPG-8260.

The following topics are discussed:

- Card Overview
- Control and Monitoring Features
- Timing and Reference
- Output Notes

# Card Overview

This section provides a general overview of the SPG-8260 components. The configurations outlined in this section should be performed before installing the card in the frame, but may be repeated as required. For details on the LEDs available on the card-edge, refer to the section “Control and Monitoring Features” on page 3-3.

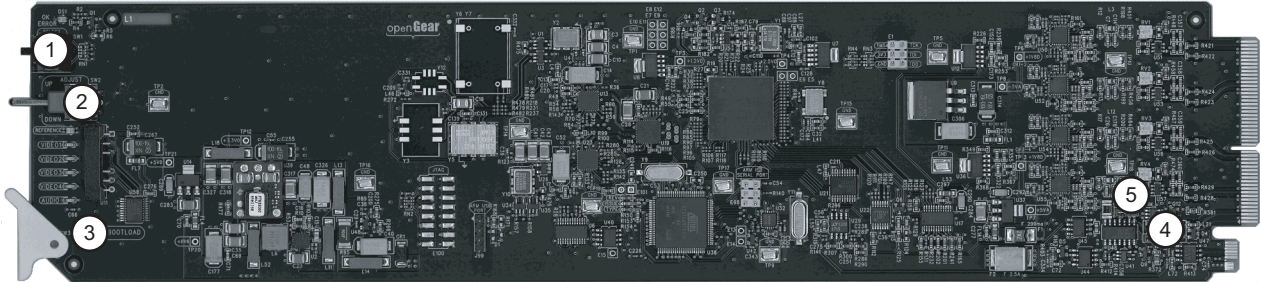


Figure 3.1 SPG-8260 — Card-edge Components

1) Function Select Switch (SW1)	3) Bootload Button (SW3)	5) EXT TERM Jumper (JP1)
2) Mode Select Switch (SW2)	4) Reference In/AES Out Jumper (JP2)	

## 1. Function Select Switch (SW1)

Use **SW1** to select general operation functions and menu items and works in conjunction with the Mode Select Switch (**SW2**). Refer to the section “Card-edge Menu System” on page 4-7.

## 2. Mode Select Switch (SW2)

Use **SW2** to enable, disable, and select specific configurations within the operational function modes menu (selected first with **SW1**).

## 3. Bootload Button (SW3)

Use **SW3** is used for factory service in the unlikely even of a complete card failure. Do not press this button unless instructed to do so by Ross Technical Support personnel. Refer to the section “Bootload Button” on page 6-2.

## 4. Reference In/AES Out Jumper (JP2)

An AES/Word Clock output, or a local reference input, is also available on one of the bottom BNCs. Depending on the Rear Module you are using, the AES/Word Clock output or a reference input is available on BNC 9 (8310AR-030, 8320AR-030 Full Rear modules), or the bottom BNC (8320AR-031 Split Rear module).

Use **JP2** to select the function of BNC 9 (bottom BNC). Select from the following:

- **REF IN** — Select this option to enable the BNC to use the local reference input.
- **AES OUT** — Select this option to enable the BNC to output an AES signal or a copy of the Word Clock signal.

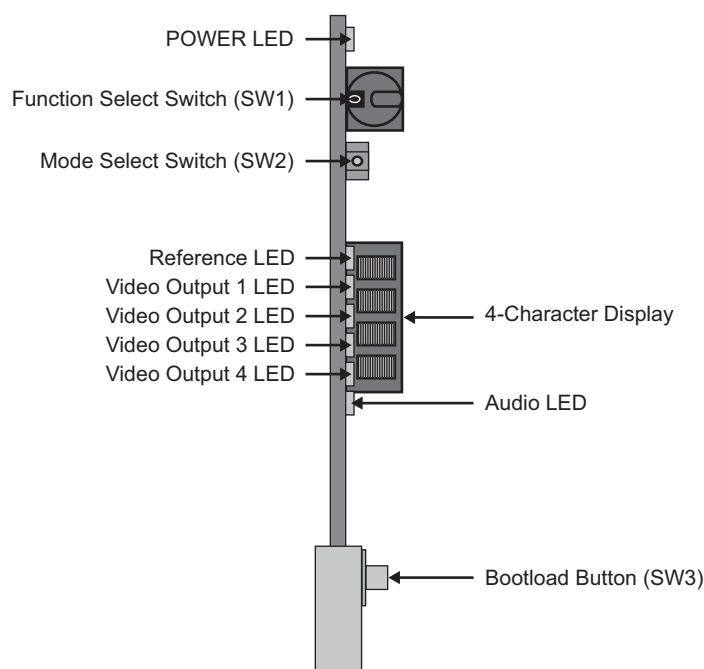
## 5. EXT TERM Jumper (JP1)

Use **JP1** to terminate the signal on the Reference input when **JP2** is set to **REF IN**. Select from the following:

- **ON** — Select this option to terminate the signal on the card. Note that it is recommended to select this option when **JP2** is set to **AES OUT**.
- **OFF** — Select this option to leave the signal un-terminated (signal terminated externally on the cable).

## Control and Monitoring Features

This section provides information on the jumpers, buttons and LEDs for the SPG-8260. Refer to **Figure 3.2** for the location of the LEDs and controls.



**Figure 3.2** SPG-8260 Card-edge Controls

### Status and Selection LEDs on the SPG-8260

The front-edge of the SPG-8260 has LED indicators for the cooling module fan, alarm, and communication activity. Basic LED displays and descriptions are provided in **Table 3.1**.

**Table 3.1** LEDs on the SPG-8260

LED	Color	Display and Description
<b>POWER</b>	Green	When lit green, this LED indicates that the card is functioning normal and that no anomalies have been detected. The following condition must be satisfied: <ul style="list-style-type: none"> <li>• a valid reference signal is present when a reference is required</li> </ul>
	Flashing Green and Red	When flashing green and red, this LED indicates that a valid reference signal is not present on the selected reference input.
	Red	When lit red, this LED indicates that the card is experiencing internal errors.
<b>Reference</b>	Green	When lit green, this LED indicates that the card is locked to the external reference.
	Yellow	When lit yellow, this LED indicates that the card is using the internal reference source.
	Off	When unlit, this LED indicates that the current selected reference is not available or the reference format is not supported.

**Table 3.1 LEDs on the SPG-8260**

<b>LED</b>	<b>Color</b>	<b>Display and Description</b>
<b>Video Output 1</b>	Green	When lit green, this LED indicates that Output 1 (BNC 1 and 2) is Genlocked to the selected reference or the internal reference is used.
	Flashing Green	When flashing green, this LED indicates that Output 1 (BNC 1 and 2) cannot be genlocked to the selected reference and is either Field Boundary locked, Clock locked, or free running.
<b>Video Output 2</b>	Green	When lit green, this LED indicates that Output 2 (BNC 3 and 4) is genlocked to the selected reference and the internal reference is used.
	Flashing Green	When flashing green, this LED indicates that Output 2 (BNC 3 and 4) cannot be genlocked to the selected reference and is either Field Boundary locked, Clock locked, or free running.
<b>Video Output 3</b>	Green	When lit green, this LED indicates that Output 3 (BNC 5 and 6) is genlocked to the selected reference and the internal reference is used.
	Flashing Green	When flashing green, this LED indicates that Output 3 (BNC 5 and 6) cannot be genlocked to the selected reference and is either Field Boundary locked, Clock locked, or free running.
<b>Video Output 4</b>	Green	When lit green, this LED indicates that Output 4 (BNC 7 and 8) is genlocked to the selected reference and the internal reference is used.
	Flashing Green	When flashing green, this LED indicates that Output 4 (BNC 7 and 8) cannot be genlocked to the selected reference and is either Field Boundary locked, Clock locked, or free running.
<b>Audio</b>	Green	When lit, this LED indicates that the AES reference is being output.
	Flashing Green	When flashing green, this LED indicates that the Word Clock is the output.
	Off	When not lit, this LED indicates that the audio output is disabled by the user.

# Timing and Reference

This section provides additional information on the timing and reference features of the SPG-8260.

## Frame Rate Compatibility

Refer to **Table 3.2** for frame rate compatibility where a check mark indicates a Genlock state, an “F” indicates a Field Lock state, and an “CL” indicates a Clock Lock state.

**Table 3.2 Genlock, Field Lock, and Clock Lock Matrix**

Locked Outputs	Inputs																
	1080i 60Hz	1080i 59.94Hz	1080i 50Hz	1080p 30Hz	1080p 29.97Hz	1080p 25Hz	1080p 24Hz	1080p 23.98Hz	720p 60Hz	720p 59.94Hz	720p 50Hz	1080pSF 24Hz	1080pSF 23.98Hz	480i 59.94Hz	576i 50Hz	AES Reference	Word Clock
1080i 60Hz	✓		CL	F		CL	CL		F		CL	CL			CL	CL	CL
1080i 59.94Hz		✓			F			CL		F			CL	✓		CL	CL
1080i 50Hz	CL		✓	CL		F	CL		CL		F	CL			✓	CL	CL
1080p 30Hz	✓		CL	✓		CL	CL		✓		CL	CL				CL	CL
1080p 29.97Hz		✓			✓			CL		✓			CL	✓		CL	CL
1080p 25Hz	CL		✓	CL		✓	CL		CL		✓	CL			✓	CL	CL
1080p 24Hz	CL		CL	CL		CL	✓		CL		CL	✓			CL	CL	CL
1080p 23.98Hz		CL			CL			✓		CL			✓	CL		CL	CL
720p 60Hz	✓		CL	✓		CL	CL		✓		CL	CL			CL	CL	CL
720p 59.94Hz		✓			✓			CL		✓			CL	✓		CL	CL
720p 50Hz	CL		✓	CL		✓	CL		CL		✓	CL			✓	CL	CL
720p 30Hz	✓		CL	✓		CL	CL		✓		CL	CL			CL	CL	CL
720p 29.97Hz		✓			✓			CL		✓			CL	✓		CL	CL
720p 25Hz	CL		✓	CL		✓	CL		CL		✓	CL			✓	CL	CL
720p 24Hz	CL		CL	CL		CL	✓		CL		CL	✓			CL	CL	CL
720p 23.98Hz		CL			CL			✓		CL			✓	CL		CL	CL
1080pSF 24Hz	CL		CL	CL		CL	✓		CL		CL	✓			CL	CL	CL
1080pSF 23.98Hz		CL			CL			✓		CL			✓	CL		CL	CL
480i 59.94Hz		✓			F					F				✓		CL	CL
576i 50Hz	CL		✓	CL		F			CL		F				✓	CL	CL
AES	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Word Clock	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

## Notes on Using the Matrix

When using **Table 3.2**, keep in mind the following definitions.

- **Genlock** — Occurs when the reference and the output frame/field rates are compatible.
- **Field Lock** — Occurs when the reference and the output frame/field rates are compatible but the reference is a progressive format and the output is an interlaced format.
- **Clock Lock** — Occurs when there is a fixed relationship between the reference and the output clock rates but when there is no direct relationship between the reference and output frame rates.

## Reference Signals

The SPG-8260 can lock to one of the two frame references, the reference input on the rear module, or free-run using the SPG-8260 internal oscillator.



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**Note** — *Switching between references may cause the outputs to glitch.*

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- When the selected reference is lost, the SPG-8260 switches to its internal oscillator.
- When the selected reference returns, the SPG-8260 locks back to the input reference.
- When running off the internal oscillator, the SPG-8260 ignores any signal on the other reference inputs.
- When running off the internal oscillator and the outputs are set to the same NTSC or PAL standard, the outputs will be color framed to each other.
- The SPG-8260 can operate without a reference by switching to the internal reference.



---

**Note** — *When using the internal reference, the outputs should be no more than +/- 1ppm from the nominal frequency, with a maximum drift of +/- 4.6ppm after 10 years.*

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## Color Framing

When a NTSC or PAL reference is connected to the card, and one or more of the outputs are set to the same standard as the reference, the color frame of the video outputs will match the reference. It is important to note that the SPG-8260 will not continuously color frame lock to the reference. The SPG-8260 will re-lock to the reference color frame only when one of the following conditions occur:

- **Card boot-up** — After a power on, or re-boot, with a valid NTSC or PAL reference signal applied to the selected reference input.
- **Change in reference** — Either by input selection, or removal and return, of the reference signal.
- **Output timing change** — Adjusting the output timing will trigger another color frame re-lock sequence.



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## Output Notes

This section provides additional information when configuring outputs of the SPG-8260.

### Alarms

The card-edge LEDs and DashBoard will alert the user when the reference and the selected frame rate does not match.

#### *For More Information...*

- on card-edge LEDs, refer to the section “**Status and Selection LEDs on the SPG-8260**” on page 3-3.
- on DashBoard status fields, refer to **Table 4.1**, **Table 4.4**, and **Table 4.5**.

### Free-run

While free-running, the SPG-8260 operates with an internal reference, and output timing can be adjusted relative to this internal reference. The timing of each output with respect to each other will be maintained.

While free-running, the SPG-8260 still conforms to the following:

- All AES interfaces conform to SMPTE 276M, and AES-3id-2001.
- All HD interfaces conform to SMPTE 274M, or SMPTE 296M.
- All SD interfaces conform to SMPTE 170M (NTSC) or ITU-R BT.470 (PAL-B).

### Using a Delay

Each pair of outputs can be independently timed relative to the reference. The delay will be in increments of the output’s interface sampling frequency up to one frame of video.

### Audio Output Timing

The SPG-8260 includes an **Audio Output Co-Timing** option in DashBoard and the card-edge menus. This option enables you to specify which video output the audio will follow. If there is any change, in timing or format, the audio attempts to re-lock thereby causing a glitch in the audio timing. If a tone is selected, the card mutes the tone during this period of re-acquiring of timing. The AES/Word Clock outputs are framed as per AES11-2009.

- **Audio Output Timing with an AES/Work Clock Reference** — If the reference into the SPG-8260 is AES or Word Clock, the audio outputs will be co-timed to the reference.
- **Audio Output Timing with a Video Reference** — If the reference into the SPG-8260 is a video signal, or if the SPG-8260 is set to the internal reference, the audio output (AES or Word Clock) will be co-timed to one of the video outputs.



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**Note** — *Ensure the selected output is Genlocked or Field Locked to the reference. If the card is in free-run, the selected output frame rate must be compatible with the selected frame rate.*

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#### *For More Information...*

- on the **Audio Output Co-Timing** option in DashBoard, refer to **Table 4.4**.



# Menus

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## In This Chapter

This chapter provides a summary of the menus available for the SPG-8260.

The following topics are discussed:

- SNMP Monitoring and Control
- DashBoard Menus for the SPG-8260
- Card-edge Menu System

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## SNMP Monitoring and Control

The Network Controller Card in the DFR-8300 series frame provides optional support for remote monitoring of your frame and the using Simple Network Management Protocol (SNMP), which is compatible with many third-party monitoring and control tools.

Refer to your SPG-8260 Management Information Base (MIB) file for a breakdown of SNMP controls on this card. Refer to the *DFR-8300 Series User Manual* and the *MFC-8300 Series User Manual* for additional information on SNMP Monitoring and Control.

## DashBoard Menus for the SPG-8260

This section briefly summarizes the menus, items, and parameters available from the DashBoard Control System™ for the SPG-8260. Default values are noted with an asterisk (\*).

The DashBoard Control System™ enables you to monitor and control openGear frames and cards from a computer. DashBoard communicates with other cards in the DFR-8300 series frame through the Network Controller Card.

### Signal Tab

Table 4.1 summarizes the **Signal** tab parameters available in DashBoard for the SPG-8260.

**Table 4.1 Signal Tab Items**

Tab Title	Item	Parameters	Description
<b>Signal (Read-only)</b>	Reference Status	Green	Indicates the presence of a valid reference signal
		Yellow - Locking	Indicates the presence of a valid reference signal, but the card has not locked to it yet
		Yellow - No Color Burst	Indicates the presence of a NTSC or PAL reference signal that does not include a valid color burst
		Red - No reference	Indicates that no signal is detected on the selected reference source
		Red - Unknown	Indicates that a signal is detected, but is not supported
	Reference Format	#	Specifies the reference format
		AES	
		Word Clock	
		Unknown	Indicates that the reference is an unsupported format

### Hardware Tab

Table 4.2 summarizes the **Hardware** tab parameters available in DashBoard for the SPG-8260.

**Table 4.2 Hardware Tab Items**

Tab Title	Item	Parameters	Description
<b>Hardware (Read-only)</b>	HW Status	OK	Indicates the status of the hardware
		FPGA load invalid	
		Incomp I/O Module	
		Current out of spec	
		Internal Error	
	Voltage (mV)	#	Supply Voltage
	Current (mA)	#	Current consumption of card
	CPU headroom	#	Processing power available

**Table 4.2 Hardware Tab Items**

Tab Title	Item	Parameters	Description
<b>Hardware (Read-only)</b>	RAM available	###	On-board processing memory available
	Uptime (h)	#	Displays the number of hours since the last restart of the card
	Configuration Bank	#	Storage count

## Product Tab

Table 4.3 summarizes the **Product** tab parameters available in DashBoard for the SPG-8260.

**Table 4.3 Product Tab Items**

Tab Title	Item	Parameters	Description
<b>Product (Read-only)</b>	Product	SPG-8260	
	Supplier	Ross Video Ltd.	
	Board Rev	##	Indicates the board version
	Board S/N	#####	Indicates the board serial number
	Rear Module	#	Type of rear module in the slot
	Firmware Rev	###	Indicates the firmware version
	Software Rev	###	Indicates the software version

## Setup Menus

Table 4.4 summarizes the **Setup Menu** options available in DashBoard for the SPG-8260.

**Table 4.4 Setup Menu Items**

Menu Title	Item	Parameters	Description
<b>Setup</b>	Reference	Frame 1*	Selects the reference source
		Frame 2	
		Local	
		Internal	
	Reference Format (read-only)	#	Indicates the reference format
Reference Rate	# (read-only)	This field is read-only when the card is using Frame 1, Frame 2, or BNC 9 as the reference source	
	#	This field is editable when the card is using the internal reference (selected or because a valid reference source on the frame or the local reference is unavailable), or is using an AES source or Word Clock for the reference source	

**Table 4.4 Setup Menu Items**

Menu Title	Item	Parameters	Description
Video Outputs - Output #	Format	NTSC Black	Selects the video format of the output signal
		NTSC Color Bars	
		PAL Black	
		PAL Color Bars	
		1080i 59.94	
		1080i 50	
		720p 59.94	
		720p 50	
		1080i 60	
		1080p 30	
		1080p 29.97	
		1080p 25	
		1080p 24	
		1080p 23.98	
		1080pSF 24	
		1080pSF 23.98	
		720p 60	
	720p 30		
	720p 29.97		
	720p 25		
	720p 24		
720p 23.98			
Horizontal Delay (pixel)	0* to # <sup>a</sup>	Delay set in pixels <sup>b</sup>	
Vertical Delay (lines)	0* to # <sup>a</sup>	Delay set in lines	
Output Compatibility (read-only)	Genlock	The output video is locked in time to the reference where a Line 1 of output is aligned with Line 1 of the reference	
	Field Lock	The output video is locked in time to the reference where the first line of either Field 1 or Field 2 in the output video is aligned with Line 1 of the reference	
	Clock Lock	The interface sampling clock of the output video is locked in time to the reference interface sampling clock	
	Incompatible <sup>c</sup>	The reference format does not support the video output format and the output format timing may be invalid	

**Table 4.4 Setup Menu Items**

Menu Title	Item	Parameters	Description
Audio Output	Audio Output Format	Off	Disables the audio output on BNC 10 (8310AR-030 and 8320AR-030 rear modules); for the 8320AR-031 Rear Module, on BNC 9 or BNC 10
		AES*	Outputs an AES signal at 48kHz
		Word Clock	Left/right clock is being output (word clock)
	Audio Output Co-Timing	Video Output 1*	Selects the channel the audio output will follow
		Video Output 2	
		Video Output 3	
		Video Output 4	
	AES Level (dBFS)	-40 to 0*	Adjusts the gain of the audio output for both channels
	AES Tone	Mute*	Assigns the AES tone for both channels
		#Hz	
#kHz			
Setup	Edit permission	Unlocked*	All menu options are unlocked and can be edited
		Locked	All menu items, except this one, are locked and read-only
	Factory Defaults	Reset	Resets all parameters to factory defaults

- a. The maximum value depends on the selected output format.
- b. The precision of the Horizontal Delay after reset or power-up is +/- 1 pixel.
- c. The following errors are occurring: the horizontal and/or vertical timing is not locked to your reference, and the frame rate is invalid. Note that the frame rate will not be the value specified in the **Format** menu.

## Alarm Menus

Table 4.5 summarizes the Alarm Menu options available in DashBoard for the SPG-8260.

**Table 4.5 Alarm Menu Items**

Menu Title	Item	Parameters	Description
Alarm	Reference Alarm	Checkbox enabled*	Updates the <b>Reference Status</b> field in the <b>Signal</b> tab when a reference error occurs
		Checkbox disabled	Disables this feature
	Color Burst Detection	Checkbox enabled*	Updates the <b>Reference Status</b> field in the <b>Signal</b> tab when the card is using a NTSC or PAL reference signal that does not include a valid color burst
		Checkbox disabled	Disables this feature
	Video Output Compatibility - Output #	Checkbox enabled*	Updates the <b>Video Output Status</b> field, for the specified output, when a change in output status occurs
		Checkbox disabled	Disables this feature



# Card-edge Menu System

This section summarizes the Card-edge Menu system of the SPG-8260 and how to navigate the menus and options using the **SW1** and **SW2** switches on the SPG-8260 card-edge.

## Navigation

Use the following procedure to navigate the card-edge menus of the SPG-8260:

1. Rotate **SW1** to the required menu.
2. Toggle **SW2** to select the required parameter.

This completes the procedure for navigating the card-edge menus of the SPG-8260.



**Note** — Do not power down the card before ensuring that all edited parameters are saved. Saving edited parameters can take up to 10 seconds.

## Card-edge Menus

**Table 4.6** lists all the menus and the default values available using the card-edge controls. To activate some of these parameters, it may be necessary to toggle **SW2** in either direction, or it may require that **SW2** be held in either direction for a few seconds.

**Table 4.6 Card-edge Menus and Items**

Menu Select	Card-Edge Menu Label	Menu Name	Item
0	SPG-8260 slot #	Home	
1	Ref Src	Reference Source	Frame 1*
			Frame 2
			Local
			Internal
2	Ref Rate	Reference Rate	59.94Hz*
			60Hz
			23.98Hz
			24Hz
			25Hz
			29.97Hz
			30Hz
50Hz			
3	Out Sel	Output Select	1
			2
			3
			4

**Table 4.6 Card-edge Menus and Items**

Menu Select	Card-Edge Menu Label	Menu Name	Item
4	Out Std	Output Standard	1080i 59.94 Hz*
			PAL Color Bars
			PAL Black
			NTSC Color Bars
			NTSC Black
			720p 23.98Hz
			720p 24Hz
			720p 25Hz
			720p 29.97Hz
			720p 30Hz
			720p 60Hz
			1080pSF 23.98Hz
			1080pSF 24Hz
			1080p 23.98Hz
			1080p 24Hz
			1080p 25Hz
			1080p 29.97Hz
			1080p 30Hz
			1080i 60Hz
			720p 50Hz
720p 59.94Hz			
1080i 50Hz			
5	Out V Dly	Output Vertical Delay	0*-1124 lines (1080i formats)
			0*-749 lines (720p formats)
			0*-624 lines (576 formats)
			0*-524 lines (480 formats)
6	Out H Dly	Output Horizontal Delay	0*-4124 (720p 24/23.98Hz)
			0*-3959 (720p 25Hz)
			0*-3299 (720p 30/29.97Hz)
			0*-2749 (1080p 24/23.98Hz, 1080pSF 24.23.98Hz)
			0*-2639 (1080i 50Hz, 1080p 25Hz)
			0*-2199 (1080i 60/59.94Hz, 1080p 30/29.97Hz)

**Table 4.6 Card-edge Menus and Items**

Menu Select	Card-Edge Menu Label	Menu Name	Item
6	Out H Dly	Output Horizontal Delay	0*-1979 (720p 50Hz)
			0*-1649 (720p 60/59.94 Hz)
			0*-863 (PAL B)
			0*-857 (NTSC)
7	Aud Out	Audio Output	Off
			AES*
			Word Clock
8	Aud Timing	Audio Output Co-Timing	Video Output 1*
			Video Output 2
			Video Output 3
			Video Output 4
9	AES Tone	AES Tone	Mute*
			4kHz
			2kHz
			1kHz
			500Hz
A	AES Level	AES Level	-40dBFS to 0dBFS (1dBFS increments) <sup>a</sup>
F	Fact Def	Factory Default	Pushing up or down on the toggle switch will reset the card to the factory default values

a. The default value is 0.

## Menu Descriptions

This section briefly summarizes the menu parameters available in the card-edge display.

### 0 — Home

This read-only menu displays the product name and the slot the card is installed in the frame.

### 1 — Reference Source

This menu enables you to select which reference to use. The choices are Frame Reference 1 (**Fr 1**), Frame Reference 2 (**Fr 2**), the BNC on the rear module (**Local**), and **Internal**.

### 2 — Reference Rate

This selects the internal reference field rate. This field is not used when the SPG-8260 is locked to an external reference.

### 3 — Output Select

This menu enables you to select the output to be configured. This menu is used in conjunction with Menus 4, 5, and 6.

## 4 — Output Standard

This menu enables you to select the format for the output selected in Menu 3.

## 5 — Output Vertical Delay

This menu enables you to add extra delay to the output video in line increments. This menu is used in conjunction with Menu 3.

## 6 — Output Horizontal Delay

This menu enables you to add delay to the output video in pixel increments. This menu is used in conjunction with Menu 3.

## 7 — Audio Output

This menu enables you to select the function of the audio output.

## 8 — Audio Output Co-Timing

This menu enables you to specify the video output the audio input will follow.

## 9 — AES Tone

This menu enables you to assign the tone for the AES output.

## A — AES Level

Use this menu to adjust the audio gain over a range of  $\pm 20$ dB in increments of 1dB.

## B, C, D, E, — Not Implemented

Menus B, C, D, and E are not implemented at this time.

## F — Factory Defaults

This function enables you to return all controls to their factory default values. Use the following procedure to reset the card parameters to factory default values using the card-edge controls:

1. Rotate **SW1** to **F**. The Four-Character Display displays “**Fact Def**”.
2. Toggle **SW2** up or down and hold for 3 seconds.
3. Release **SW2**.



---

**Note** — Holding the **Bootload** button for 3 seconds when on any menu other than **Factory Defaults**, resets that menu to the factory default value.

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# Specifications

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## In This Chapter

This chapter provides technical specifications for the SPG-8260. Note that specifications are subject to change without notice.

The following topics are discussed:

- Technical Specifications
- Channel Status Data

# Technical Specifications

This section provides technical information for the SPG-8260.

**Table 5.1 SPG-8260 Technical Specifications**

Category	Parameter	Specification
<b>Analog Video Output</b>	Standards Accommodated	SMPTE 274M, 296M, and 170M ITU-R BT.470-6 (PAL-B)
	Number of Channels	4
	Number of Outputs per Channel	2
	Signal Level	1Vp-p
	DC Offset	<50mV
	Output Impedance	75ohm
	Return Loss	>40dB to 30MHz
	Free Run Frequency	1ppm initial (4.6ppm 10 years, all conditions)
	Thermal Stability	±0.25ppm (0 to 70°C)
<b>AES / Word Clock Output</b>	Number of Outputs	2 (BNC 9 is not configured as a reference input) 1 (BNC 9 is configured as a reference input)
	Connector	BNC
	Output Impedance	75ohm
	Signal Level	1Vp-p
	Return Loss	>25dB to 10MHz
	Sample Rate (AES Output)	48kHz
<b>Reference Input<sup>a</sup></b>	Number of Inputs	1
	Connector	BNC
	Input Impedance	75ohm
	Return Loss	>40dB to 10MHz
	Minimum Input (AES/Word Clock)	100mVp-p
	Maximum Input (AES/Word Clock)	4Vp-p
	Sample Rate (AES Input)	48kHz
	Standards Accommodated (Reference Input)	SMPTE 274M, 296M, and 170M ITU-R BT.470-6 (PAL-B)
	Signal Level (Reference Input)	1Vp-p
<b>Environmental</b>	Operating Range	5°C to 40°C ambient
<b>Power</b>	Total Power Consumption	6W

a. This can be BNC 9 or BNC 10 depending on the rear module you are using.

## Channel Status Data

Table 5.2 shows the channel status bit information that is used for all output audio.

**Table 5.2 Channel Status Data**

Byte	Bit	Function	Transmitted
0	0	Professional or Consumer use of Channel Status Block	Professional (1)
	1	Normal Audio or Non-Audio Mode	Normal Audio (0)
	2-4	Emphasis	No Emphasis (100)
	5	Lock Indication	Not Indicated (0)
	6-7	Sampling Rate	48kHz (01)
1	0-3	Channel Mode	Two channel mode (0001)
	4-7	User Bit Mode	192-bit (0001)
2	0-2	Auxiliary Bit Usage	24-bit audio sample, Aux bits audio (001)
	3-5	Sample Word Length	24-bits (101)
	6-7	Alignment Level	Not Indicated (00)
3	0-7	Multi-channel Modes	Undefined (0)
4	0-1	Digital Audio Reference Signal	Not a Reference (0)
	2	Reserved	0
	3-6	Sampling Frequency	Not Indicated (0000)
	7	Sampling Frequency Scaling Flag	No Scaling (0)
5	0-7	Reserved	Unused (0)
6-9		ASCII Source ID	Unused (0)
10-13		ASCII Destination ID	Unused (0)
14-17		Local Sample Address	Unused (0)
18-21		Time of Day	Unused (0)
22	0-7	C Data Reliability	All Status Bytes are marked as Reliable
23	0-7	CRC	Calculated CRC





# Service Information

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## In This Chapter

This chapter contains the following sections:

- Troubleshooting Checklist
- Warranty and Repair Policy

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# Troubleshooting Checklist

Routine maintenance to this openGear product is not required. In the event of problems with your SPG-8260, 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. **Input Signal Status** — Verify that source equipment is operating correctly and that a valid signal is being supplied.
4. **Output Signal Path** — Verify that destination equipment is operating correctly and receiving a valid signal.
5. **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.

## Bootload Button

In the unlikely event of a complete card failure, you may be instructed by a Ross Technical Support specialist to perform a complete software reload on the SPG-8260.



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**Note** — *When the SPG-8260 is running, pressing and holding the **Bootload** button for 3 seconds will reset the parameters selected by the card-edge controls to the default values.*

---

Use the following procedure to reload the software on a SPG-8260:

1. Eject the card from the frame.
2. Press and hold the **Bootload** button, while re-inserting the card into the frame. During power-up, if this button is held down, the **POWER** LED will start to flash and the SPG-8260 waits for a new software load.
  - During power-up, if this button is held down, the **POWER** LED starts to flash and the SPG-8260 waits for a new software load.
  - When the SPG-8260 is running, pressing and holding the **Bootload** button for 3 seconds resets the parameters selected by the card-edge controls to the default values.
3. Release the button.
  - If a new software load is not sent to the card within 60 seconds, the card will attempt to restart with its last operational software load.
  - Software loads can be sent to the SPG-8260 via the connection on the rear of the frame.

This completes the procedure for reload the software on a SPG-8260.

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## Warranty and Repair Policy

The SPG-8260 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 SPG-8260 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 SPG-8260 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 SPG-8260 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 SPG-8260 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 SPG-8260, 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 SPG-8260. 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.

# 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

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

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