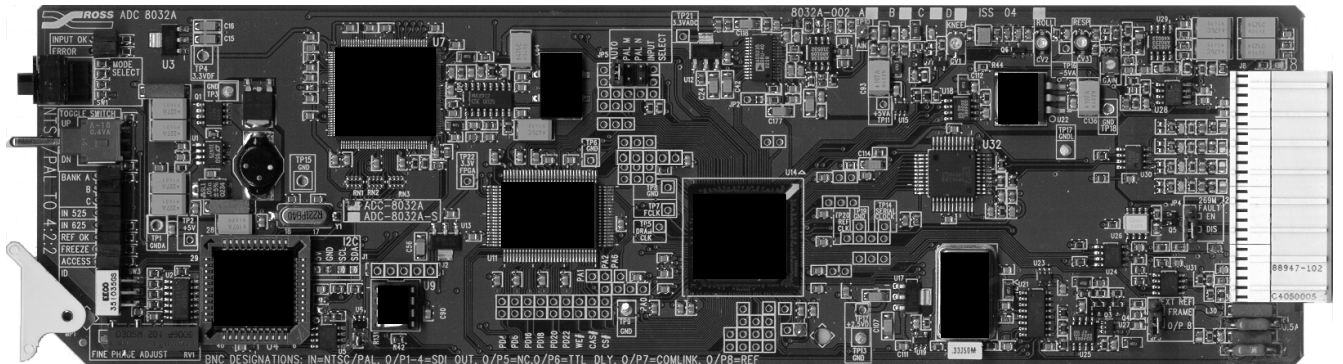


# ADC-8032A

# ADC-8032A-S

## Analog Composite to SDI Decoder User Manual



Ross Part Number: 8032AD-004  
Issue: 04

---

## ADC-8032A • Analog Composite to SDI Decoder User Manual

- Ross Part Number: **8032AD-004**
- Document Issue: **04**
- Printing Date: November 12, 2003. Printed in Canada.
- Software Issue: **1.00**

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

---

### Copyright

© 2003 Ross Video Limited. All rights reserved.

Contents of this publication may not be reproduced in any form without the written permission of Ross Video Limited. Reproduction or reverse engineering of copyrighted software is prohibited.


---

### 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 a commitment by Ross Video Limited. Ross Video Limited assumes no responsibility or liability for errors or inaccuracies that may appear in this manual.

---

### Trademarks

-  is a registered trademark of Ross Video Limited.
- Ross, ROSS, ROSS®, and MLE are registered trademarks of Ross Video Limited.
- All other product names and any registered and unregistered trademarks mentioned in this manual are used for identification purposes only and remain the exclusive property of their respective owners.

---

## Important Regulatory and Safety Notices to Service Personnel

Please review the following material to avoid injury to personnel and to prevent product damage.

- All product servicing should be carried out by qualified service personnel.
- This product may require specific equipment, and/or installation procedures to be carried out to satisfy certain regulatory compliance requirements. The following notices have been included in the manual, to call attention to these specific requirements.

### Symbol Meanings



- **Protective Earth** — This symbol alerts the user of the need to have a protective grounding source to avoid damage to electronic components.



- **Caution** — This symbol alerts the user to a procedure which may cause irreversible problems. Refer to important safety and compliance information.



- **Warning Hazardous Voltages** — This symbol alerts the user to the presence of an insulated dangerous voltage within the enclosure of the product.

### Important Safety Instructions



- Do not use this device near water. Hazardous voltages can occur.
- Clean only with a dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other devices (including amplifiers) that produce heat.
- Do not defeat the safety purposes of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the device.
- Only use attachments/accessories specified by the manufacturer.
- Unplug this apparatus during lightning storms or when not in use for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the device has been damaged in any way, such as: power-supply cord or plug is damaged, objects have fallen into the device, the device has been exposed to rain or moisture, the device does not operate normally or has been dropped.

## Power Cord and Supply Grounding Requirements



The safe operation of this product requires that a protective earth connection be provided. This protective earth is provided by the grounding conductor in the equipment's supply cord. To reduce the risk of electrical shock to operator and service personnel, this ground conductor must be connected to an earthed ground.

This product is equipped with a Class 1 Type power supply, which for safe operation requires the use of a protective earth connection. To reduce the risk of electrical shock, use only properly earthed three-conductor type line cords as outlined below:

- **North American Line Cords 100 - 120 Volts**

In North America, use only certified IEC 320-C13, 10A/125V, SVT type line cords. Conductors are CEE color coded blue (neutral), brown (line) and green/yellow (ground). North American product orders come equipped with a single 10A/125V SVT type line cord for each RossGear or GearLite product ordered.

- **International Line Cords 200 - 240 Volts**

This product is designed for use with certified IEC 320-C13, 10A/250V - H03 VV-F3G 1.00mm<sup>2</sup> type line cords.

International product orders come equipped with a single certified 10A/250V line cord, utilizing a molded 3-pin IEC 320-C13 type connector at one end and stripped conductors at the other. Conductors are CEE color-coded: blue (neutral), brown (line), and green/yellow (ground). Installation of an appropriately approved A/C wall plug certified for the country of use by a qualified electrician is required.

Alternatively, other IEC 320 C-13 type power supply cords may be used provided that they meet all safety requirements necessary for the country in which they are to be used.

## EMC Notices

- **FCC**

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

- **CE**

This product has been tested and meets the requirements of the European CE marking directive. A copy of the CE Declaration of Conformity can be provided upon request.

## Maintenance/User Serviceable Parts

Routine maintenance to this RossGear or GearLite 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 RossGear GearLite products are covered by a generous 3-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.



# Contents

<b>Introduction</b>	<b>1-1</b>
In This Chapter .....	1-1
A Word of Thanks .....	1-1
Overview .....	1-1
Functional Block Diagram .....	1-2
Features .....	1-3
Documentation Terms .....	1-4
Abbreviations .....	1-4
<b>Installation and Setup</b>	<b>2-1</b>
In This Chapter .....	2-1
Static Discharge .....	2-1
Unpacking .....	2-1
Jumper Setup .....	2-2
Board Installation .....	2-3
Cable Connections .....	2-3
<b>User Controls</b>	<b>3-1</b>
In This Chapter .....	3-1
User Controls .....	3-2
Troubleshooting Checklist .....	3-4
<b>Using Banks</b>	<b>4-1</b>
In This Chapter .....	4-1
General Operating Rules .....	4-1
Selecting Banks .....	4-2
Using Bank A Functions .....	4-6
Using Bank B Functions .....	4-11
Using Bank C Functions .....	4-13
Timing Modes .....	4-15
<b>SMPTE 269M Fault Reporting</b>	<b>5-1</b>
In This Chapter .....	5-1
Overview .....	5-1
Jumper Setup .....	5-2
Frame Connections .....	5-2
Details .....	5-2
<b>Comlink</b>	<b>6-1</b>
In This Chapter .....	6-1

Overview .....	6-1
Cable Construction .....	6-2
Connection and Configuration .....	6-3
<b>Specifications</b>	<b>7-1</b>
In This Chapter .....	7-1
Technical Specifications .....	7-2
<b>Ordering Information</b>	<b>8-1</b>
In This Chapter .....	8-1
ADC-8032A and Related Products .....	8-1
Warranty and Repair Policy .....	8-2

# Introduction

---

## In This Chapter

This chapter contains the following information sections:

- A Word of Thanks
- Overview
- Functional Block Diagram
- Features
- Documentation Terms

### A Word of Thanks

Congratulations on choosing the Ross Video **ADC-8032A Analog Composite to SDI Decoder**. You have purchased a powerful, versatile, and advanced decoder. The ADC-8032A is part of a full line of Digital Conversion Products within the RossGear Terminal Equipment family of products, backed by Ross Video's experience in engineering and design expertise since 1974.

You will be pleased at how easily your new ADC-8032A 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 operation of your ADC-8032A, please contact us at the numbers listed in this publication. Our technical support staff is always available for consultation, training, or service.

### Overview

The ADC-8032A Analog Composite to SDI Decoder is a 10-bit broadcast quality decoder with a 12-bit analog to digital converter. It is specifically designed for broadcast or production situations in which an analog PAL, PAL-M, PAL-N, or NTSC composite signal must be converted to a component SDI signal. Four SDI outputs are provided. The ADC-8032A fits into the Ross 8000 series digital frames, with four cards in the DFR-8104A (1RU), and up to ten cards in the DFR-8110A (2RU). Please refer to the frame User Manual for specific ventilation and cooling instructions to maintain optimum operating conditions. This card also fits into Leitch\* FR-6800 series frames to provide you with greater installation versatility. The ADC-8032A is available in two different models:

---

\* Leitch is a trademark of Leitch Technology Corporation

- **ADC-8032A** - The base model decoder includes **Proc Amp**, **Line Delay**, and **Line Synchronizer** timing modes.
- **ADC-8032A-S** - The “S” model includes a **Frame Synchronizer**, along with all the features available on the ADC-8032A

The ADC-8032A-S version comes with a fully functional frame synchronizer, capable of synchronizing incoming video to house reference. Various timing modes are available to accommodate most situations. New techniques in frame synchronization contribute to the board’s low power requirements and compact design. The complete circuit for the ADC-8032A, including a 12-bit A-D converter, decoder, frame (or line) synchronizer, serializer, TTL tracking delay pulse, and microprocessor is contained on a single DA-sized card. Additional daughter cards are not required.

A rich set of features is instantly accessible using simple card-edge switches and controls in conjunction with a concise Heads-Up Display. The ADC-8032A’s 10-bit decoding process provides excellent performance with all types of picture sources. In order to achieve the highest level of precision, all signal processing and decoding is performed entirely in the digital domain. The decoder uses a very sophisticated 5-line comb filter with advanced adaptive control algorithms.

To make configuration simple and easy, the ADC-8032A offers a Heads-Up Display mode for most board-level adjustments. This display is especially convenient during setup, and for programming several ADC-8032A cards with identical configurations. With the display enabled, the parameter currently being adjusted has its value super-imposed over *all* board outputs. As an alternative to the Heads-up Display, the board’s Comlink Terminal Display allows you to view *all settings* simultaneously on any PC running VT-100 terminal emulation. The only requirement is a connection between the PC’s serial port and the ADC-8032A’s Comlink connector. This feature is especially convenient for making adjustments while the card’s output is on air.

The ADC-8032A and the ADC-8032A-S decoders are part of a full line of RossGear digital distribution products engineered to satisfy the highest quality broadcast standards and the most demanding requirements of your facility.

## Functional Block Diagram

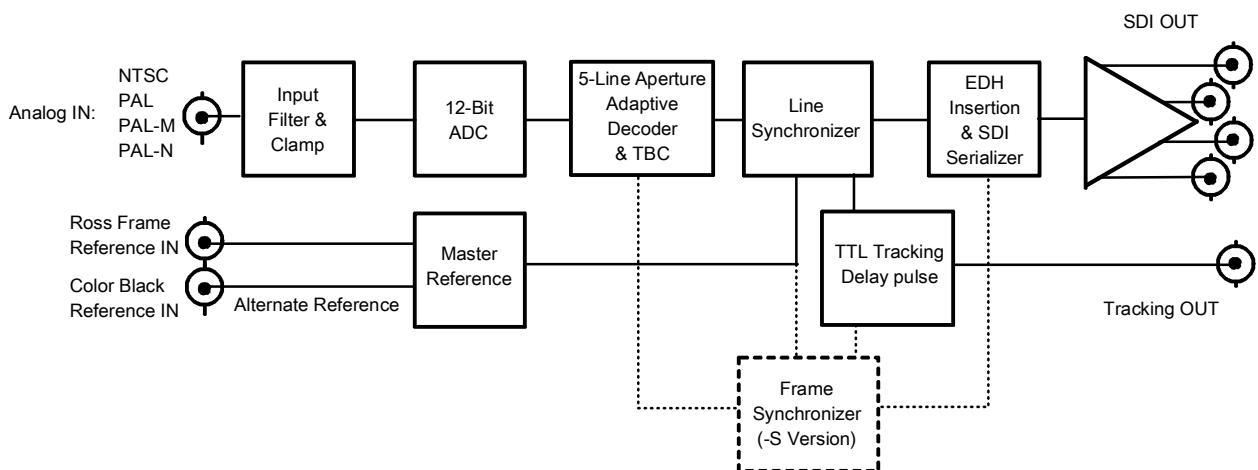


Figure 1. Simplified Block Diagram of ADC-8032A Functions



## Features

The following features make the ADC-8032A Analog Composite to SDI Decoder the most flexible, high-quality decoding card for your analog to digital conversion requirements:

- 10-bit decoding with 5-line adaptive comb filter
- 12-bit analog to digital conversion
- Handles difficult signals such as satellite or microwave feeds
- Compact design on a single DA-sized card
- Heads-Up display
- Optional Frame Synchronization (no daughter card required)
- Field-upgradeable Frame Synchronization option available
- Extensive Proc Amp controls
- Freeze modes
- Hot-switching
- Horizontal and vertical timing adjustments
- Programmable vertical interval blanking
- Setup adjustment
- Black level offset
- Super black control
- Input and conversion status indicator LED's on card edge
- Auto-detects NTSC/PAL
- Jumper-selectable PAL-M/PAL-N
- Choice of reference inputs
- Four serial digital outputs
- TTL Tracking Delay Output for companion audio synchronizer
- Comlink terminal display
- SMPTE 269M Fault Reporting
- Fits Ross Video 8000 series digital products frames and Leitch FR-6800 series frames
- 5-year transferable warranty

## Documentation Terms

The following terms are used throughout this guide:

- “**Frame**” refers to the **DFR-8104A** and **DFR-8110A** frames that house the **ADC-8032A** card.
- All references to the **DFR-8104A** and **DFR-8110A** also include the **DFR-8104A-C** and **DFR-8110A-C** versions with the cooling fan option. See the respective User Manuals for details.
- “**Operator**” and “**User**” both refer to the person who uses the **ADC-8032A**.
- “**Board**”, “**Card**”, and “**Module**” all refer to the **ADC-8032A** decoder board itself, including all components and switches.
- “**System**” and “**Video system**” refers to the mix of interconnected digital and analog production and terminal equipment in which the **ADC-8032A** operates.
- “**525-line mode**” refers to broadcast situations using **NTSC** or **PAL-M** composite (analog) signal reference inputs.
- “**625-line mode**” refers to broadcast situations using **PAL-B** or **PAL-N** composite (analog) signal reference inputs. All references to **PAL** in this manual imply that **PAL-B** is being used.
- All references to **PAL-N** are “combination N” (ITU-R BT. 470-6)

## Abbreviations

The following abbreviations may be used throughout the text:

Abbreviation	Definition
ADC	Analog to Digital Converter
A-D	Analog-to-Digital
D-A	Digital-to-Analog
DA	Distribution Amplifier
DAC	Digital to Analog Converter
DDR	Digital Disk Recorder
DIS	Disable
DVR	Digital Video Recorder
EN	Enable
LOW SIG	Low Signal
RU	Rack Unit
SDI	Serial Digital Interface
VCR	Video Cassette Recorder
VTR	Video Tape Recorder

# Installation and Setup

---

## In This Chapter

This chapter contains the following information sections:

- Static Discharge
- Unpacking
- Jumper Setup
- Board Installation
- Cable Connections

### Static Discharge

Whenever handling the ADC-8032A and other related equipment, please observe all static discharge precautions as described in the following note:



**Caution**

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

### Unpacking

Unpack each ADC-8032A you received from the shipping container, and check the contents against the packing list to ensure that all items are included. If any items are missing or damaged, contact your sales representative or Ross Video directly.

## Jumper Setup

Use the following steps to set up ADC-8032A jumpers. These steps are performed *before* installing the unit in the frame, but may be repeated as required. Refer to Figure 2 for card jumper locations.

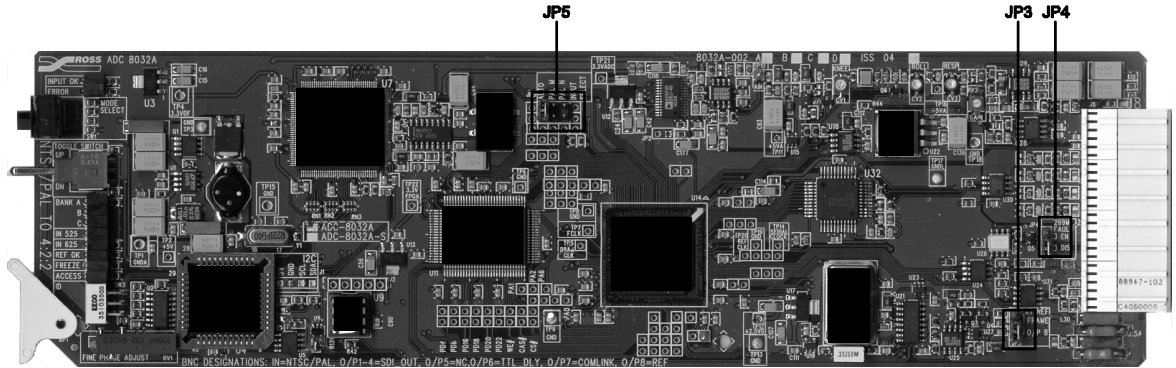


Figure 2. ADC-8032A Jumper Locations

1. Using the figure above and the card silk-screening, set **JP5 (Input Select)** to select the input video standard:
  - Set jumper on pins **1-4 (Auto)** to automatically select between NTSC and PAL (default setting)
  - Set jumper on pins **2-5 (PAL-M)** for PAL-M decoding
  - Set jumper on pins **3-6 (PAL-N)** for PAL-N decoding
2. An analog composite reference is required for **Line Sync** and **Frame Sync** modes. Using the figure above and the card silk-screening, set Jumper **JP3 (Ext Ref)** to determine the location from which you want to obtain external reference.
  - Set jumper on pins **1-2 (Frame)** to obtain the reference from the frame's master reference (analog reference) connector (default setting)
  - Set jumper on pins **2-3 (O/P8)** to obtain the reference from connector **8** on the back-plane
3. (Optional) Using the figure above and the card silk-screening, set Jumper **JP4 (269M Fault Reporting)** to enable or disable the card's SMPTE alarm:
  - Set jumper on pins **1-2 (EN)** to enable SMPTE fault reporting (default setting)
  - Set jumper on pins **2-3 (DIS)** to disable SMPTE fault reporting(See Chapter 5, "SMPTE 269M Fault Reporting" for details on fault reporting.)

## Board Installation

Use the following steps to install the ADC-8032A in a RossGear 8000 series digital distribution frame:

1. Refer to the User Manual of the RossGear 8000 series frame, to ensure that the frame is properly installed according to instructions. If this module is to be installed in any compatible frame other than a Ross Video product, refer to the frame manufacturer's manual for specific instructions.
2. Please note that heat and power distribution requirements within a frame may dictate specific slot placement 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.
3. After selecting the desired frame installation slot, hold the ADC-8032A card by the edges and carefully align the card edges with the slots in the frame. Then fully insert the card into the frame until the rear connection plug is properly seated.

## Cable Connections

This section provides instructions for connecting cables to the ADC-8032A when mounted in RossGear 8000 series Digital Products Frames. See the following frame rear panel diagram for BNC input and output designations:

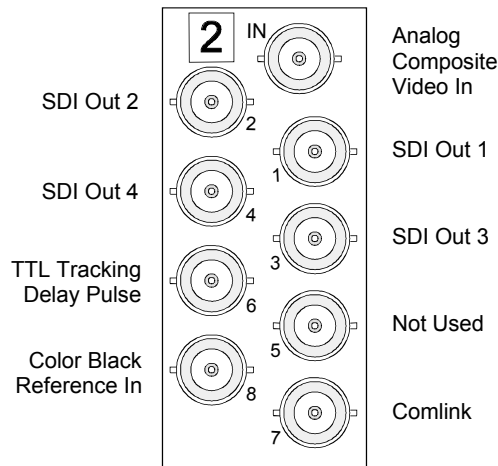


Figure 3. ADC-8032A BNC Designations for RossGear Frames

Connect the BNC cables as follows:

1. Connect the **Analog Composite IN** BNC connector to the output of your analog composite device.
2. Connect BNCs **1** through **4** to the inputs of four component SDI devices.
3. Connect BNC **6** to any device that needs to track the video delay through the 8032A or 8032A-S. (RossGear ADL-8520 AES/EBU Auto Tracking Audio Delay)  
The TTL Tracking Delay Pulse is a positive 5V pulse. Its width tracks the video delay as it passes through the card. The ADC-8032A TTL pulse tracks up to 2 video lines, the ADC-8032A-S up to 2 fields.
4. If you wish to use the Comlink functionality, connect the BNC end of the Comlink adapter cable (not supplied) to BNC **7**. See Chapter 6, “**Comlink**” for details on this optional feature.
5. Connect a video reference one of two ways:

- If you wish to obtain the reference directly from the card's back plane, connect a composite analog color black reference to BNC **8**. Be sure that pins **2-3 (O/P8)** are shorted on Jumper **JP3**. Please refer to the previous section entitled, "**Jumper Setup**".

**Note**

BNC **8** is terminated at 75-ohms on the card.

- If you wish to reference the card from the frame's Master Reference connector, ensure that a composite analog color black reference signal is connected to the REF BNC on the frame (see Figure 6 in chapter 5). Be sure that Jumper **JP3** is set to pins **1-2 (Frame)**.

# User Controls

---

## In This Chapter

This section contains the following sections:

- User Controls
- Troubleshooting Checklist

### Note

The ADC-8032A uses card edge controls for changing operational parameters. The card defaults with switch access set to the locked position. Refer to the “**Bank A - F: Lock/Unlock Switch Access**” section in Chapter 4, “**Using Banks**”, before attempting to make any adjustments.

## User Controls

The following are general descriptions of the user controls identified in the figure below, presented in normal operating sequence.

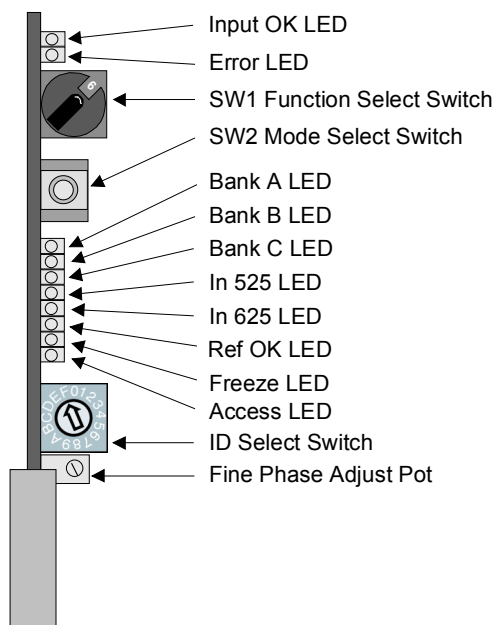


Figure 4. ADC-8032A Card-edge User Controls

### SW1 – Function Select Switch

The **SW1 Function Select** switch is a 16-position rotary switch used to select functions such as decoder channel, video standard, and video setup menu items. The SW1 switch works in conjunction with the SW2 toggle switch; first, the function category is selected with SW1, and then the SW2 toggle switch is used to select modes or configuration settings within that function selection. See Chapter 4, “Using Banks” for complete details.

### SW2 – Mode Select Switch

The **SW2 Mode Select** switch is used to enable, disable, and select specific ADC-8032A *functional modes*, or *configurations*, within the operational function menu (selected first with the SW1 Function Select switch). The **Mode Select** switch is a 3-position momentary toggle switch with an automatic spring-return to the center (null or unity) position.

Two methods of toggling SW2 are used to select basic and advanced level menu items.

- Single toggle to select single options
- Hold toggle to scroll through multiple values or options

Toggling the switch for menu selection is made according to two basic menu design categories:

- menu selections utilizing a scrolling *wrap-around* style of selection (from last menu item directly back to first menu item)
- menu selections utilizing a *bi-directional* upper and lower range limit

### ID Select Switch

No user adjustment required.



## Fine Phase Adjust Potentiometer

The RV1 Fine Phase Adjust potentiometer adjusts the board's output delay in sub-pixel increments, with a range of 0 (zero) to approximately 45ns.

## Status and Selection LEDs

The front edge of the card features ten LEDs that display the status of the input signals, and indicate menu function and configuration selections.

As selections are made from the menu tables, (see Chapter 4, "Using Banks" for complete bank menu table descriptions), the LEDs display the status of the input signals for each bank, as well as menu function and configuration selections. Basic LED displays and descriptions are provided in the following table:

Table 1. Selection and Status LED Descriptions

LED	Color	Display and Description
INPUT OK	Green	When lit, this LED indicates that the card is functioning normally and that no anomalies have been detected. Both of the following conditions must be satisfied: <ul style="list-style-type: none"> <li>• A valid input signal is present</li> <li>• A valid reference signal is present when a reference is required, and that the reference standard matches the input standard. Selecting Line Sync or Frame Sync modes require that a reference signal is present</li> </ul>
ERROR	Red	When lit, this LED indicates that conditions for INPUT OK are not met. Mutually exclusive with INPUT OK LED.
BANK A	Green	When lit, this LED confirms that Bank A is selected.
BANK B	Green	When lit, this LED confirms that Bank B is selected.
BANK C	Green	When lit, this LED confirms that Bank C is selected.
IN 525	Green	Lights when the input signal is 525-lines (NTSC or PAL-M).
IN 625	Green	Lights when the input signal is 625-lines (PAL or PAL-N).
REF OK	Green	When lit, this LED indicates a reference signal is present at the Master REF or BNC input, and that the reference signal is locked. <ul style="list-style-type: none"> <li>• <i>On</i> = External reference standard matches the input standard</li> <li>• <i>Flashing</i> = External reference standard does not match the input standard</li> <li>• <i>Off</i> = No external reference is present</li> </ul>
FREEZE	Yellow	When lit, this LED indicates that any freeze mode is enabled (both models).
ACCESS	Yellow	When lit, this LED indicates that Switch Access is unlocked. See Bank A Functions, Mode Select position F. All changes made with Mode Select will affect ADC-8032A operation.

## Troubleshooting Checklist

Routine maintenance to this RossGear product is not required. In the event of problems with your ADC-8032A, the following basic troubleshooting checklist may help identify the source of the problem. If the module still does not appear to be working properly after checking all possible causes, please contact your Ross Video products distributor, or the Ross Video Technical Support department at the numbers listed under the “Contact Us” section at the end of this manual.

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

# Using Banks

---

## In This Chapter

This section provides a detailed explanation on using Bank functions. The following topics are discussed:

- General Operating Rules
- Selecting Banks
- Using Bank A Functions
- Using Bank B Functions
- Using Bank C Functions
- Timing Modes

### General Operating Rules

Please note the following important operating rules for the ADC-8032A:

- Whenever the card is powered up, it defaults to Bank A, and the Bank A LED is lit.

#### Note

The card defaults with switch access set to the locked position. To unlock the access refer to the “**Bank A-F: Lock/Unlock Switch Access**” section in this chapter before attempting to make any adjustments.

- For each of the supported video formats (NTSC / PAL / PAL-M / PAL-N) the card stores the default or user-adjusted video settings independently in non-volatile memory. The selection of settings is determined by the setting of **JP5 Input select**, the video standard jumper.
- Always check to see that the **Input OK** LED is lit. If not, check that the inputs are valid. If a reference is used, check that the reference is valid and that the reference standard matches the input standard.
- Before making adjustments, choose the method that you wish to use. Three methods are available:

1. **No display** - Adjustments are made using the **Function Select** and **Mode Select** switches, without the assistance of the Heads-Up Display or the Comlink Display. Results should be confirmed with test equipment suitable for measuring the parameter being adjusted (such as a waveform monitor or vector scope).
2. **Heads-Up Display** - Adjustments are made using **Function Select** and **Mode Select** switches in conjunction with the Heads-Up Display. Ensure that the Heads-Up Display is enabled (Bank A, Position 1). Note that the display is superimposed over *all* ADC-8032A video outputs.
3. **Terminal Display** - Adjustments are made using **Function Select** and **Mode Select** switches in conjunction with the Comlink Display. Ensure that the Comlink port is properly connected to a PC. Refer to Chapter 8, “**Comlink**” for instructions.

**Note**

Both the **Heads-Up Display** and the **Comlink Display** can be used simultaneously.

**Operating Conventions For Function Tables**

The following rules apply to the function tables that are used throughout this section:

- The label “ + ” instructs you to toggle the **Mode Select** switch (**SW2**) *up* momentarily.
- The label “ - ” instructs you to toggle the **Mode Select** switch (**SW2**) *down* momentarily.
- The label “ + (h) ” instructs you to *hold* the **Mode Select** switch (**SW2**) *up* for one second.
- The label “ - (h) ” instructs you to *hold* the **Mode Select** switch (**SW2**) *down* for one second.

**Selecting Banks**

**Function Select** switch functionality is divided into three banks of functions. Use the following steps to select Bank A, B or C as required.

1. Rotate **Function Select** (**SW1**) to position 0. Note that position 0 is always used to select the bank, regardless of the bank that you are currently using.
2. Toggle **Mode Select** (**SW2**) up or down to choose the desired bank. Three positions are available: Bank A, B or C.
3. The table below illustrates each switch function, along with the Heads-Up Display label, the Status LED indication, and the default value. If you are not using a display, be sure to verify your selection on the Status LED's.

*Table 2. Switch and Bank Selection*

Mode Select SW2	Heads-up Display Label	Status LED	Default Bank
+ A	BANK A	BANK A	A
B	BANK B	BANK B	A
- C	BANK C	BANK C	A

## Bank A, B, and C Function Tables

This section presents a detailed charting of all board-level ADC-8032A functions in the following three tables. The operational usage is explained in the next section.

Table 3. Function Select: Bank A Function Table

SW1 Function Select	Function	SW2 Mode Select Options	Heads Up Display On-Screen Label and Value		Default Value
0	Bank Select	+ A - B - C	BANK	A B C	A
1	Heads-Up Display	+ (h) On - Off	HEADS UP	ON OFF	OFF
2	N/A				
3	N/A				
4	N/A				
5	N/A				
6	N/A				
7	N/A				
8	Video Gain <sup>m</sup>	+ Increase - Decrease	VID GAIN	(###.#)%	100% *
9	Black Level Offset <sup>m</sup>	+ Increase - Decrease	BLK OFF	(##.#) IRE	0 IRE *
A	Chroma Gain <sup>m</sup>	+ Increase - Decrease	CHROMA	(###.#)%	100% *
B	Hue <sup>m</sup>	+ Increase - Decrease	HUE	(###.#) DEG.	0 DEG. *
C	C <sub>B</sub> Gain <sup>m</sup>	+ Increase - Decrease	C <sub>B</sub> GAIN	(###.#)%	100% *
D	Chroma AGC	+ On - Off	CHROMA AGC	ON OFF	OFF *
E	Factory Defaults	+ (h) Reset All - (h) Reset Proc Amp	DEFAULT	ALL RST PROC RST	N/A
F	Switch Access **	+ Locked - (h) Unlocked	ACCESS	LOCKED UNLOCKED	LOCKED

**Note:** Functions, as listed in the Function column as being stored in memory, always power up in the last known state. All other items, however, power up in the default state, regardless of their previous state.

\* Indicates Proc Amp controls that are affected by position E, Factory Defaults function.

\*\* Locking Switch Access shuts off the Heads-up Display. Unlocking will not restore the display if it was previously enabled. This must be performed manually.

<sup>m</sup> Stored in memory

Table 4. Function Select: Bank B Function Table

SW1 Function Select	Function	SW2 Mode Select Options	Heads Up Display On-Screen Label and Value	Default Value
0	Bank Select	+ A - B - C	BANK A B C	A
1	Setup <sup>m</sup>	+ On - Off	SETUP ON OFF	ON* OFF **
2	N/A			
3	VI Blanking <sup>m</sup>	+ Blank - Pass Through	VI BLANK BLANK PASS	PASS
4	VI End <sup>m</sup>	+ Increase - Decrease	VI END (##)	20
5	SuperBlack <sup>m</sup>	+ Pass Through - Clip	SUPER BLK PASS CLIP	PASS
6	V Bit Lock <sup>m</sup>	+ Line 20 - Line 10	V BIT LOC 20 10	20
7	N/A			
8	N/A			
9	N/A			
A	N/A			
B	N/A			
C	N/A			
D	N/A			
E	N/A			
F	N/A			

**Note:** Functions, as listed in the Function column as being stored in memory, always power up in the last known state. All other items, however, power up in the default state, regardless of their previous state.

\* Indicates default PAL/PAL-N setting.

\*\* Indicates default NTSC/PAL-M setting.

<sup>m</sup> Stored in memory

Table 5. Function Select: Bank C Function Table

SW1 Function Select	Function	SW2 Mode Select Options	Heads Up Display On-Screen Label and Value		Default Value
0	Bank Select	+ A B - C	BANK	A B C	A
1	Timing Mode <sup>m</sup>	+ Frame Sync* Frame Delay* Line Sync - Line Delay	TIME MODE	FS FD LS LD	LS (FS on S model)
2	H Delay <sup>m</sup>	+ Increase - Decrease	H DELAY	(#####)	0
3	H Reset	+ Zero - No action	H RESET	ZERO	N/A
4	V Delay <sup>m</sup>	+ Increase - Decrease	V DELAY	(#)	0
5	V Reset	+ Zero - No action	V RESET	ZERO	N/A
6	Set Min. Delay	+ Zero - No action	MIN DEL	ZERO	N/A
7	Input Mode <sup>m</sup>	+ VTR input - Standard input	IN MODE	VTR STAND	STAND
8	Freeze Mode <sup>m, **</sup>	+ Frame Field 2 - Field 1	FRZ MODE	FRAME FLD 2 FLD 1	FLD 1
9	Forced Freeze	+ Freeze** - Pass Through	FREEZE	FORCE PASS	PASS
A	Input Loss Mode <sup>m</sup>	+ Freeze** - No Output Black	IN LOSS	RE-INIT FREEZE NO OUTPUT BLACK	BLACK
B	Hotswitch Mode <sup>m</sup>	+ Freeze** - Black Off	HOTSW MD	FREEZE BLACK OFF	OFF
C	Forced Black	+ (h) On - Off	FRCD BLK	ON OFF	OFF
D	Forced Mono	+ (h) On - Off	FRCD MONO	ON OFF	OFF
E	N/A				
F	N/A				

**Note:** Functions, as listed in the Function column as being stored in memory, always power up in the last known state. All other items, however, power up in the default state, regardless of their previous state.

\* Only available on ADC-8032A-S.

\*\* When Freeze mode is activated the freeze will affect either field 1, field 2, or the entire frame.

<sup>m</sup> Stored in memory

## Using Bank A Functions

The following topics are discussed in this section:

- Heads-up Display
- Video Gain
- Black Level Offset
- Chroma Gain
- Hue
- C<sub>B</sub> Gain
- Chroma AGC
- Factory Defaults
- Lock/Unlock Switch Access

### Important

The card defaults with switch access set to the locked position. To unlock the access refer to the “**Bank A-F: Lock/Unlock Switch Access**” section in this chapter before attempting to make any adjustments.

### **Bank A-1: Heads-up Display**

Use the following steps to enable or disable the Heads-up display:

1. Select Bank A, and rotate **SW1 Function Select** to position 1.
2. Choose the desired display mode:
  - Hold **Mode Select** *up* for one second to enable the display.
  - Hold **Mode Select** *down* to disable the display.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
A	1	+ (h) On - Off	HEADS UP ON OFF	OFF

### Note

The display is superimposed over all ADC-8032A video outputs. Do not use this feature with “on-air” signals.



### Bank A-8: Video Gain

Use the following steps to adjust the ADC-8032A's output video gain:

1. Select Bank A, and rotate **Function Select** to position 8.
2. Adjust video gain up or down as required:
  - Toggle **Mode Select** *up* to increase video gain.
  - Hold **Mode Select** *up* to increase video gain continuously.
  - Toggle **Mode Select** *down* to decrease video gain.
  - Hold **Mode Select** *down* to decrease video gain continuously.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
A	8	+ Increase - Decrease	VID GAIN (###.#)%	100%

**Note**

**Video Gain** is one of the six “Proc Amp” controls that can be reset using **Factory Defaults** (Bank A, Position E).

### Bank A-9: Black Level Offset

Use the following steps to change the card's output black level. This setting is a black level offset that is *not* affected by the **NTSC Setup** function (Bank B, Position 1). For example, with **Black Level Offset** at 1 IRE and **NTSC Setup** off, the black level will be 1 IRE. With **NTSC Setup** on and a setup level of 7.5 IRE, the black level will be 8.5 IRE.

1. Select Bank A, and rotate **Function Select** to position 9.
2. Choose the desired Black Level Offset setting:
  - Toggle **Mode Select** *up* to increase the black level offset.
  - Hold **Mode Select** *up* to increase the black level offset continuously.
  - Toggle **Mode Select** *down* to decrease the black level offset.
  - Hold **Mode Select** *down* to decrease the black level offset continuously.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
A	9	+ Increase - Decrease	BLK OFF (##.#) IRE	0 IRE

**Note**

**Black Level Offset** is one of the six “Proc Amp” controls that can be reset using **Factory Defaults** (Bank A, Position E).

### Bank A-A: Chroma Gain

Use the following steps to adjust the ADC-8032A's output chroma gain:

1. Select Bank A, and rotate **Function Select** to position A.
2. Adjust chroma gain up or down as required:
  - Toggle **Mode Select up** to increase chroma gain.
  - Hold **Mode Select up** to increase chroma gain continuously.
  - Toggle **Mode Select down** to decrease chroma gain.
  - Hold **Mode Select down** to decrease chroma gain continuously.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
A	A	+ Increase - Decrease	CHROMA (###.#)%	100%

**Note**

**Chroma Gain** is one of the six “Proc Amp” controls that can be reset using **Factory Defaults** (Bank A, Position E).

### Bank A-B: Hue

Use the following steps to adjust the ADC-8032A's output hue:

1. Select Bank A, and rotate **Function Select** to position B.
2. Adjust hue (in degrees) as required:
  - Toggle **Mode Select up** to change the hue in a clockwise direction.
  - Hold **Mode Select up** to change the hue clockwise, continuously.
  - Toggle **Mode Select down** to change the hue in a counter-clockwise direction.
  - Hold **Mode Select down** to change the hue counter-clockwise, continuously.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
A	B	+ Increase - Decrease	HUE (###.#) DEG.	0 DEG.

**Note**

**Hue** is one of the six “Proc Amp” controls that can be reset using **Factory Defaults** (Bank A, Position E).

### Bank A-C: C<sub>B</sub> Gain

Use the following steps to adjust the ADC-8032A's output C<sub>B</sub> gain:

1. Select Bank A, and rotate **Function Select** to position C.
2. Adjust C<sub>B</sub> Gain up or down as required:
  - Toggle **Mode Select** *up* to increase C<sub>B</sub> gain.
  - Hold **Mode Select** *up* to increase C<sub>B</sub> gain continuously.
  - Toggle **Mode Select** *down* to decrease C<sub>B</sub> gain.
  - Hold **Mode Select** *down* to decrease C<sub>B</sub> gain continuously.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
A	C	+ Increase - Decrease	C <sub>B</sub> GAIN (###.#)%	100%

**Note**

C<sub>B</sub> Gain is one of the six “Proc Amp” controls that can be reset using **Factory Defaults** (Bank A, Position E).

### Bank A-D: Chroma AGC

Use the following steps to enable or disable the Chroma AGC:

1. Select Bank A, and rotate **Function Select** to position D.
2. Choose the desired Chroma AGC state:
  - Toggle **Mode Select** up to enable Chroma AGC.
  - Toggle **Mode Select** down to disable Chroma AGC.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
A	D	+ On - Off	CHROMA AGC ON OFF	OFF

**Note**

**Chroma AGC** is one of the six “Proc Amp” controls that can be reset using **Factory Defaults** (Bank A, Position E).

**Note**

Care must be taken when turning on the **Chroma AGC**. This feature allows the decoder to automatically try and compensate for any perceived chroma deficiencies. The **Video Gain**, **Chroma Gain**, and C<sub>B</sub> Gain functions all affect chroma gain and will confuse the **Chroma AGC** function.

### Bank A-E: Factory Defaults

This function allows you to return all controls to their default values, or simply the six “Proc Amp” controls by themselves. Use the following steps to select factory default values:

1. Select Bank A, and rotate **Function Select** to position E.
2. Select the desired default settings:
  - Hold **Mode Select** up to reset all adjustments to their default values.
  - Hold **Mode Select** down to reset the six “Proc Amp” adjustments to their default values (**Video Gain**, **Black Level Offset**, **Chroma Gain**, **Hue**, **C<sub>B</sub> Gain**, and **Chroma AGC**).

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
A	E	+ (h) Reset All - (h) Reset Proc Amp	DEFAULT ALL RST PROC RST	N/A

### Bank A-F: Lock/Unlock Switch Access

The **Switch Access** function allows you to lock or unlock user access to all adjustment parameters. The “lock” function should be performed after installation to secure all settings, and to prevent anyone from accidentally changing the settings. Note the following rules:

- When access is locked, no adjustments can be made and the Heads-Up Display is automatically turned off.
- When you unlock switch access and you wish to use the Heads-Up display again, you must manually enable it (Bank A, Position 1).

Use the following steps to lock or unlock switch access:

1. Select Bank A, and rotate **Function Select** to position F.
2. Choose the desired access mode:
  - Toggle **Mode Select** *up* to lock switch access. Adjustments cannot be made, and the display is disabled. The **ACCESS** LED is off.
  - Hold **Mode Select** *down* for one second to unlock switch access. Adjustments can now be made. The **ACCESS** LED is on.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
A	F	+ Locked - (h) Unlocked	ACCESS LOCKED UNLOCKED	LOCKED

## Using Bank B Functions

The following topics are discussed in this section:

- Setup
- VI Blanking
- VI End
- SuperBlack
- V Bit Lock

### **Bank B-1: Setup**

Use the following steps to enable or disable setup:

1. Select Bank B, and rotate **Function Select** to position 1.
2. Choose the desired setup value:
  - Toggle **Mode Select** *up* to enable NTSC / PAL-M setup.
  - Toggle **Mode Select** *down* to disable NTSC / PAL-M setup.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label		Default
B	1	+ On - Off	SETUP	ON OFF	ON* OFF**

\* Indicates default NTSC / PAL-M setting

\*\* Indicates default PAL / PAL-N setting

### **Bank B-3: VI Blanking**

Use the following steps to blank the vertical interval, or allow the signals in the vertical interval to pass through the **ADC-8032A**:

1. Select Bank B, and rotate **Function Select** to position 3.
2. Choose the desired blanking mode:
  - Toggle **Mode Select** *up* to blank the vertical interval.
  - Toggle **Mode Select** *down* to pass the vertical interval.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label		Default
B	3	+ Blank - Pass Through	VI BLANK	BLANK PASS	PASS

### Bank B-4: VI End

The ADC-8032A has a programmable Vertical Interval function that allows you to set where the VI ends and the first line of active video begins. Everything up to (but not including) the first line of active video is considered part of the Vertical Interval and will be affected by this function. In 525-line mode, signals in the vertical interval are passed without setup even if setup is enabled. The range in 525-line mode is line 20 to 22. Use the following steps to select the end point for vertical blanking:

1. Select Bank B, and rotate **Function Select** to position 4.
2. Choose field 1 and field 2 settings, according to the table below:
  - Toggle **Mode Select up** to increase the line at which the VI ends.
  - Toggle **Mode Select down** to decrease the line at which the VI ends.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
B	4	+ Increase - Decrease	VI END (##)	20* or 23**

\* 525-line mode (NTSC / PAL-M) default value is selectable from 20-22

\*\* 626-line mode (PAL / PAL-N) default value is fixed at 23

### Bank B-5: SuperBlack

Use the following steps to enable or disable the SuperBlack clipping function:

1. Select Bank B, and rotate **Function Select** to position 5.
2. Choose the desired SuperBlack setting:
  - Toggle **Mode Select up** to allow the input's active video signal to pass through unaltered.
  - Toggle **Mode Select down** to clip any value below black.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
B	5	+ Pass Through - Clip	SUPER BLK PASS CLIP	PASS

### Bank B-6: V Bit Lock

Use the following steps to force the V bit on either line 10 or 20.

1. Select Bank B, and rotate **Function Select** to position 6.
2. Choose the desired line:
  - Toggle **Mode Select up** to have the V bit set on line 20.
  - Toggle **Mode Select down** to have the V bit set on line 10.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
B	2	+ Line 20 - Line 10	V BIT LOCK 20 10	20

## Using Bank C Functions

The following topics are discussed in this section:

- Timing Mode
- H Delay
- H Reset
- V Delay
- V Reset
- Set Minimum Delay
- Freeze Mode
- Forced Freeze
- Input Loss Mode
- Hotswitch Mode
- Forced Black
- Forced Monochrome

### ***Bank C-1: Timing Mode***

The following topics are discussed in this section:

- About the Timing Mode
- Timing Mode Summary
- Bank C-1: Timing Mode Procedure

### ***About the Timing Mode***

There are two versions of the ADC-8032A available. The standard ADC-8032A can be timed within one line in 37ns increments. The ADC-8032A-S with the frame synchronizer can be timed within one video frame in 37ns increments. The fine phase potentiometer (**RV1**) is provided for sub-pixel adjustment.

The presence of a frame synchronizer means that the **Frame Delay** and **Frame Sync** modes are available. Without the frame synchronizer, the **Line Delay** and **Line Sync** modes are available. Looking at it another way, the **S** version provides a full frame of memory, whereas the non-**S** version provides a few lines of memory. This means that the non-**S** version provides enough timing flexibility to meet a wide variety of applications. It also means that these cards can be upgraded in the field for full frame synchronizing capabilities. The following information provides detailed explanations of when to use each mode, as well as an analysis of the advantages each mode has to offer.

### ***Line Delay (ADC-8032A & ADC-8032A-S)***

**Line Delay** mode uses the input signal to generate the output timing. In other words, it provides a constant delay between the input and the output. The external reference is not used in any way. This is useful in applications where a constant delay through the card is required.

The delay through the card has a minimum value, as described in Chapter 7, “**Specifications**”. Output timing can be adjusted from this minimum delay up to an additional two lines in sub-pixel increments.

## **Line Sync (ADC-8032A & ADC-8032A-S)**

**Line Sync** mode uses the external reference to generate the output timing on a line-by-line basis, but uses the input signal timing to decide when a frame begins.

Whenever a signal is received, the output-timing generator waits for the next falling edge of H Sync on the external reference before displaying the incoming line. The advantage of this mode is that as long as all input sources are timed to be on the same line, the output timing stays constant, regardless of which input is selected. This is very useful in that all sources to the **ADC-8032A** (for example, from a routing switcher) only need to be lined up to the same line.

The **Line Sync** mode has internal latency, so that using minimum delay still means that the output video will not be lined up with the external reference. To do so would have added even more latency, which would not be desirable. However, output timing can be delayed by up to two lines from the minimum delay point on, in sub-pixel increments, so that the output video can be lined up as required.

### **Note**

If two input sources are not on the same line, then switching from one source to the other causes a jump in the output timing by an exact number of lines. For example, if the two sources are 2.5 lines apart, the output will jump by either 2 or 3 lines depending on the position of the sources with respect to the external reference.

## **Threshold Point**

As the input signal is delayed in time, there comes a point where the output timing will have to jump by exactly one line (the output must always come after the input). This point is called the **threshold point**. When comparing the input signal with the external reference, the threshold point is 4.25 microseconds before the falling edge of the external reference. In other words, if the input signal's falling H sync edge is 4.25 microseconds before the external reference's falling H sync edge, the input signal is said to be on the threshold point.

In addition, there is built in hysteresis so that if an input source is on the threshold point, the output timing will be constant and will not jump back and forth by a line if the input signal varies slightly. However, if the input signal is exactly on the threshold point, the output timing may vary from one power up sequence to the other. In other words, the card may power up with *different timing* than the previous time it was powered-up. To avoid this condition, it is recommended to keep the input signal away from the threshold point. One microsecond can be considered a safe distance.

### **Note**

In **Line Sync** mode, you must keep the falling H sync edge of the incoming video away from the threshold point.

## **Frame Delay (ADC-8032A-S)**

The **Frame Delay** mode is identical to the **Line Delay** mode, except that the output timing can be delayed by up to a full frame of video. By using almost a full frame of delay, it is possible to set apparent negative timing, making it look like the output occurs before the input, although delayed by 1 frame.

## **Frame Sync (ADC-8032A-S)**

The **Frame Sync** mode makes it possible to use asynchronous sources. The output timing is generated entirely based on the external reference. Whether a synchronous or an asynchronous source is used, output timing is constant. The delay through the card will be the minimum latency (in the order of microseconds) to a full frame of delay.



## Timing Modes

This section provides a summary of all Timing Modes.

### ***Line Delay***

Use when you do not have an S version and need constant delay through the card.

- Output timing based on input timing
- Ignores external reference
- Has the lowest minimum delay through the card
- Two-line output timing adjustment window

### ***Line Sync***

Use when you do not have an S version and need constant output timing even though input timing may change. **This is the recommended mode for the non-S version.**

- Output timing based on external reference (line by line only)
- If input sources are timed to be on the same line, the output timing will be constant.
- Keep input timing away from the threshold point.

### ***Frame Delay***

Use when you have an S version and need constant delay through the card.

- Output timing based on input timing.
- Ignores external reference.
- Has the lowest minimum delay through the card.
- Output timing adjustment window has infinite phasing over a full frame.

### ***Frame Sync***

Use when you have an S version and need constant output timing, or when the input is asynchronous to house reference.

- Input can be asynchronous.
- Output timing is constant, regardless of input timing.
- Output phasing is infinite over a full frame, and the delay through the card varies from the minimum processing delay up to the minimum processing delay plus a full frame.

### Bank C-1: Timing Mode Procedure

Use the following steps to set the timing mode:

1. Select Bank C, and rotate **Function Select** to position 1.
2. Select the desired timing mode according to the following table.
  - Toggle **Mode Select** *up* to advance up the list.
  - Toggle **Mode Select** *down* to descend down the list.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default	
C	1	+	Frame Sync *	TIME MODE FS	LS (FS on S models)
			Frame Delay *	FD	
			Line Sync	LS	
		-	Line Delay	LD	

\* Indicates ADC-8032A-S only

### Bank C-2: H Delay

Use the following steps to adjust the output's H Delay:

1. Select Bank C, and rotate **Function Select** to position 2.
2. Increase or decrease the H Delay as required:
  - Toggle **Mode Select** *up* to increase H Delay by half a pixel (one 27MHz-clock period) with each toggle.
  - Hold **Mode Select** *up* to increase H Delay continuously.
  - Toggle **Mode Select** *down* to decrease H Delay by half a pixel (one 27MHz-clock period) with each toggle.
  - Hold **Mode Select** *down* to decrease H Delay continuously.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
C	2	+	Increase	H DELAY (#)
		-	Decrease	

Please note the following important points regarding H Delay:

- If you cross over the maximum H Delay, the value returns to 0 (zero) and the V Delay value increments by 1.
- Crossing the minimum delay returns the H Delay value to 1715 (NTSC) or 1725 (PAL) and decrements the V Delay value by 1.
- Sub-pixel timing adjustments can be made using the **RV1 Fine Phase Adjust** potentiometer on the front edge of the card. Turning the pot clockwise increases delay, whereas turning it counter-clockwise decreases the delay. The range is approximately 45 ns, which is slightly longer than the step size of the H Delay function.

### Bank C-3: H Reset

Use the following steps to reset just the H Delay value to 0 (zero). This function is particularly useful if your adjustment range is far off the mark, or if you simply want to quickly return to zero.

1. Select Bank C, and rotate **Function Select** to position 3.
2. Reset H Delay as required:
  - Toggle **Mode Select up** to reset H Delay to 0.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
C	3	+ Zero - No action	H RESET ZERO	N/A

### Bank C-4: V Delay

Use the following steps to adjust the output's V Delay:

1. Select Bank C, and rotate **Function Select** to position 4.
2. Increase or decrease the V Delay as required:
  - Toggle **Mode Select up** to increase V Delay by one line.
  - Hold **Mode Select up** to increase V Delay continuously.
  - Toggle **Mode Select down** to decrease V Delay by one line.
  - Hold **Mode Select down** to decrease V Delay continuously.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
C	4	+ Increase - Decrease	V DELAY (#)	0

### Bank C-5: V Reset

Use the following steps to reset just the V Delay value to 0 (zero).

1. Select Bank C, and rotate **Function Select** to position 5.
2. Reset V Delay as required:
  - Toggle **Mode Select up** to reset V Delay to 0.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
C	5	+ Zero - No action	V RESET ZERO	N/A

### Bank C-6: Set Minimum Delay

Use the following steps to reset both the H Delay and V Delay values to 0 (zero).

1. Select Bank C, and rotate **Function Select** to position 6.
2. Reset all delays as required:
  - Toggle **Mode Select** *up* to reset H Delay and V Delay to 0.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
C	6	+ Zero - No action	MIN DEL    ZERO	N/A

### Bank C- 7: Input Mode

The **Input Mode** function selects what type of video is being input. The choices are:

- **Standard** – standard
- **VTR** – input signals that do not have a stable timebase, such as from VTR's or VCR's

When VTR is selected as the video Input Mode, an external reference is required to reclock the input signal to the house clock. The external reference provides stable output timing.

Use the following steps to set the Input Mode:

1. Select Bank C, and rotate **Function Select** to position 7.
2. Select the desired Input mode according to the following table.
  - Toggle **Mode Select** *up* to set VTR mode
  - Toggle **Mode Select** *down* to set STANDARD mode.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
C	7	+ VTR mode - STANDARD mode	IN MODE    VTR STAND	STAND

**Note**

A reference must be connected when in **VTR Mode**.

**Note**

A reference must be connected when in **VTR Mode**. This mode affects the **Hotswitch Mode**. Timebase error-prone signals such as from a VCR will falsely trigger the hotswitch detector. Thus, an **Input Mode** selection of VTR will force the **Hotswitch Mode** to OFF.

### Bank C-8: Freeze Mode

The input image can be frozen (**ADC-8032A-S** only) if any of the following conditions occur:

- The user selects Manual Freeze (**Forced Freeze**, Bank C, Position 9)
- There is a loss of input signal (**Input Loss Mode**, Bank C, Position A)
- A hotswitch occurs (**Hotswitch Mode**, Bank C, Position B)

The **Freeze Mode** function allows you to set the *type* of freeze that occurs: Field 1, Field 2, or Full Frame. Use the following steps to set the freeze mode:

1. Select Bank C, and rotate **Function Select** to position 8.
2. Select the desired mode according to the table below:
  - Toggle **Mode Select** *up* to advance up the list.
  - Toggle **Mode Select** *down* to descend down the list.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default	
C	8	+	Frame	FRZ MODE	FLD 1
			Field 2	FRAME	
		-	Field 1	FLD 2	
				FLD 1	

### Bank C-9: Forced Freeze

The output can be *manually* frozen (**ADC-8032A-S** only) using the **Forced Freeze** mode. When enabled, the freeze will affect either field 1, field 2 or the entire frame (as determined by the **Freeze Mode** function).

Use the following steps to enable or disable the Forced Freeze mode:

1. Select Bank C, and rotate **Function Select** to position 9.
2. Select the desired mode:
  - Toggle **Mode Select** *up* to freeze the image. The **FREEZE** LED is on.
  - Toggle **Mode Select** *down* to un-freeze the image, and allow input video to pass through. The **FREEZE** LED is off.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default	
C	9	+	Freeze	FREEZE	FORCE
		-	Pass Through		PASS

### Bank C-A: Input Loss Mode

The **Input Loss Mode** function selects what type of video appears at the system's four outputs when the input signal is lost or invalid. These choices are available:

- **Black** - SDI black.
- **No Output** - flat line, no signal present.
- **Freeze** - the last valid image is automatically frozen (**ADC-8032A-S** only). The freeze will affect either field 1, field 2 or the entire frame (as determined by the **Freeze Mode** function).
- **Re-initialize** – the card will re-initialize itself every 1.5 seconds. (This option may be removed on future revisions.)

When a valid input signal is restored, the **Input Loss Mode** setting is ignored. Use the following steps to set the Input Loss Mode:

1. Select Bank C, and rotate **Function Select** to position A.
2. Select the desired mode according to the table below:
  - Toggle **Mode Select** *up* to advance up the list.
  - Toggle **Mode Select** *down* to descend down the list.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
C	A	+ Freeze No Output - Black	IN LOSS RE-INIT FREEZE NO OUTPUT BLACK	BLACK

#### Important

It is recommended that the **Hotswitch Mode** and **Input Loss Mode** be set the same with either: both set to freeze, or both set to black. There is circuitry in the sync stripper that removes unwanted impulses to make the circuit more noise tolerant. During a hotswitch, this could cause the **ADC-8032A** to interpret the signal has been lost. Since the Input Loss mode overrides the Hotswitch mode setting, having one set to freeze and the other set to black could lead to a momentary glitch on the screen.

### Bank C-B: Hotswitch Mode

The **ADC-8032A** uses a phase-locked-loop (PLL) to synchronize its pixel clock to the incoming signal's line rate. Because of this, any disturbance to the incoming line rate, such as an untimed switch outside the lock window of the PLL, will cause the PLL to lose lock. It can take several fields before the PLL can regain lock, and until it does so, the decoder cannot properly decode the incoming video. The result is that untimed switches will result in a disruption to the output video.

To mask this disruption, a hotswitch mode was created. This is accomplished by momentarily freezing the last good frame, or momentarily going to black while the untimed switch occurs. Going to black is recommended since the output can be forced to black as soon as the hotswitch condition is detected. Freezing must wait until the next field, in which case a single corrupted field could get through to the output.

In Frame Sync, the output timing will be undisturbed as it is based on the external reference. In Line Sync mode, as long as the input sources are on the same line relative to the external reference, and they do not cross the threshold point (see Bank C-1 Timing Mode for details on the threshold point),

then the output timing will also be undisturbed. In all other cases, the output timing will be disturbed any time an untimed switch is made at the input of the **ADC-8032A**. This function *sets* the mode or disables it. Three choices are available:

- **Off** - disables the Hotswitch Mode.
- **Black** - the output momentarily cuts to black when an untimed switch is made at the input.
- **Freeze** - (**ADC-8032A-S** only) the last valid image is momentarily frozen. The freeze will affect either field 1, field 2 or the entire frame (as determined by the **Freeze Mode** function).

In either case, the output returns once the card has synchronized to the input. Use the following steps to set the Hotswitch Mode:

1. Select Bank C, and rotate **Function Select** to position B.
2. Select the desired mode according to the table below:
  - Toggle **Mode Select** *up* to advance up the list.
  - Toggle **Mode Select** *down* to descend down the list.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default	
C	B	+	Freeze	HOTSW MD FREEZE	OFF
			Black	BLACK	
		-	Off	OFF	

**Note**

Freeze hotswitching is not supported in **Line Delay**, **Line Sync** and **Frame Delay** timing modes. If one of these timing modes is selected and freeze hotswitching is enabled, the hotswitch will go to black instead.

**Important**

Because output timing is disrupted in **Line Delay** and **Frame Delay** modes, hotswitching is not guaranteed to go completely black. These two timing modes should never be used if the input source is switched while on air, since the output timing will be affected, and this could affect equipment downstream of the **ADC-8032A**.

**Important**

It is recommended that the **Hotswitch Mode** and **Input Loss Mode** be set the same with either: both set to freeze, or both set to black. There is circuitry in the sync stripper that removes unwanted impulses to make the circuit more noise tolerant. During a hotswitch, this could cause the **ADC-8032A** to interpret the signal has been lost. Since the Input Loss mode overrides the Hotswitch mode setting, having one set to freeze and the other set to black could lead to a momentary glitch on the screen.

**Important**

Timebase error-prone signals such as from a VCR will falsely trigger the hotswitch detector. Thus if the **Input Mode** is set to VTR it forces the **Hotswitch Mode** to OFF.

### **Bank C-C: Forced Black**

This selection forces the output to black (SDI). Use the following steps to enable or disable the Forced Black mode:

1. Select Bank C, and rotate **Function Select** to position C.
2. Select the desired mode according to the table below:
  - Toggle **Mode Select** *up and hold for one second* to force the output to black.
  - Toggle **Mode Select** *down* to disable the Forced Black mode.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
C	C	+ (h) On - Off	FRCD BLK ON OFF	OFF

### **Bank C-D: Forced Mono**

This selection forces the output to monochrome (SDI). Use the following steps to enable or disable the Forced Monochrome mode:

1. Select Bank C, and rotate **Function Select** to position D.
2. Select the desired mode according to the table below:
  - Toggle **Mode Select** *up and hold for one second* to force the output to monochrome.
  - Toggle **Mode Select** *down* to disable the Forced Monochrome mode.

Bank	SW1 Function Select	SW2 Mode Select	Heads-Up Display Label	Default
C	D	+ (h) On - Off	FRCD MONO ON OFF	OFF



# SMPTE 269M Fault Reporting

## In This Chapter

This chapter contains the following sections:

- Overview
- Jumper Setup
- Frame Connections
- Details

## Overview

The SMPTE 269M Fault Reporting system, also known as an SMPTE “alarm”, provides indication if one or more frame modules encounter a fault or an abnormal condition. The ADC-8032A module provides a jumper to enable SMPTE-269M fault reporting. The card connects by means of an internal interface circuit to an auxiliary telco connector on RossGear 8000 series frames. When the frame connection is interfaced with a customer-designed system of LEDs or audible alarms, faults can be traced to a specific frame when a card fault occurs within that frame.

The following diagram illustrates a general arrangement for SMPTE 269M alarm reporting:

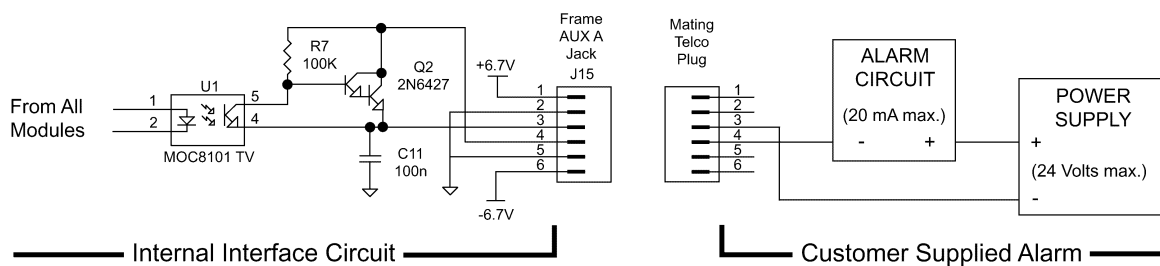


Figure 5. SMPTE 269M Alarm Reporting: Internal interface and typical connections

## Jumper Setup

If fault reporting for the ADC-8032A is desired, use jumper **JP4 - 269M Fault Report** to set up the card.

1. To access the jumper, remove the card from the frame by pressing down the white card ejector tab and pulling the card from the frame slot.
2. Observing all static discharge and handling precautions, place the card with the component side facing up on a clean flat surface.
3. To enable SMPTE fault reporting, set jumper **JP4** to **EN** position. See the Jumper Setup section in Chapter 2 “**Installation and Setup**”.
4. To disable SMPTE fault reporting, set jumper **JP4** to **DIS** position. See the Jumper Setup section in Chapter 2 “**Installation and Setup**”.
5. To return the card to the designated frame installation slot, hold the ADC-8032A card by the edges and carefully align the card edges with the slots in the frame. Then fully insert the card into the frame until the rear connection plug is properly seated.

## Frame Connections

The SMPTE 269M Fault Reporting connection on RossGear 8000 series frames is provided by the auxiliary telco connector, **AUX A**, for interfacing with a customer-designed alarm system.

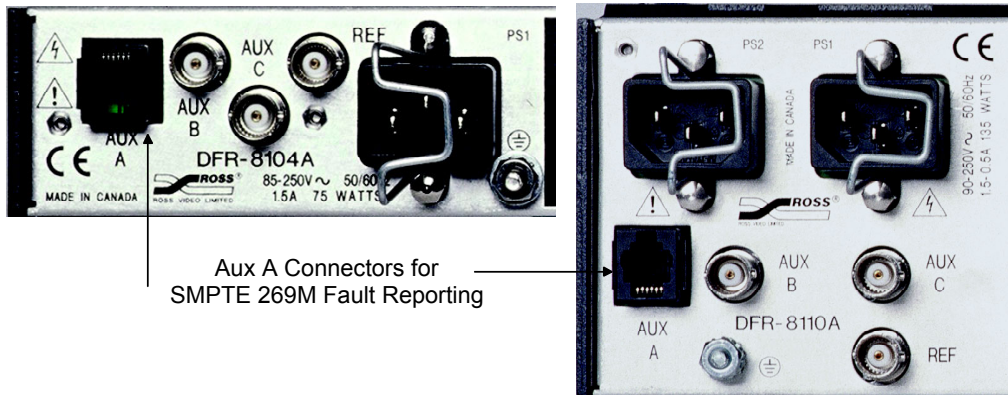


Figure 6. SMPTE 269M Alarm Reporting Frame Connections

Connect the frame’s **AUX A** connector to your facility’s SMPTE alarm circuit.

## Details

The fault report contacts are closed when the card detects an internal failure or a power loss condition. Some internal failures are:

- Failure of the card to initialize
- Failure in the fault reporting circuitry
- Failure to detect a valid analog input signal to the card

For additional information on alarm system design, refer to the SMPTE document *ANSI/SMPTE 269M - 1994*.

# Comlink

---

## In This Chapter

This chapter contains the following sections:

- Overview
- Cable Construction
- Connection and Configuration

### Overview

The board's Terminal Display feature uses the Comlink BNC (7) to establish a connection between a PC and the ADC-8032A. When properly connected, you can view your setup parameters on a PC running VT-100 terminal emulation. All tables are output in ASCII format using an RS-485 interface. Because of the nature of the frame, it is not possible to have a true differential signal. In this situation, using a BNC on the frame side, the connection is single-ended. Only the center conductor carries information, while the shield is grounded.

#### Important!

Ensure that the PC and the card frame are at the same ground potential in order to avoid ground loops.

Although the interface is RS-485, the Comlink can function with most modern RS-232 equipment, thereby making it easy and convenient to use with standard PC COM ports. To connect the Comlink between the ADC-8032A and your PC, you require a coax adapter cable with a BNC connector at one end, and either a 9-pin or 25-pin RS-422 or RS-232 connector at the other end.

## Cable Construction

Construct a custom coax cable adapter as follows:

- On the **Frame** end of the coax cable, no change to the BNC cable is required. Ensure that the pin and shield are properly connected.
- On the **PC** end of the cable, make the following connections according to whether your PC port uses a 9-pin “D” or a 25-pin “D” connector:

### Important!

Regardless of whether your PC port uses a 9-pin “D” or a 25-pin “D” connector, the pin-out configuration may vary. Always check your PC’s **Technical Guide** to determine the correct pin-outs for your computer. The **RX** and **GND** pin-outs will vary from machine to machine.

### 9-Pin Connections

The following diagram illustrates a *sample* connection using a *typical* pin-out configuration for a PC’s 9-pin D-type connector.

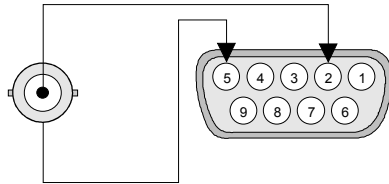


Figure 7. D-9 to BNC Connections

1. Connect the center conductor of the coax to the pin 2 (**RX**) on your serial port connector.
2. Connect the shield of the coax to the ground pin 5 (**GND**) on your serial port connector.

### 25-Pin Connections

The following diagram illustrates a *sample* connection using a *typical* pin-out configuration for a PC’s 25-pin D-type connector.

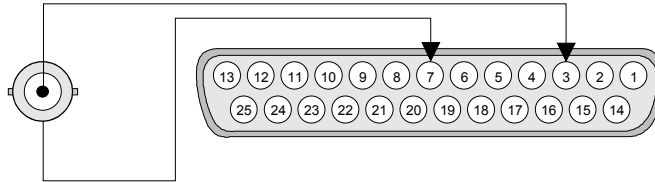


Figure 8. D-25 to BNC Connections

1. Connect the center conductor of the coax to the pin 3 (**RX**) on your serial port connector.
2. Connect the shield of the coax to the ground pin 7 (**GND**) on your serial port connector.

## Connection and Configuration

Once you have constructed the Comlink adapter cable, connect it and configure the PC as follows:

1. Connect the cable between your PC's serial port and BNC 7 on the rear panel of the ADC-8032A.
2. With the custom cable properly connected, set up your PC's serial port parameters as follows:
  - 19.2 K baud rate
  - 8 data bits
  - No parity
  - 1 stop bit
  - No flow control
3. On your PC, run a program that uses VT-100 terminal emulation, such as **Terminal.exe** or **HyperTerminal**. With the ADC-8032A powered up, you should now have all setup parameters visible on the PC, as illustrated in the sample screen below.

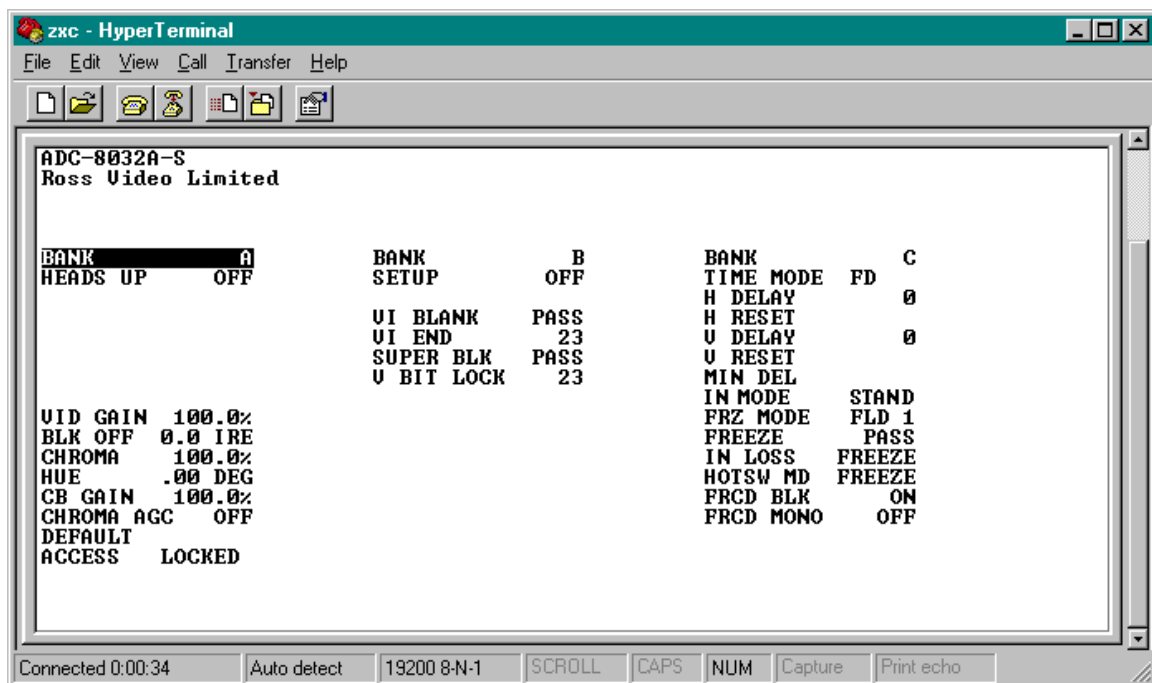


Figure 9. Sample Terminal Display



# Specifications

---

## In This Chapter

This chapter contains the Technical Specifications table.

# Technical Specifications

Table 6. ADC-8032A - Technical Specifications

Category	Parameter	Specification
<b>Composite Video Input</b>	Signal Standards Accepted	NTSC, PAL, PAL-M, PAL-N
	Number of Inputs	1
	Composite Video	1V p-p nominal
	Input Impedance	75Ω terminating
	Return Loss	>48dB to 6MHz
	Common Mode Rejection	>52dB @ 50/60Hz
<b>Component SDI Output</b>	Signal Standards	SMPTE 259M-C, 270Mb/s 525/625 lines, 10 bits
	Number of Outputs	4
	Output Return Loss	>18dB to 270MHz
	Signal Level	800mV ± 5%
	DC Offset	< 30mV
	Rise and Fall Time	>800pS (20 - 80%, ±15%)
	Overshoot	<10% typical
<b>Analog Reference</b>	Signal Standards Accepted	NTSC, PAL, PAL-M, PAL-N
	Number of Inputs	1
	Input Impedance	75Ω
	Return Loss	>40dB to 5MHz
<b>Performance</b>	Luminance Frequency Response	± 0.25dB to 5MHz, < -0.8dB @ 5.75MHz
	RMS SNR, Luma Channel	> 56dB to 5.5MHz, unweighted
	RMS SNR, Chroma Channel	> 56dB to 5.5MHz, unweighted
	H and V phasing	Infinite with frame sync, 2 lines without frame sync
<b>Minimum Delay in Line/Frame Delay Mode</b>	Minimum Delay	3 Line + 23μS
<b>Power Consumption</b>	Total	7.9W
<b>TTL Tracking Delay Pulse</b>	ADC-8032A	up to 2 video lines
	ADC-8032A-S	up to 2 video fields

Specifications are subject to change without notification



# Ordering Information

---

## In This Chapter

This chapter contains:

- Ordering information for the ADC-8032A and related products
- Contact information for Ross Video
- Warranty and Repair Policy

### ADC-8032A and Related Products

#### *Standard Equipment*

- **ADC-8032A** Analog Composite to SDI Decoder\*
- **ADC-8032A-S** Analog Composite to SDI Decoder with Frame Synchronizer\*

#### *Optional Equipment*

- **8032AD-004** Analog Composite to SDI Decoder User Manual (additional User Manual)
- **FSU-8032A** Frame Synchronizer Upgrade (replacement microprocessor for adding Frame Sync function to standard ADC-8032A)
- **EXT-8100** Extender Board (module servicing extension)
- **DFR-8104A** Digital Products Frame and Power Supply (PS-8102)\* (1RU, holds 4 modules, includes 1 power supply)
- **DFR-8104A-C** Digital Products Frame with Cooling Fan Module and Power Supply (PS-8102)\* (1RU, holds 4 modules, includes 1 power supply)
- **DFR-8110A** Digital Products Frame and Power Supply (PS-8102)\* (2RU, holds 10 modules, includes 1 power supply)
- **DFR-8110A-C** Digital Products Frame with Cooling Fan Module and Power Supply (PS-8102)\* (2RU, holds 10 modules, includes 1 power supply)
- **CFM-8104A** Cooling Fan Module (upgrade cooling kit for standard DFR-8104A)

- **CFM-8110A** Cooling Fan Module  
(upgrade cooling kit for standard DFR-8110A)
  - **PS-8102** Power Supply (85-264 volts)  
(redundancy option power supply for Ross 8000 series 2RU digital product frames)
  - **FSB-7110** Rear Support Bars and Brackets  
(additional support for rear frame-to-rack mounting)
  - **CRB-8110A** Card Retaining Bracket  
(module retainer used in field installations such as mobile trucks etc.)
  - **CSB-8100** Cable Support Bracket  
(cable support bar for rear of digital frames)
- \* One User Manual is supplied with each of these RossGEAR products.

Your **ADC-8032A Analog Composite to SDI Decoder** is part of the RossGEAR family of products. Ross Video Limited offers a full line of RossGEAR Digital Terminal Equipment including Distribution, Conversion, Monitoring, Synchronizers, Encoders, Decoders, AES, Keyers, Control Switchers, as well as Analog Audio and Video products.

## Warranty and Repair Policy

The RossGear ADC-8032A 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 RossGear ADC-8032A 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 RossGear ADC-8032A has failed after your warranty period has expired, we will repair your defective product for as long as suitable replacement components are 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 RossGear ADC-8032A Analog Composite to SDI Decoder User Manual of our Digital Products line provides all pertinent information for the safe installation and operation of your RossGear Product. Ross Video policy dictates that all repairs to the RossGear ADC-8032A 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 RossGear ADC-8032A, 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 RossGear ADC-8032A. A temporary replacement module, if required, 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 this equipment.

**Notes:**

# Contact Us

Contact our friendly and professional support representatives for the following:

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

<b>PHONE</b>	<b>General Business Office and Technical Support</b>	613 • 652 • 4886
	<b>After-hours Emergency</b>	613 • 652 • 4886 ext. 333
	<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

## Visit Us

Please visit us at our website for:

- Company information
- Related products and full product lines
- On-line catalog
- Trade show information
- News
- Testimonials
- EFD-compliant product information (Engineer Friendly Documentation)



(EFD is a project promoted by SBE to provide a web-based platform for the open sharing of technical specifications between manufacturers and engineers, using an XML formatted set of suggested templates, to make it easier for engineers to find the technical information they need to plan a smooth project. Ross Video Limited is proud to support our broadcast industry engineers by participating in this important initiative.)

[www.rossvideo.com](http://www.rossvideo.com)