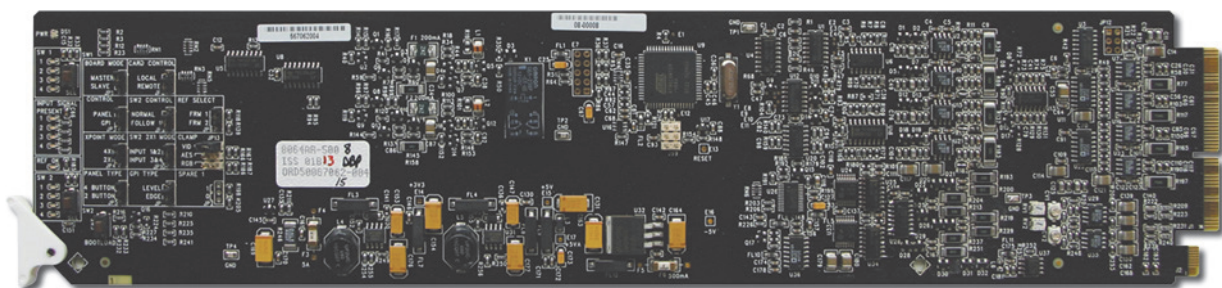


# AVS-8764

## AES/Analog Video Switch User Manual



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1. Provide a Superior Customer Experience
  - offer the best product quality and support
2. Make Cool Practical Technology
  - 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](mailto:solutions@rossvideo.com).

A handwritten signature in black ink that reads "David Ross". The signature is stylized, with the first letters of the first and last names being capitalized and prominent.

David Ross  
CEO, Ross Video  
[dross@rossvideo.com](mailto:dross@rossvideo.com)

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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.)*

# AVS-8764 · User Manual

- Ross Part Number: 8764DR-004-04
- Release Date: January 25, 2018.

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

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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.

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## 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](mailto: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<br>(업무용 방송통신기자재)                                                   | 이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.                                                                                                                       |
| Class A Equipment<br>(Industrial Broadcasting & Communication Equipment) | This equipment is <b>Industrial (Class A) electromagnetic wave suitability equipment</b> and seller or user should take notice of it, and this equipment is to be used in the places except for home. |

#### International

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

---

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

---

## Maintenance/User Serviceable Parts

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

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

## Environmental Information

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

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

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



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

## Company Address



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# Introduction

---

## In This Chapter

This chapter contains the following sections:

- Overview
- Functional Block Diagrams
- User Interfaces
- Documentation Terms and Conventions

## A Word of Thanks

Congratulations on choosing an openGear AVS-8764 AES/Analog Video Switch. 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 AVS-8764, 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 AVS-8764 AES/Analog Video Switch provides a convenient and economical solution when systems require switching of analog video or digital AES/EBU audio.

Each card has 4 inputs and two 4x1 crosspoints. Each output is available on two BNCs. The card can be configured for 7x1, 4x2, 4x1, Dual 2x1 or 2x1 operation.

Each switch is controlled by an optional control module (RMC-8120 or RMC-8120-1) or by GPI contact or logic level. All switching is done in the vertical interval based on composite sync switch timing, timed to an external analog reference. The AVS-8764 can use either of the two frame references that are distributed to all cards in the openGear frame. The appropriate switching line is automatically determined by the reference frame rate (50Hz or 59.94Hz). The last input selected for each output is stored in non-volatile memory for power failure protection.

LEDs are provided to indicate input and reference signal presence, and to show which input source is selected for each output.



---

**Note** — *Support for tri-level sync switch inputs is not implemented at this time.*

---

The AVS-8764 is fully compliant with all openGear technical specifications and supports remote monitoring via DashBoard.

## Features

The following features make the AVS-8764 the best solution for AES/Video switching:

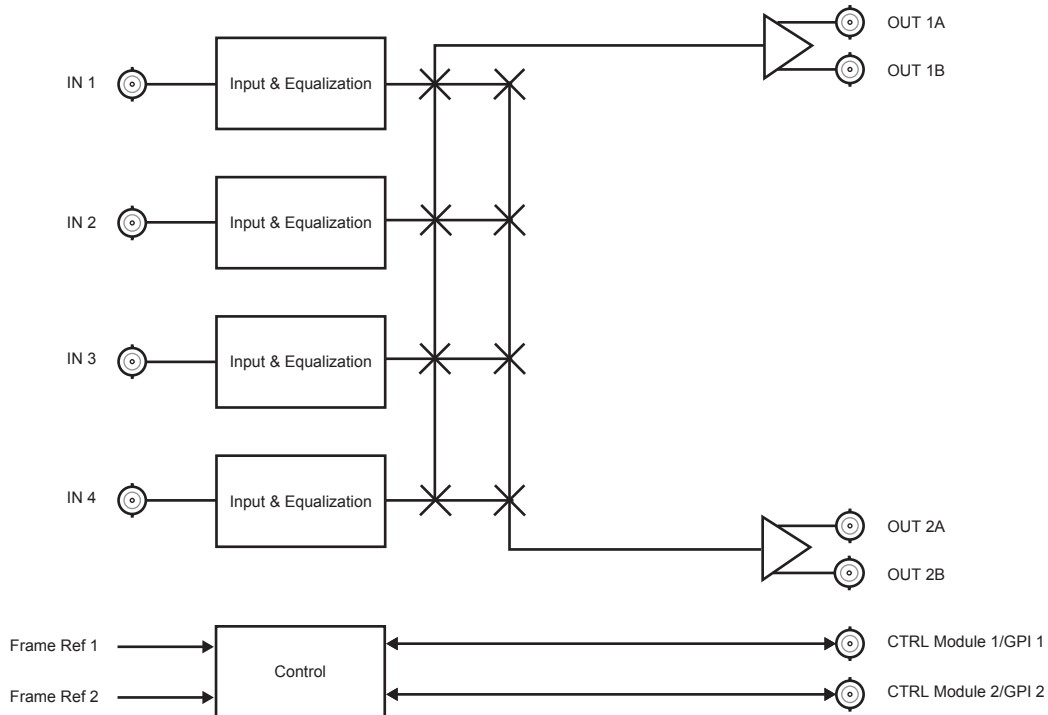
- Switches analog video or AES/EBU digital audio (per SMPTE 276M)
- Can also be used with component video
- 4 inputs
- 4 outputs (2 per switch)
- Can be configured as a 7x1<sup>1</sup>, 4x2, 4x1, 2x1 or Dual 2x1 switch
- Controllable by the RMC-8120 module or GPIs
- Switch selections are saved to non-volatile memory
- Vertical interval switching compliant with SMPTE RP168-2002
- All switching done in the vertical interval
- Economical cost per switch
- Indicators for input signal presence and reference
- Fully compliant with openGear specifications
- 5-year transferable warranty

---

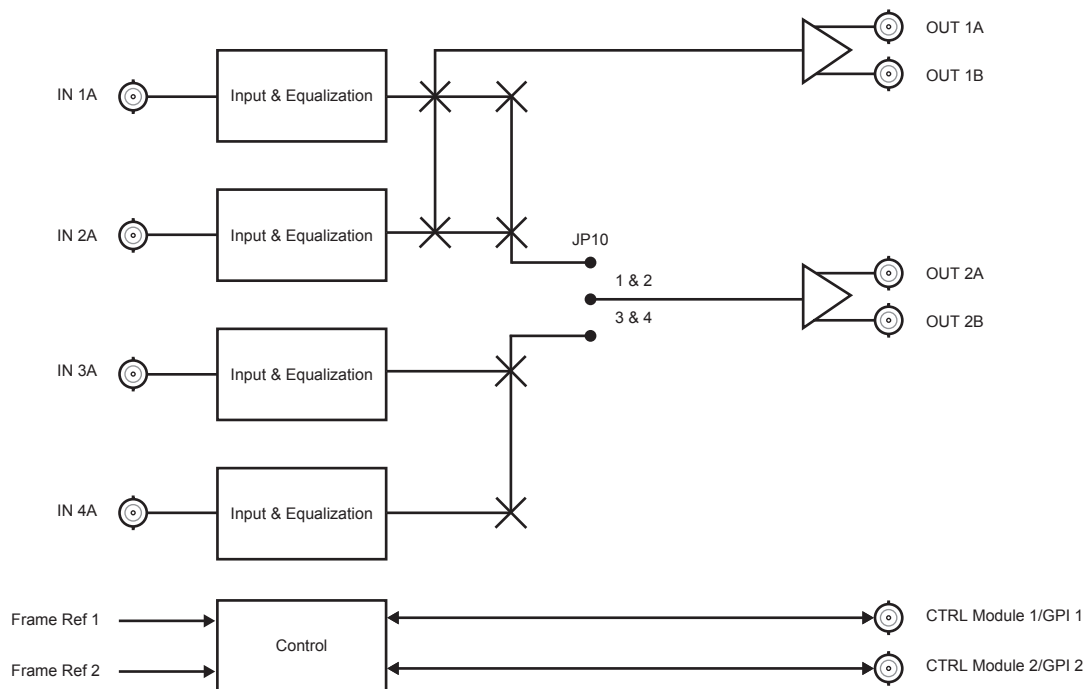
1. Requires two AVS-8764 cards.

# Functional Block Diagrams

This section provides a functional block diagram that outlines the workflow of the AVS-8764.



**Figure 1.1** Simplified Block Diagram — AVS-8764 in 4x2 Mode



**Figure 1.2** Simplified Block Diagram — AVS-8764 in Dual 2x1 Mode

---

# User Interfaces

The following interfaces are available for control and monitoring of your AVS-8764.

## DashBoard Control System

DashBoard enables you to monitor and control openGear frames and cards from a computer. DashBoard communicates with other cards in the openGear frame through the Network Controller card.

***For More Information on...***

- the menus in DashBoard, refer to the section “**DashBoard Menus**” on page 5-1.
- installing and using DashBoard, refer to the *DashBoard User Manual*.

## Card-edge Monitoring

The card-edges provide LEDs for monitoring the power, video input status and communication activity.

***For More Information on...***

- the card-edge LEDs, refer to the section “**Control and Monitoring Features**” on page 3-9.

## SNMP Monitoring and Control

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

***For More Information on...***

- SNMP controls on your card, refer to your AVS-8764 Management Information Base (MIB) file.
- SNMP Monitoring and Control, refer to your *MFC-8300 Series* or *MFC-OG3 Series User Manual*.

---

# Documentation Terms and Conventions

The following terms and conventions are used throughout this manual.

## Terms

The following terms are used:

- “**Board**”, and “**Card**” refer to openGear terminal devices within openGear frames, including all components and switches.
- “**DashBoard**” refers to the DashBoard Control System.
- “**DFR-8300 series frame**” refers to all versions of the 10-slot (DFR-8310 series) and 20-slot (DFR-8321 series) frames and any available options unless otherwise noted.
- “**openGear frame**” refers to DFR-8300 series and OG3-FR series frames that house the AVS-8764 card, as well as any openGear frames.
- “**Operator**” and “**User**” refer to the person who uses AVS-8764.
- “**System**” and “**Video system**” refer to the mix of interconnected production and terminal equipment in your environment.

## Conventions

The following conventions are used:

- The “**Operating Tips**” 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 Module(s) for the AVS-8764, installing the card into the frame, cabling details, and updating the card software.

The following topics are discussed:

- Before You Begin
- Installing the AVS-8764
- Cabling for the AVS-8764
- Software Upgrades

---

# 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 AVS-8764 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 AVS-8764

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

## Rear Modules for the AVS-8764

The Rear Module for the AVS-8764 depends on the frame you are installing the card into, and the configuration you want to set up.

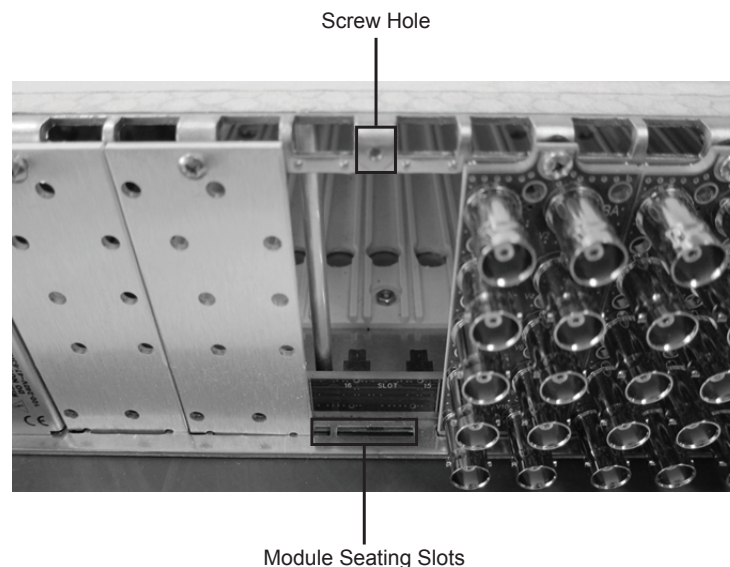
- **DFR-8310 series frame** — The 8310AR-030 Rear Module or the **8310AR-034** Rear Module can be used.
- **DFR-8321 series and OG3-FR series frames** — The 8320AR-030 Full Rear Module, the 8320AR-034 Full Rear Module, or the 8320AR-031 Split Rear Module can be used. Note that the available cable designations differ between the type of module used. Refer to the section “**DFR-8321 Series and OG3-FR Series Frame Cabling**” on page 2-5 for details.

## Installing a Rear Module

If you are installing the AVS-8764 in a DFR-8310-BNC frame, or the Rear Module is already installed, proceed to the section “**Installing the AVS-8764**” on page 2-4.

### 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 AVS-8764 installation. If there is no Blank Plate installed, proceed to the next step.
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 an OG3-FR Series Frame (AVS-8764 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.

## Installing the AVS-8764

This section outlines how to install the AVS-8764 in an openGear frame. If the AVS-8764 is to be installed in any compatible frame other than a Ross Video product, refer to the frame manufacturer's manual for specific instructions.

### To install the AVS-8764 in an openGear frame

1. Locate the Rear Module you installed in the procedure “**Installing a Rear Module**” on page 2-3.



---

**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.*

---

2. Hold the AVS-8764 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 the wax sheet before applying the label in order that the label can be affixed to the rear module surface.
5. Affix the supplied Rear Module Label to the rear module face.

---

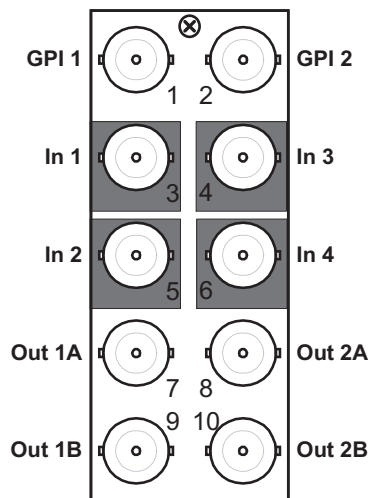
# Cabling for the AVS-8764

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

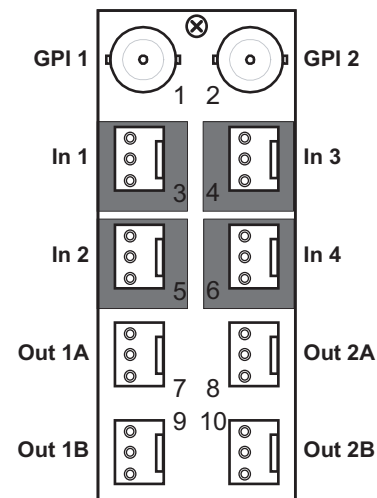
## DFR-8310 Series Frame Cabling

In the DFR-8310 series frames, you must use one of the following rear modules:

- **8310AR-030 Rear Module** — When using this module, connect the input and output cables according to **Figure 2.2**. The inputs are internally terminated in 75ohms. It is not necessary to terminate unused outputs.
- **8310AR-034 Rear Module** — This module includes two BNC connectors and eight AES connectors. When using this module, connect the input and output cables according to **Figure 2.3**. The inputs are internally terminated in 110ohms. It is not necessary to terminate unused outputs.



**Figure 2.2** Cable Connections for the 8310AR-030 and 8320AR-030 Rear Modules

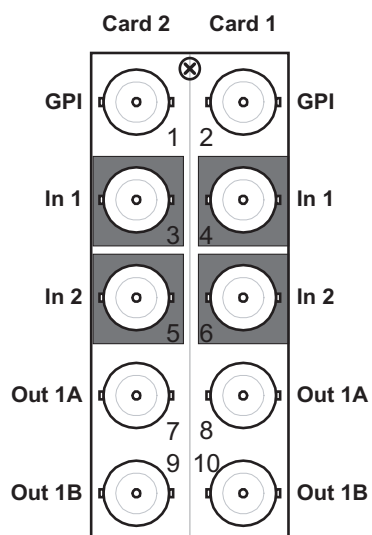


**Figure 2.3** Cable Connections for the 8310AR-034 and 8320AR-034 Rear Modules

## DFR-8321 Series and OG3-FR Series Frame Cabling

The AVS-8764 is used with the following Rear Modules:

- **8320AR-030 Full Rear Module** — Each rear module occupies two slots and accommodates one card. This rear module provides two GPI ports, four inputs, and four outputs. All connections use BNCs. (Figure 2.2)
- **8320AR-034 Full Rear Module** — Each rear module occupies two slots and accommodates one card. This rear module includes two BNC and eight AES connectors. (Figure 2.3)
- **8320AR-031 Split Rear Module** — Each rear module occupies two slots and accommodates two cards. This rear module includes two inputs, and two outputs per card. (Figure 2.4)



**Figure 2.4** Cable Connections for the 8320AR-031 Rear Module

---

# Software Upgrades

This section provides instructions for upgrading the software for your AVS-8764 using DashBoard. This section assumes you are running DashBoard version 3.0.0 or higher.

## To upgrade the software for the AVS-8764

1. Contact Ross Technical Support for the latest software version file.
2. Display the **Device View** of the card by double-clicking its status indicator in the **Basic Tree View**.
3. From the **Device View**, click **Upload** to display the **Select file for upload** dialog.
4. Navigate to the \*.bin upload file you wish to upload.
5. Click **Open**.
6. If you are upgrading a single card, click **Finish** to start the upgrade. Proceed to step 8.
7. If you are upgrading multiple cards:
  - Click **Next >** to display the **Select Destination** menu. This menu provides a list of the compatible cards based on the card selected in step 2.
  - Specify the card(s) to upload the file to by selecting the check box(es) for the cards you wish to upload the file to.
  - Verify that the card(s) you wish to upload the file to. The **Error/Warning** fields indicate any errors, such as incompatible software or card type mismatch.
  - Click **Finish**.
8. Monitor the upgrade.
  - The **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.



---

**Operating Tip** — *If you are running DashBoard version 2.3 or lower, you must click **Reboot** in the **Device** tab to complete the upgrade process.*

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# User Controls

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## In This Chapter

This chapter provides a general overview of the user controls available on the AVS-8764.

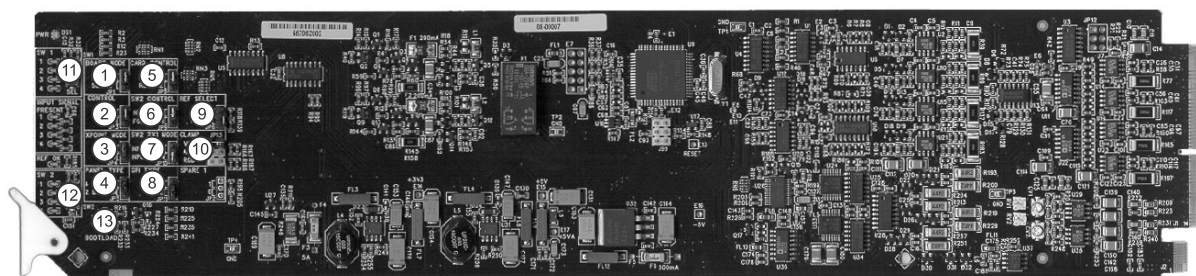
The following topics are discussed:

- Card Overview
- Control Modes
- Operation Modes
- Selecting the Timing
- Clamp Setup
- Control and Monitoring Features

# Card Overview

This section provides a general overview of the AVS-8764 components. The configurations outlined in this section should be performed before installing the card in the frame, but may be repeated as required. For information on the LEDs available on the card-edge, refer to the section “Control and Monitoring Features” on page 3-9.

Use the following discussions, the card labeling, and **Figure 3.1**, to set up AVS-8764 jumpers. These settings are performed before installing the unit in the frame, but may be repeated as required.



**Figure 3.1** AVS-8764 — Jumper Locations

|                              |                             |                                  |
|------------------------------|-----------------------------|----------------------------------|
| 1) Board Mode Jumper (JP1)   | 6) SW2 Control Jumper (JP9) | 11) Output 1 Select Button (SW1) |
| 2) Control Mode Jumper (JP3) | 7) 2x1 Mode Jumper (JP10)   | 12) Output 2 Select Button (SW2) |
| 3) Xpoint Mode Jumper (JP4)  | 8) GPI Type Jumper (JP11)   | 13) Bootload Button (SW3)        |
| 4) Panel Type Jumper (JP5)   | 9) REF Select Jumper (JP6)  |                                  |
| 5) Card Control Jumper (JP8) | 10) Clamp Jumper (JP13)     |                                  |

## 1. Board Mode Jumper (JP1)

**JP1** is used when the AVS-8764 is being controlled by an RCM-8120 or RCM-8120-1 module. One RCM module can control up to 10 switches (1 master, 9 slaves). The communication between the RCM-8120 and the card is controlled by the AVS-8764 that is configured as the Master card.

## 2. Control Mode Jumper (JP3)

**JP3** is used to tell the card if it will be controlled by an RCM module or by GPI, depending on the type of input control connected to the card on BNCs 1 and 2.

## 3. Xpoint Mode Jumper (JP4)

**JP4** is used to put the card in 4x1 or 2x1 mode.

## 4. Panel Type Jumper (JP5)

**JP5** is used to tell the card what type of control module is connected to it. This jumper is ignored when **JP3** is set to **GPI**.

## 5. Card Control Jumper (JP8)

**JP8** selects whether certain controls on the AVS-8764 are remotely configured using DashBoard, or using the card-edge controls. The following controls are available in DashBoard: 7x1 mode, Edit Permissions, Output 1 and 2 source, and Alarm notifications.

## 6. SW2 Control Jumper (JP9)

**JP9** configures the control mode for Output 2. The default setting is **NORMAL**.



#### 7. **2x1 Mode Jumper (JP10)**

**JP10** configures which two inputs are available on Output 2, when operating in 2x1 mode. Note that **JP4** must be set to **2x1**.

#### 8. **GPI Type Jumper (JP11)**

**JP11** is used to specify if GPIs will be edge or level sensitive.

#### 9. **REF Select Jumper (JP6)**

**JP6** enables you to select a frame reference to be used to synchronize the AVS-8764.

#### 10. **Clamp Jumper (JP13)**

**JP13** enables you to feed a reference voltage to the four input amps. The input amps use this reference voltage to provide a DC Restore that uses sync tip clamping. The DC Restore may be set for composite video, AES/EBU audio, or RGB video. Note that sync tip clamping is not available with tri-level sync inputs.

#### 11. **Output 1 Select Button (SW1)**

**SW1** selects the next input on Output 1. This button is used in conjunction with **JP4**.

#### 12. **Output 2 Select Button (SW2)**

**SW2** selects the next input on Output 2. This button is used in conjunction with **JP4**.

#### 13. **Bootload Button (SW3)**

This button is used for factory service in the unlikely event of a complete card failure. Do not press this button unless instructed to do so by Ross Technical Support.

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

- the LEDs available on the card-edge, refer to the section “**Control and Monitoring Features**” on page 3-9.
- the control mode for the AVS-8764, refer to the section “**Control Modes**” on page 3-4.
- the operating modes for the AVS-8764, refer to the section “**Operation Modes**” on page 3-5.
- the switch timing of the AVS-8764, refer to the section “**Selecting the Timing**” on page 3-7.
- the reclocking mode of the AVS-8764, refer to the section “**Operation Modes**” on page 3-5.
- the Bootload process, refer to the section “**Bootload Button**” on page 7-2.

---

# Control Modes

This section outlines how to set up your AVS-8764 by configuring the card for remote control, selecting the control mode, configuring the switch timing, and selecting the GPI type.

## Configuring Card Control

Use the following procedure to specify the card control mode:

1. Set **JP8** as follows:
  - **LOCAL** — The AVS-8764 can be controlled using the card-edge controls, with changes reflected in the DashBoard interface. This setting disables DashBoard Control System controls.
  - **REMOTE** — The AVS-8764 can be controlled through DashBoard Control System. Note that the control panel and card-edge controls are still available. This setting enables DashBoard Control System control of the following menus: 7x1 mode, Edit Permissions, Output 1 and 2 Source, and Alarms notifications.

## Selecting the Control Mode

The AVS-8764 is controlled by a GPI or the RCM-8120 or RCM-8120-1 remote control panels. Use **JP1**, **JP3**, **JP5**, **JP8**, and **JP11** in conjunction to select the control modes used for the AVS-8764.

### To select the Control Panel Control Mode

1. Set **JP3** to **PANEL** to enable one or two RCM-810 remote control modules to control the input selection.
2. Set **JP1** as follows:
  - **MASTER** — Use this setting to designate the AVS-8764 as a Master card in a multiple card configuration. Only one card, in a multiple card configuration, can be designated as a Master card. This is the default setting for single card configuration.
  - **SLAVE** — Use this setting to designate the AVS-8764 as a Slave card.
3. Set **JP5** as follows:
  - **4 BUTTON** — Select this option if the AVS-8764 is connected to a four-button RCM-8120 control module. This is the default setting.
  - **2 BUTTON** — Select this option if the AVS-8764 is connected to a two-button RCM-8120-1 control module.

### To select the GPI Control Mode

1. Set **JP3** to **GPI** to enable a GPI to control the input selection.
2. Set **JP11** as follows:
  - **LEVEL** — Select this option if the input selection is determined via GPI Levels on BNC 7 and BNC 8. This is the default setting.
  - **EDGE** — Select this option if the input selection is determined by high-to-low GPI transitions.

---

# Operation Modes

The AVS-8764 can be configured for any of the following operating modes:

- 4x1 switch
- 4x2 switch
- Dual 2x1 switch with input selection for each output
- Dual 2x1 switch with tracking, where Output 2 tracks Output 1
- 7x1 switch

Use **JP4**, **JP9**, and **JP10** in conjunction to configure the operating modes of the AVS-8764. These jumpers are used in conjunction to select the Crosspoint Mode of the card, select the control mode for Output 2, and designate the inputs for Output 2 when operating in 2x1 mode.



---

**Note** — When in **Dual 2x1 Mode**, there is an option in DashBoard to enable an Auto Change Over (ACO) Mode. This option is disabled in the 4x1 or 4x2 Modes. The card-edge controls, the panel input, GPI input, and remote control panel are all disabled when ACO Mode is enabled. For more information, refer to the section “Auto Change Over (ACO) Mode” on page 3-6.

---

## Configuring the Operating Mode

Use the following procedure to configure the operating mode of the AVS-8764:

1. Set **JP4** as follows:
  - **4x1** — The card operates as a 4x1 switch with four inputs selectable on each output. This is the default setting.
  - **2x1** — The card operates as a 2x1 switch with two inputs selectable on each output.
2. Set **JP9** as follows:
  - **NORMAL** — Output 2 is controlled independently by the SW2 card-edge controls, the control module, or the GPI on BNC 2. This is the default setting.
  - **FOLLOW1** — Output 2 settings follow Output 1. Switching Output 1 will also switch Output 2.
3. If **JP4** is set to **2x1**, set **JP10** as follows:
  - **INPUT 1&2** — Inputs 1 and 2 are available on Output 2. This is the default setting.
  - **INPUT 3&4** — Inputs 3 and 4 are available on Output 2.

## Configuring SW1 and SW2

**SW1** and **SW2** select the next inputs on Output 1 and Output 2 respectively.

### To configure SW1 and SW2

1. Set **JP3** to **PANEL**.
2. Set **JP1** to **MASTER**.
3. Configure the behavior of **SW1** by setting **JP4** as follows:
  - **4x1** — Select this option to have **SW1** cycle through inputs 1 through 4.
  - **2x1** — Select this option to have **SW1** cycle between inputs 1 and 2.

4. Configure the behavior of **SW2** as follows:
  - Set **JP9** to **NORMAL**.
  - Set **JP4** as follows:
    - › **4x1** — Select this option to have **SW2** cycle through inputs 1 through 4.
    - › **2x1** — Select this option to have **SW2** cycle based on the **JP10** settings.
  - If **JP4** is set to **2x1**, set **JP10** as follows:
    - › **INPUT 1&2** — Select this option to have **SW2** cycle through inputs 1 and 2.
    - › **INPUT 3&4** — Select this option to have **SW2** cycle through inputs 3 and 4.

## Auto Change Over (ACO) Mode

When the AVS-8764 is configured for **Dual 2x1** mode, there is an option to enable the **Auto Change Over (ACO)** mode. During ACO Mode, a Loss of Signal (LOS) on the primary input will cause the output to switch to the secondary input. Once the output is switched, the card will check the presence of the primary input to return. When the primary input has returned for 30 seconds, the output will switch back. DashBoard enables you to configure the trigger for the ACO Mode when operating in Dual 2x1 mode. If you are operating in 4x2 or 4x1 modes, the ACO Trigger is automatically set to Loss of Signal. For information on the available options for the ACO Trigger, refer to the section “**Remote Control Tab**” on page 5-5.

## 7x1 Mode Setup

This section outlines how to configure the jumpers on the AVS-8764 cards for operating in 7x1 mode, and enabling the mode on the downstream card. Note that only the downstream, or Master, card is enabled for 7x1 operation.

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

- operating in 7x1 mode, refer to the section “**7x1 Mode**” on page 4-4.
- possible 7x1 configurations, refer to **Figure 4.3** and **Figure 4.4**.

### To configure the AVS-8764 for 7x1 mode

1. Set **JP1** to **SLAVE** on the upstream AVS-8764 card.
2. Set **JP1** to **MASTER** on the downstream AVS-8764 card.
3. Set **JP3** to **PANEL** on both cards.
4. Set **JP4** to **4x1** on both cards.
5. Set **JP5** to **4 Button** on both cards.

### To enabling 7x1 mode for the downstream or master card

1. In DashBoard, display the **Device View** of the AVS-8764 by double-clicking its status indicator in the **Basic Tree View**.
2. Select the **Setup** tab from the **Device View**.
3. To enable 7x1 mode, select the **7x1 Mode** check box.

---

## Selecting the Timing

The openGear frames accept two external analog references which are distributed to all the cards installed in the frame. Either of these references can be used to synchronize the AVS-8764.

The AVS-8764 will switch on the vertical interval when provided with an analog reference. The switching line is determined via the frame rate (50Hz or 59.94Hz) and the data rate. The AVS-8764 can switch without an analog reference, but the switch timing will be random.

### To configure the switch timing of the AVS-8764

1. Set **JP6** as follows:

- **FRM 1** — Selects the source connected to the **REF 1** port on the back of the frame. This is the default setting.
- **FRM 2** — Selects the source connected to the **REF 2** port on the back of the frame.

---

## Clamp Setup

**JP13** enables you to feed a reference voltage to the four input amps. The input amps use this reference voltage to provide a DC Restore that uses sync tip clamping. The DC Restore may be set for composite video, AES/EBU audio, or RGB video. This feature is not available for tri-level sync video signals.



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**Note** — *JP13 has no effect if you are using balanced AES inputs.*

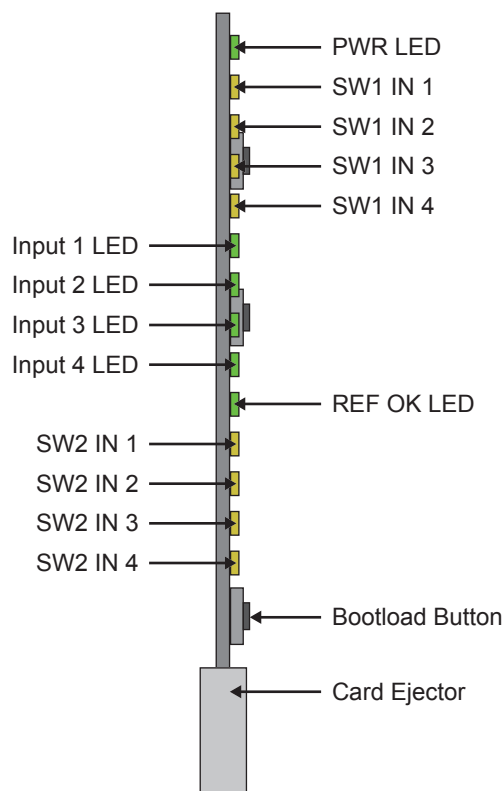
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### To set up the clamping feature

1. Set **JP13** as follows:
  - **VID** — Select this option for analog composite video, component video, or RGB video with sync. This is the default setting.
  - **AES** — Select this option for AES/EBU digital audio or the U, V, channels of component video.
  - **RGB** — Select this option for RGB video without sync.

# Control and Monitoring Features

This section describes the LEDs and buttons located on the front card-edge of the AVS-8764.



**Figure 3.2** AVS-8764 Card-edge Controls

## Status and Selection LEDs on the AVS-8764

Basic LED displays and descriptions are provided in **Table 3.1**.

**Table 3.1** LEDs on the AVS-8764

| LED      | Color           | Display and Description                                                                                                                                                                        |
|----------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PWR      | Green           | When lit green, this LED indicates the card is operating correctly.                                                                                                                            |
|          | Flashing Green  | When flashing green, this LED indicates that the card does not have a valid software load.                                                                                                     |
|          | Amber           | When lit amber, this LED indicates a hardware failure.                                                                                                                                         |
|          | Red             | When lit red, this LED indicates that the card is powering on.                                                                                                                                 |
|          | Off             | When unlit, this LED indicates a lack of power to the card.                                                                                                                                    |
| SW1 IN # | Yellow          | The four LEDs present in this area report which input is selected for Output 1. The LED for the selected input is illuminated yellow when selected. This input is routed to Outputs 1A and 1B. |
|          | Flashing Yellow | When flashing, these LEDs indicate the ACO Mode is enabled.                                                                                                                                    |

**Table 3.1 LEDs on the AVS-8764**

| LED             | Color           | Display and Description                                                                                                                                                                        |
|-----------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SW2 IN #</b> | Yellow          | The four LEDs present in this area report which input is selected for Output 2. The LED for the selected input is illuminated yellow when selected. This input is routed to Outputs 2A and 2B. |
|                 | Flashing Yellow | When flashing, these LEDs indicate the ACO Mode is enabled.                                                                                                                                    |
| <b>Input #</b>  | Green           | The four LEDs present in this area report signal presence on the specified input. Indicates a valid signal is present on the specified input.                                                  |
|                 | Off             | When unlit, an LED indicates that no valid signal is detected on the specified input.                                                                                                          |
| <b>REF OK</b>   | Green           | When lit green, this LED indicates that an analog reference is present, and locked.                                                                                                            |
|                 | Off             | When unlit, this LED indicates that the analog reference is not present, or not locked.                                                                                                        |



# Operation

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## In This Chapter

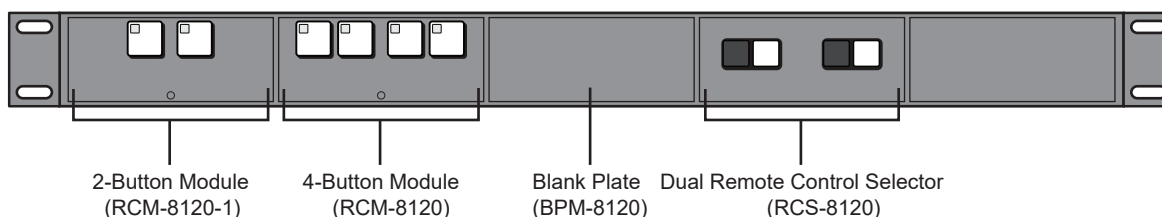
This chapter provides a detailed explanation of operating your AVS-8764 via GPI or remote panel.

The following topics are discussed:

- Overview
- Operating Modes with the RCM-8120 Control Modules
- Multiple Remote Module Operation
- GPI Switch Operation

# Overview

The AVS-8764 can be operated via remote control module. Each control module provides push buttons inserts with LED indicators. The following diagram shows a MRP-8120 Rackmount Control Panel with one of each type of remote control module.



**Figure 4.1** MRP-8120 Panel with RCM-8120-1, RCM-8120, and RCS-8120 Installed

Up to 10 cards can be controlled simultaneously by a single RCM-8120 control module (1 Master card, 9 Slave cards). Also, up to three control modules may be connected to a control bus. When multiple modules are connected to a control bus, selecting the active module is accomplished via a GPI connection on the back of each control module. Only one module can be active at a time, to avoid bus contention. Non-active modules will indicate the currently selected Output.

The control bus is a single coax cable. It originates at the Master card (BNC 1 for GPI 1, BNC 2 for GPI 2). The control bus provides both power and data communications to the remote modules. Female T-connectors may be used to split the coax at each card or module to loop the control bus to the next module. Remote modules may also be connected together via audio/control cable such as Belden 1503A audio/control cable (22 AWG shielded pair).

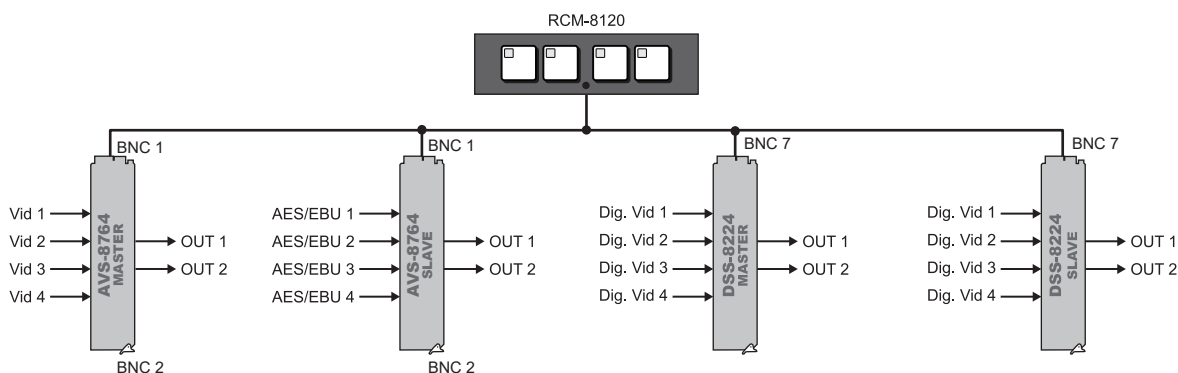


**Note** — GPI 1 (BNC 1) and GPI 2 (BNC 2) cannot be connected to the same control bus.

Remote modules may also be GPI controlled with closed contact or logic low (level or pulse). Four GPI terminals are provided on the back of each control module, one for each input. For more information, refer to the documentation for your RCM-8120.

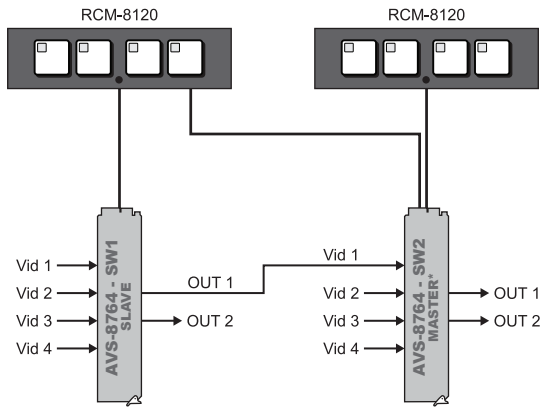
When operating the AVS-8764 with the control module, connecting multiple cards to the same bus allows you to switch multiple channels of SDI video, Analog video, AES, and Analog audio simultaneously.

**Figure 4.2** displays a common configuration using the AVS-8764 and DSS-8224 cards with an RCM-8120.



**Figure 4.2** Example of Signal Flow with 4x1 Operation

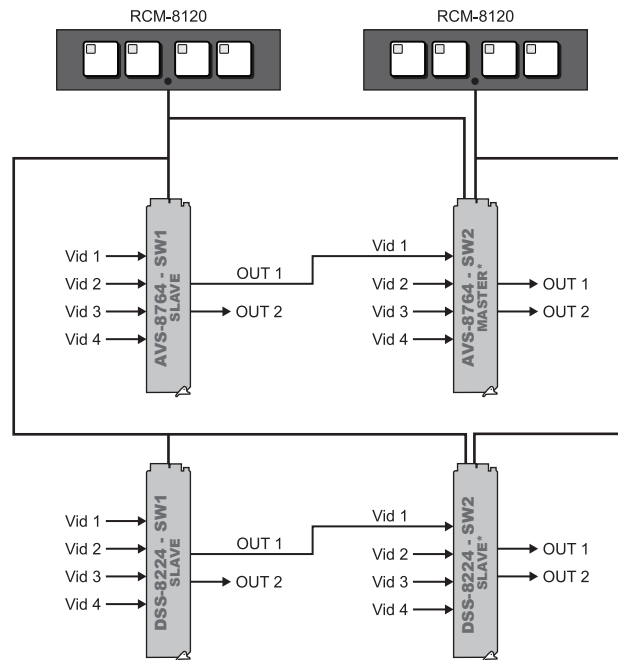
**Figure 4.3** displays a 7x1 configuration where two AVS-8764 cards are used. You must have two AVS-8764 cards with one configured as the Master. The Master card must be enabled for 7x1 operation.



\*Card is configured for 7x1 operation

**Figure 4.3** Example of Signal Flow with 7x1 Operation — Two AVS-8764

**Figure 4.4** displays a 7x1 configuration where two AVS-8764 cards and two DSS-8224 cards are used. Note that you must have one AVS-8764 card configured as the Master. This Master card must be enabled for 7x1 operation. One of the DSS-8224 cards must also be enabled for 7x1 operation.



\*Card is configured for 7x1 operation

**Figure 4.4** Example of Signal Flow with 7x1 Operation — Two AVS-8764 and Two DSS-8224

# Operating Modes with the RCM-8120 Control Modules

The AVS-8764 can be configured to operate in several different modes. The following table summarizes the modes supported on the AVS-8764 when controlled via the RCM-8120 or RCM-8120-1 control modules. Refer to the section “**Cabling for the AVS-8764**” on page 2-5 for cabling details.

**Table 4.1 Switch Operation Modes**

| Operating Mode        | JP4 | JP9    | JP10      | JP5                   | Modules Required | Description                                                                                                                                                                                                                                                                   |
|-----------------------|-----|--------|-----------|-----------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4x2 Panel             | 4x1 | NORMAL | n/a       | 4-button <sup>a</sup> | 2 x RCM-8120     | <ul style="list-style-type: none"> <li>Each output is controlled independently</li> <li>Each output can select inputs 1-4</li> </ul>                                                                                                                                          |
| 4x1 Panel             | 4x1 | FOLLOW | n/a       | 4-button <sup>a</sup> | 1 x RCM-8120     | <ul style="list-style-type: none"> <li>Output 1 can select inputs 1-4</li> <li>Output 2 tracks Output 1</li> </ul>                                                                                                                                                            |
| Dual 2x1 (1 panel)    | 2x1 | NORMAL | As needed | 4-button              | 1 x RCM-8120     | <ul style="list-style-type: none"> <li>Output 1 is controlled by buttons 1 and 2. Output 2 is controlled by buttons 3 and 4</li> <li>Output 1 can select between inputs 1 and 2, and Output 2 can be configured to select between inputs 1 and 2 or inputs 3 and 4</li> </ul> |
| Dual 2x1 (2 panels)   | 2x1 | NORMAL | As needed | 2-button              | 2 x RCM-8120-1   | <ul style="list-style-type: none"> <li>Each Output is controlled independently</li> <li>Output 1 can select between inputs 1 and 2</li> <li>Output 2 can be configured to select between inputs 1 and 2 or inputs 3 and 4</li> </ul>                                          |
| 2x1 Panel (2 outputs) | 2x1 | FOLLOW | As needed | 2-button <sup>b</sup> | 1 x RCM-8120-1   | <ul style="list-style-type: none"> <li>Output 1 can select between inputs 1 and 2. Output 2 tracks Output 1.</li> <li>Output 2 can be configured to select between inputs 1 and 2 or inputs 3 and 4</li> </ul>                                                                |

a. Can also use a 2-button panel, but could then only select inputs 1 and 2.

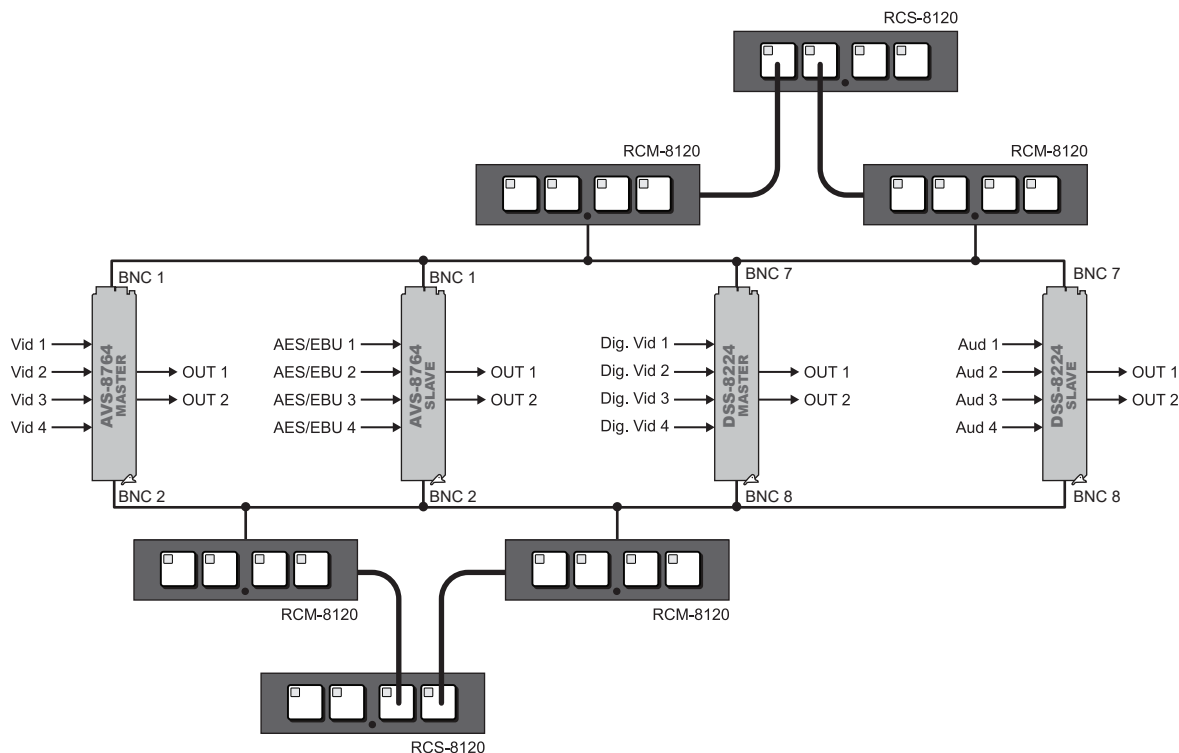
b. Can also use a 4-button panel, but buttons 3 and 4 will be inactive.

## 7x1 Mode

When the AVS-8764 is configured for 7x1 mode, two four-button panels are connected together with the two 7x1 switches. Note that Panel 1 connects to GPI 1 on both AVS-8764 cards. The upstream switch will have one panel connected in slave mode and will listen for button presses and changes the outputs accordingly. The downstream switch will have both panels connected in master mode. When a button press is detected on the panel this connected to the upstream switch, the downstream switch will change to Input 1 which originates from the upstream switch. This switch is delayed for approximately 1-2 fields in order to allow the upstream switch time to make the change. Refer to the section “**7x1 Mode Setup**” on page 3-6 for setup details.

## Multiple Remote Module Operation

Up to three control modules can be connected to a control bus. To avoid bus contention, only 1 module may be active at a time. Active modules have a red LED on the front of the panel lit up. Non-active modules will continue to indicate the currently selected Output. Pressing buttons on a non-active module will have no effect on the utility switch connected to the module.



**Figure 4.5** Example of Signal Flow with Multiple Module Operation

To select which module is active, a GPI must short the module GPI. On the back of each module is a three-pin connector for the GPI. Shorting pins 1 and 2 together, or bringing pin 1 to a low logic level, will enable the module.

In installations where two modules are connected to a control bus, the RCS-8120 may be connected to the 2 remote modules to select which module is active. The RCS-8120 has two dual push button switches, so one RCS-8120 can control four RCM-8120 modules.

---

# GPI Switch Operation

The following sections explain common configurations using GPI Level and GPI Edge controls. When configured in 2x1 Mode, the AVS-8764 can be controlled by the RCS-8120 Remote Control Module. This module has dual push-button switches for GPI triggering.

## GPI Level Operation

In GPI Level Mode, the card can work in two ways, as a 4x1 switch or as a Dual 2x1 switch. There are two GPI BNC connections (BNC 1 and BNC 2). The first input of each 2x1 switch is selected while the GPI input is open. A ground or low logic level will cause the second input to be selected.

GPIs are internally pulled up to +5 VDC. GPI shields can be tied together.

To control the card by GPI Level, use the following jumper configurations:

- **JP3** — Set this jumper to **GPI**. Input selection to be controlled by GPI.
- **JP11** — Set this jumper to **LEVEL**. Input selection to be determined via GPI levels on BNCs 1 and 2.

## 4x1 GPI Operation

If the card is configured as a 4x1 switch, the GPIs are binary encoded, and Output 2 tracks Output 1. Input selection is as follows:

**Table 4.2 Input Selection**

| GPI 1 | GPI 2 | Output 1 and 2 |
|-------|-------|----------------|
| Open  | Open  | Input 1        |
| Open  | Short | Input 2        |
| Short | Open  | Input 3        |
| Short | Short | Input 4        |

## Dual 2x1 Operation

If the card is configured as a Dual 2x1 switch, Output 1 is controlled by GPI 1. Output 2 can be controlled independently by GPI 2, or can track Output 1. Input selection for Output 1 is as follows:

- **GPI 1 Open** — Input 1
- **GPI 1 Short** — Input 2

## GPI Level Operating Modes

The following operating modes are available when using GPI Level control:

**Table 4.3 GPI Level Control Operation Modes**

| Operating Mode         | JP4 | JP9    | JP10      | Description                                                                                                                                                                                                                                                                   |
|------------------------|-----|--------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4x1 GPI                | 4x1 | n/a    | n/a       | <ul style="list-style-type: none"> <li>GPIs are binary encoded</li> <li>Output 1 can select inputs 1-4</li> <li>Output 2 tracks Output 1</li> </ul>                                                                                                                           |
| Dual 2x1 GPI           | 2x1 | NORMAL | As needed | <ul style="list-style-type: none"> <li>GPI 1 (BNC 1) controls Output 1</li> <li>GPI 2 (BNC 2) controls Output 2</li> <li>Output 1 can select between Inputs 1 and 2</li> <li>Output 2 can be configured to select between Inputs 1 and 2, or Inputs 3 and 4</li> </ul>        |
| Dual 2x1 GPI, Tracking | 2x1 | FOLLOW | As needed | <ul style="list-style-type: none"> <li>GPI 1 (BNC 1) controls Output 1 and Output 2</li> <li>GPI 2 (BNC 2) is not used</li> <li>Output 1 can select between Inputs 1 and 2</li> <li>Output 2 can be configured to select between Inputs 1 and 2, or Inputs 3 and 4</li> </ul> |

## GPI Edge Operation

Edge triggering looks for negative going edge on the GPI input. The pulse used must be at least 3 fields in duration (about 50 ms). Since a pulse is used, the best way to control equipment is with one dedicated GPI per crosspoint. This way the controlling equipment can always set the AVS-8764 to a known crosspoint. To do this, the AVS-8764 must be configured for edge triggered GPI mode as follows:

- **JP3** — Set this jumper to **GPI**. The Input selection is controlled by GPI.
- **JP11** — Set this jumper to **EDGE**. The Input selection is determined by high-to-low GPI transitions.

Since the AVS-8764 only has two GPI inputs, the card will only work in this mode when Switch 2 is set to Follow Switch 1 (**JP9** is set to **FOLLOW 1**). A negative going edge on GPI 1 (BNC 1) will select the first input, and a negative going edge on GPI 2 (BNC 2) will select the second input.

In this mode, the AVS-8764 operates as a 2x1 switch with both outputs controlled by GPI transitions on GPI 1 and 2. Output 1 can select Input 1 or 2 by toggling the following on GPI 1 and GPI 2:

- **Select Input 1** — Toggle GPI 1 low for 3 fields.
- **Select input 2** — Toggle GPI 2 low for 3 fields.

## 2x1 Edge Tracking Mode

For this mode, **JP10** must be set to **3&4**. You must also ensure that the GPIs are set as follows:

**Table 4.4 Dual 2x1 Edge GPI Tracking Mode Input Selection**

| GP 1 | GP 2 | OUT 1 A+B | OUT 2 A+B |
|------|------|-----------|-----------|
| ↓    |      | IN 1      | IN 3      |
|      | ↓    | IN 2      | IN 4      |

## 2x1 Edge GPI with 2 Outputs Mode

For this mode, **JP10** must be set to **1&2**. You must also ensure that the GPIs are set as follows:

**Table 4.5 Edge GPI Tracking Mode Input Selection**

| GP 1 | GP 2 | OUT 1 A+B | OUT 2 A+B |
|------|------|-----------|-----------|
| ↓    |      | IN 1      | IN 1      |
|      | ↓    | IN 2      | IN 2      |

## GPI Card Front-Edge Switch Control

When the AVS-8764 is configured for Panel/Master control or GPI Edge control, inputs can also be selected using the **SW1** and **SW2** buttons. Refer to the section “**AVS-8764 Card-edge Controls**” on page 3-9 for the location of these buttons on the card-edge.

Pressing the **SW1** button selects the next input for Output 1, with the following behaviors based on the operating mode of the card:

- **4x1 mode** — Cycles through Inputs 1 to 4.
- **2x1 mode** — Toggle between Inputs 1 and 2.

If Output 2 is configured to track Output 1, then Output 2 will track selections made using **SW1** and **SW2** is inactive.



# DashBoard Menus

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## In This Chapter

This chapter summarizes the menus, items, and parameters available from the DashBoard Control System for the AVS-8764. Parameters marked with an asterisk (\*) are the default values.



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**Note** — *AVS-8764 operational mode and source selection is not configurable from DashBoard at this time. Alarm reporting to DashBoard is configurable via the **Alarms Menu**.*

---

The following topics are discussed:

- Status Tabs
- Setup Tab
- Remote Control Tab
- Alarms Tab
- Jumpers Tab



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

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## Status Tabs

This section summarizes the read-only information displayed in the **Status** tabs. The fields in the **Status** tabs can vary in severity from green (valid), yellow (caution), to red (alarm). DashBoard reports the most severe alarm for a single field. Alarm colors are noted within the tables as text set in brackets next to the menu parameter name.

### Signal Tab

Table 5.1 summarizes the read-only information displayed in the **Signal** tab.

**Table 5.1 Signal Tab Items**

| Tab Title | Item            | Parameters        | Description                                         |
|-----------|-----------------|-------------------|-----------------------------------------------------|
| Signal    | Signal Status   | Green             | OK                                                  |
|           |                 | Yellow            | No reference detected                               |
|           | Reference       | Locked - 59.94 Hz | Indicates the status of the reference signal        |
|           |                 | Locked - 50 Hz    |                                                     |
|           |                 | No Signal         |                                                     |
|           | Input #         | Signal Present    | Signal present on specified input                   |
|           |                 | No Signal         | No signal present on specified input                |
|           | Output # Source | Input 1 (BNC 3)   | Indicates the input source for the specified output |
|           |                 | Input 2 (BNC 5)   |                                                     |
|           |                 | Input 3 (BNC 4)   |                                                     |
|           |                 | Input 4 (BNC 6)   |                                                     |
|           | Output # Status | Signal Present    | Signal present on the specified output              |
|           |                 | No Signal         | No signal present on the specified output           |

### Hardware Tab

Table 5.2 summarizes the read-only information displayed in the **Hardware** tab.

**Table 5.2 Hardware Tab Items**

| Tab Title | Item                  | Parameters | Description                          |
|-----------|-----------------------|------------|--------------------------------------|
| Hardware  | Voltage (mV)          | #          | Supply Voltage                       |
|           | Current (mA)          | #          | Current consumption of card          |
|           | CPU Headroom          | #          | Processing power available           |
|           | RAM Available (bytes) | ###        | On-board processing memory available |
|           | EE Bank               | #          | Storage count                        |

## Product Tab

Table 5.3 summarizes the read-only information displayed in the **Product** tab.

**Table 5.3 Product Tab Items**

| Tab Title      | Item          | Parameters      | Description                     |
|----------------|---------------|-----------------|---------------------------------|
| <b>Product</b> | Product       | AVS-8764        |                                 |
|                | Supplier      | Ross Video Ltd. |                                 |
|                | Board Rev     | ##              |                                 |
|                | Serial Number | #####           |                                 |
|                | Rear Module   | #               | Type of rear module in the slot |
|                | Software Rev  | ##.##           | Indicates the software version  |

---

## Setup Tab

**Table 5.4** summarizes the **Setup** options available in DashBoard.

**Table 5.4 Setup Menu Items**

| Tab Title | Item             | Parameters | Description                                                                           |
|-----------|------------------|------------|---------------------------------------------------------------------------------------|
| Setup     | 7x1 Mode         | Selected   | Enables 7x1 mode on the card. Note that only the downstream card needs to be enabled. |
|           |                  | Cleared*   | Disables this feature                                                                 |
|           | Edit Permission  | Unlocked*  | All menu options are unlocked                                                         |
|           |                  | Locked     | All menu items, except this one, are locked and read-only                             |
|           | Factory Defaults | Reset      | Resets parameters to factory defaults.                                                |

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## Remote Control Tab

The **Remote Control** menus are only available in DashBoard when the AVS-8764 is configured for Remote Control (**JP8** is set to **REMOTE**). The options available in the **Remote Control** tab depends on the mode that the AVS-8764 is operating in.

### 4x2 Mode

**Table 5.5** summarizes the **Remote Control Menu** options available in DashBoard when the AVS-8764 is operating in 4x2 Mode.

**Table 5.5 Remote Control Menu Items - 4X2 Mode**

| Tab Title                             | Item                           | Parameters | Description                                                                                                                                                            |
|---------------------------------------|--------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Remote Control (Read-only)            | Operating Mode                 | 4x2        | <ul style="list-style-type: none"><li>• Card is operating in 4x2 Mode</li><li>• <b>JP4</b> is set to <b>4x1</b></li><li>• <b>JP9</b> is set to <b>NORMAL</b></li></ul> |
| Auto Change Over Settings (Read-only) | Output 1 Auto Change Over Mode | Disabled   | ACO Mode is disabled                                                                                                                                                   |
|                                       | Output 2 Auto Change Over Mode | Disabled   | ACO Mode is disabled                                                                                                                                                   |
| Output Source Settings (Read-only)    | Output # Source                | Input 1    | BNC 3 is the output source                                                                                                                                             |
|                                       |                                | Input 2    | BNC 5 is the output source                                                                                                                                             |
|                                       |                                | Input 3    | BNC 4 is the output source                                                                                                                                             |
|                                       |                                | Input 4    | BNC 6 is the output source                                                                                                                                             |

### 4x1 Mode

**Table 5.6** summarizes the **Remote Control Menu** options available in DashBoard when the AVS-8764 is operating in 4x1 Mode.

**Table 5.6 Remote Control Menu Items - 4X1 Mode**

| Tab Title                             | Item                           | Parameters | Description                                                                                                                                                            |
|---------------------------------------|--------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Remote Control (Read-only)            | Operating Mode                 | 4x1        | <ul style="list-style-type: none"><li>• Card is operating in 4x1 Mode</li><li>• <b>JP4</b> is set to <b>4x1</b></li><li>• <b>JP9</b> is set to <b>FOLLOW</b></li></ul> |
| Auto Change Over Settings (Read-only) | Output 1 Auto Change Over Mode | Disabled   | ACO Mode is disabled                                                                                                                                                   |
|                                       | Output 2 Auto Change Over Mode | Disabled   | ACO Mode is disabled                                                                                                                                                   |
| Output Source Settings (Read-only)    | Output 1 Source                | Input 1    | BNC 3 is the output source                                                                                                                                             |
|                                       |                                | Input 2    | BNC 5 is the output source                                                                                                                                             |
|                                       |                                | Input 3    | BNC 4 is the output source                                                                                                                                             |
|                                       |                                | Input 4    | BNC 6 is the output source                                                                                                                                             |
|                                       | Output 2 Source                | Input #    | Displays the source of Output 2 (the same source as assigned to Output 1)                                                                                              |

## Dual 2x1 Mode

**Table 5.7** summarizes the **Remote Control Menu** options available in DashBoard when the AVS-8764 is operating in Dual 2x1 Mode.

**Table 5.7 Remote Control Menu Items - Dual 2X1 Mode**

| Tab Title                                 | Item                           | Parameters                                    | Description                                                                                                                                                               |
|-------------------------------------------|--------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Remote Control (Read-only)</b>         | Operating Mode                 | Dual 2x1, Two independent Outputs             | <ul style="list-style-type: none"> <li>Card is operating in Dual 2x1 Mode</li> <li><b>JP4</b> is set to <b>2x1</b></li> <li><b>JP9</b> is set to <b>NORMAL</b></li> </ul> |
| <b>Auto Change Over Settings</b>          | Output 1 Auto Change Over Mode | Disabled                                      | Disables the ACO Mode. User can assign any source for Output 1 from the <b>Output Source Settings</b> area.                                                               |
|                                           |                                | Enabled, Primary Source: Input 1 <sup>a</sup> | Assigns BNC 3 as the output source                                                                                                                                        |
|                                           |                                | Enabled, Primary Source: Input 2 <sup>a</sup> | Assigns BNC 5 as the output source                                                                                                                                        |
|                                           |                                | Enabled, Primary Source: Input 3 <sup>b</sup> | Assigns BNC 4 as the output source                                                                                                                                        |
|                                           |                                | Enabled, Primary Source: Input 4 <sup>b</sup> | Assigns BNC 6 as the output source                                                                                                                                        |
|                                           | Output 2 Auto Change Over Mode | Disabled                                      | Disables the ACO Mode. User can assign any source for Output 2 from the <b>Output Source Settings</b> area.                                                               |
|                                           |                                | Enabled, Primary Source: Input 1 <sup>a</sup> | Assigns BNC 3 as the output source                                                                                                                                        |
|                                           |                                | Enabled, Primary Source: Input 2 <sup>a</sup> | Assigns BNC 5 as the output source                                                                                                                                        |
|                                           |                                | Enabled, Primary Source: Input 3 <sup>b</sup> | Assigns BNC 4 as the output source                                                                                                                                        |
|                                           |                                | Enabled, Primary Source: Input 4 <sup>b</sup> | Assigns BNC 6 as the output source                                                                                                                                        |
| <b>Output Source Settings (Read-only)</b> | Output 1 Source                | Input #                                       | Displays the secondary source for Output 1                                                                                                                                |
|                                           | Output 2 Source                | Input #                                       | Displays the secondary source for Output 2                                                                                                                                |

a. This option is only available when JP10 is set to Input 1&2.

b. This option is only available when JP10 is set to Input 3&4.

## Dual 2x1 with Tracking Mode

**Table 5.8** summarizes the **Remote Control Menu** options available in DashBoard when the AVS-8764 is operating in Dual 2x1 Tracking Mode.

**Table 5.8 Remote Control Menu Items - Dual 2X1 Tracking Mode**

| Tab Title                                 | Item                           | Parameters                                    | Description                                                                                                                                                                                            |
|-------------------------------------------|--------------------------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Remote Control (Read-only)</b>         | Operating Mode                 | Dual 2x1, Output 2 tracks Output 1            | <ul style="list-style-type: none"> <li>Card is operating in Dual 2x1 Mode and Output 2 tracks Output 1</li> <li><b>JP4</b> is set to <b>2x1</b></li> <li><b>JP9</b> is set to <b>FOLLOW</b></li> </ul> |
| <b>Auto Change Over Settings</b>          | Output 1 Auto Change Over Mode | Disabled*                                     | Disables the ACO Mode. User can assign any source for Output 1 from the <b>Output Source Settings</b> area.                                                                                            |
|                                           |                                | Enabled, Primary Source: Input 1 <sup>a</sup> | <ul style="list-style-type: none"> <li>ACO Mode is enabled</li> <li>Assigns BNC 3 as the source for Output 1</li> <li>Automatically assigns BNC 4 as the source for Output 2</li> </ul>                |
|                                           |                                | Enabled, Primary Source: Input 2 <sup>a</sup> | <ul style="list-style-type: none"> <li>ACO Mode is enabled</li> <li>Assigns BNC 5 as the source for Output 1</li> <li>Automatically assigns BNC 6 as the source for Output 2</li> </ul>                |
|                                           |                                | Enabled, Primary Source: Input 3 <sup>b</sup> | Assigns BNC 4 as the source for Output 1                                                                                                                                                               |
|                                           |                                | Enabled, Primary Source: Input 4 <sup>b</sup> | Assigns BNC 6 as the source for Output 1                                                                                                                                                               |
|                                           | Output 2 Auto Change Over Mode | Enabled, Primary Source: Input 3 <sup>a</sup> | <ul style="list-style-type: none"> <li>ACO Mode is enabled</li> <li>BNC 3 is the source for Output 1</li> <li>BNC 4 is the source for Output 2</li> </ul>                                              |
|                                           |                                | Enabled, Primary Source: Input 4 <sup>a</sup> | <ul style="list-style-type: none"> <li>ACO Mode is enabled</li> <li>BNC 5 is the source for Output 1</li> <li>BNC 6 is the source for Output 2</li> </ul>                                              |
| <b>Output Source Settings (Read-only)</b> | Output 1 Source                | Input #                                       | Displays the secondary source for Output 1                                                                                                                                                             |
|                                           | Output 2 Source                | Input #                                       | Displays the secondary source for Output 2                                                                                                                                                             |

a. This option is only available when JP10 is set to Input 1&2.

b. This option is only available when JP10 is set to Input 3&4.

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## Alarms Tab

**Table 5.9** summarizes the options available in the **Alarms** tab.

**Table 5.9 Alarms Menu Items**

| Tab Title     | Item              | Parameters | Description                                                                                                |
|---------------|-------------------|------------|------------------------------------------------------------------------------------------------------------|
| <b>Alarms</b> | Loss of Output #  | Notify*    | <b>Signal Status</b> field in the <b>Signal</b> tab reports loss of the output conditions when they occur  |
|               |                   | Ignore     | <b>Signal Status</b> field in the <b>Signal</b> tab will ignore loss of output conditions                  |
|               | Loss of Reference | Notify*    | <b>Reference</b> field in the <b>Signal</b> tab reports loss of input conditions when they occur           |
|               |                   | Ignore     | <b>Reference</b> field in the <b>Signal</b> tab will ignore loss of input conditions                       |
|               | Loss of Input #   | Notify*    | Corresponding <b>Input</b> field in the <b>Signal</b> tab reports loss of input conditions when they occur |
|               |                   | Ignore     | Corresponding <b>Input</b> field in the <b>Signal</b> tab will ignore loss of input conditions             |



# Jumpers Tab

Table 5.10 summarizes the read-only information displayed in the **Jumpers** tab.

**Table 5.10 Jumpers Menu Items**

| Tab Title      | Item                      | Parameters     | Description                                                                     |
|----------------|---------------------------|----------------|---------------------------------------------------------------------------------|
| <b>Jumpers</b> | Card Control              | Local          | Card control is performed on the card or with an RCM-8120 remote control module |
|                |                           | Remote         | <b>JP8</b> is set to <b>REMOTE</b>                                              |
|                | Control Mode <sup>a</sup> | Panel - Master | Card is controlled by the RCM-8120 panel                                        |
|                |                           | Panel - Slave  | Card is controlled by the RCM-8120 panel                                        |
|                |                           | GPI Level      | Source selection GPI levels is controlled by GPI levels                         |
|                |                           | GPI Edge       | Source selection is controlled by GPI transitions                               |
|                | Panel Type                | 4-button       | The card is connected to the RCM-8120                                           |
|                |                           | 2-button       | The card is connected to the RCM-8120-1                                         |
|                | Xpoint Mode               | 4x1            | The card is operating with four inputs for each output                          |
|                |                           | 2x1            | The card is operating with two inputs for each output                           |
|                | SW2 Control               | Normal         | Output 2 is controlled independently                                            |
|                |                           | Follow         | Output 2 will follow Output 1                                                   |
|                | SW2 2x1 Mode              | Input 1 & 2    | Output 2 selects between inputs 1 and 2                                         |
|                |                           | Input 3 & 4    | Output 2 selects between inputs 3 and 4                                         |
|                | Ref Selected              | Frame 1        | The card is using frame reference 1                                             |
|                |                           | Frame 2        | The card is using frame reference 2                                             |
|                | Input Signal Type         | Video          | The card uses Analog Composite Video for sync tip clamping                      |
|                |                           | AES            | The card uses AES/EBU digital audio for sync tip clamping                       |
|                |                           | RGB            | The card uses RGB video without sync for sync tip clamping                      |

a. Based on the settings of JP3, JP1, and JP11.



# Specifications

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## In This Chapter

This chapter provides technical information for the AVS-8764 based on the type of rear module used. Note that technical specifications are subject to change without notice.

The following topics are discussed:

- 8310AR-030, 8320AR-030, and 8320AR-031

# 8310AR-030, 8320AR-030, and 8320AR-031

Refer to **Table 6.1** when using the 8310AR-030, 8320AR-030, or 8320AR-031 Rear Modules with the AVS-8764.

**Table 6.1 AVS-8764 Technical Specifications - 8310AR-030, 8320AR-030, and 8320AR-031**

| Category               | Parameter                       | Specification                                                                        |
|------------------------|---------------------------------|--------------------------------------------------------------------------------------|
| <b>Inputs</b>          | Standards Accommodated          | Analog video (NTSC, PAL, RGB, YUV) or unbalanced AES/EBU Audio (SMPTE 276M, AES 3id) |
|                        | Input Specification             | BNC Balanced connectors (AES 3id)                                                    |
|                        | Number of Inputs                | Full Rear Modules: 4<br>Split Rear Modules: 2                                        |
|                        | Input Level                     | 1Vpp normal                                                                          |
|                        | Return Loss                     | >42dB to 6MHz                                                                        |
|                        | Input Impedance                 | 75ohm terminating                                                                    |
| <b>Outputs</b>         | Number of Outputs               | Switch 1: 2<br>Switch 2: 2                                                           |
|                        | Standards                       | NTSC, PAL, AES 3id                                                                   |
|                        | Output Impedance                | 75 ohm                                                                               |
|                        | Output Isolation                | >42dB to 6MHz                                                                        |
|                        | Output Return Loss              | >34dB to 6MHz                                                                        |
|                        | DC Offset                       | <50mV                                                                                |
|                        | Jitter                          | <4nS (with input received through 1800ft of 1694A coax cable, AES-3id)               |
| <b>Reference Input</b> | Standards                       | NTSC, PAL, 1080i 50Hz, 1080i 59.94Hz, 720p 50Hz, and 720p 59.94Hz                    |
| <b>Performance</b>     | Gain                            | Unity                                                                                |
|                        | Gain Stability                  | <0.1% per 10°C                                                                       |
|                        | Frequency Response              | ±0.05dB to 10MHz typical                                                             |
|                        | Line Rate Window Tilt           | <0.2%                                                                                |
|                        | Field Rate Window Tilt          | <0.2%                                                                                |
|                        | 50/60 Hz Square Wave Tilt       | <0.1%                                                                                |
|                        | Bounce (Black to White)         | <0.5%                                                                                |
|                        | Differential Gain (10-90% APL)  | <0.2%                                                                                |
|                        | Differential Phase (10-90% APL) | <0.2% All Outputs Loaded                                                             |
| <b>Performance</b>     | Channel to Channel Crosstalk    | -68dB RMS @ 3.58 MHz any case                                                        |
|                        | RMS Noise 0-5 MHz (unweighted)  | 62dB                                                                                 |
|                        | Chrominance/Luminance Delay     | < 2.0ns                                                                              |
|                        | K Rating 2T                     | 1.3%                                                                                 |
| <b>Power</b>           | Total Power Consumption         | < 2.2W                                                                               |

## 8310AR-034 and 8320AR-034

Refer to **Table 6.2** when using the 8310AR-034 and 8320AR-034 rear modules with the AVS-8764.

**Table 6.2 AVS-8764 Technical Specifications - 8310AR-034 and 8320AR-034**

| Category               | Parameter               | Specification                                                                |
|------------------------|-------------------------|------------------------------------------------------------------------------|
| <b>AES-3 Inputs</b>    | Input Specification     | 2 BNC with 8 Balanced AES (Audio) WECO® connectors                           |
|                        | Connector               | 3-pin WECO®                                                                  |
|                        | Sampling Rates          | 28-50kHz                                                                     |
|                        | Input Impedance         | 110ohm terminating                                                           |
|                        | Input Return Loss       | >30dB (0.1 to 6MHz)                                                          |
|                        | Minimum Input Level     | 0.20Vpp                                                                      |
|                        | Maximum Input Level     | 7.0Vpp (continuous)                                                          |
| <b>AES-3 Outputs</b>   | Output Specification    | AES-3, Balanced                                                              |
|                        | Connector               | 3-pin WECO®                                                                  |
|                        | Output Impedance        | 110ohm                                                                       |
|                        | Output Return Loss      | >30dB (0.1 to 6MHz)                                                          |
|                        | Nominal Output Level    | 4.5Vpp                                                                       |
|                        | Jitter                  | <4nS (with input received through 600ft of 1800B, AES-3 digital audio cable) |
| <b>Reference Input</b> | Standards               | NTSC/PAL                                                                     |
| <b>Power</b>           | Total Power Consumption | <2.2W                                                                        |



# 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 AVS-8764, 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 AVS-8764.

### To reload the software on a AVS-8764

1. Eject the card from the frame.
2. Press and hold the **Bootload** button, while re-inserting the card into the frame.
3. Release the button.
  - The **PWR 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 its last operational software load.
  - Software can be uploaded to the AVS-8764 via DashBoard.



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## Warranty and Repair Policy

The AVS-8764 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 AVS-8764 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 AVS-8764 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 AVS-8764 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 AVS-8764 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 AVS-8764, 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 AVS-8764. 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

## Technical Support

Telephone: +1 613 • 652 • 4886  
After Hours Emergency: +1 613 • 349 • 0006  
Email: [techsupport@rossvideo.com](mailto:techsupport@rossvideo.com)

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