
SRG-2200 User Guide

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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

Ross has become well known for the Ross Video Code of Ethics. It guides our interactions and empowers our employees. I hope you enjoy reading it below.

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



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Ross Video Code of Ethics

Any company is the sum total of the people that make things happen. At Ross, our employees are a special group. Our employees truly care about doing a great job and delivering a high quality customer experience every day. This code of ethics hangs on the wall of all Ross Video locations to guide our behavior:

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

SRG-2200 · User Guide

- Ross Part Number: 2200DR-104-06
- Release Date: January 11, 2021.

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Patents

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

Notice

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Safety Notices

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

Maintenance/User Serviceable Parts

Routine maintenance to this Ross Video product is not required. This product contains no user serviceable parts. If the product does not appear to be working properly, please contact Technical Support using the numbers listed under the “**Contact Us**” section of this manual. This product is covered by a generous 1-year warranty and will be repaired without charge for materials or labor within this period. See the “**Warranty and Repair Policy**” section in this guide for details.

Environmental Information

The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

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

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



If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You can also contact Ross Video for more information on the environmental performances of our products.

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Introduction

This guide covers the installation, configuration, and use of the SRG-2200 Master Reference and Test Signal Generator. The following chapters are included:

- “**Introduction**” summarizes the guide and provides important terms, and conventions.
- “**Before You Begin**” provides a brief product overview and installation requirements for the SRG-2200.
- “**Hardware Overview**” outlines the front and rear panel features of the SRG-2200.
- “**Physical Installation**” provides instructions for the basic physical installation of the SRG-2200.
- “**Functional Check Procedures**” guides you through the steps required to check the operation of the SRG-2200.
- “**DashBoard Menus**” summarizes the DashBoard menu system available.
- “**Upgrading the Software**” outlines the steps necessary to upgrade the software programmed on the main module.
- “**Troubleshooting**” provides troubleshooting guidance for the SRG-2200, instructions on how to upgrade the software on the SRG-2200, and how to replace a failed power supply unit.
- “**Specifications**” provides the specifications for the SRG-2200.
- “**Certifications and Compliances**” provides information about the standards the SRG-2200 conforms to.
- “**Characters for Idents**” lists the characters in idents come from an intersection list of the first 256 characters from Unicode and the allowable characters in XML 1.1
- “**Test Patterns**” provides an overview of the test patterns available for the SRG-2200.
- “**NTP Option**” provides a general overview of how to set up the NTP option.
- “**Date in the User Bits of Timecode**” provide an overview of how the SRG-2200 inserts and reads the user bits in time code to decode date and time zone information.
- “**Service Information**” provides information on the warranty and repair policy for your SRG-2200.
- “**Glossary**” provides a list of terms used throughout this guide.

Related Publications

It is recommended to consult the following Ross documentation before installing and configuring your SRG-2200:

- *ACO-2200 Quick Start Guide*, Ross Part Number: 2200DR-002
- *ACO-2200 User Guide*, Ross Part Number: 2200DR-004
- *SRG-2200 Quick Start Guide*, Ross Part Number: 2200DR-102

Documentation Conventions

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

Interface Elements

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

In the **Edit** dialog, click **Insert Above**.

User Entered Text

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

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

Referenced Guides

Italic text is used to identify the titles of referenced guides, manuals, or documents. For example:

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

Menu Sequences

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

The term **[Confirm]** indicates that you should press the Rotary Control, and **[Back]** indicates that you should press the blue push-button.

Important Instructions

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

- ★ Contact your IT department before connecting to your facility network to ensure that there are no conflicts. They will provide you with an appropriate value for the IP Address, Subnet Mask, and Gateway for your SRG-2200.

Contacting Technical Support

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

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

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

Before You Begin

The SRG-2200 is designed for high stability multi standard Master Sync operation. The product can provide a wide range of accurate reference signals including analog composite video, analog composite black-burst, tri-level sync, SD, HD and 3G serial digital (SDI) video, and SD, HD, and 3G SDI black. Additionally, there are AES/EBU digital audio outputs, DARS, Word clock and Timecode outputs.

The SRG-2200 is a Composite SPG with multiple Color Black and SD-SDI outputs. The Color Black outputs are configured to be capable of providing tri-level syncs.

Additional options above the base configuration are enabled using special Option Keys. These options are NTP (SRG-2200-NTP).

The SRG-2200 comes standard with external dual power supply units (PSU) which can be “hot-swapped” should problems be encountered.

A companion automatic changeover unit, the ACO-2200, is also available.

Features

The SRG-2200 includes the following:

- High Stability Internal Reference
- Genlock to the NTSC/PAL Black-Burst signals
- 1 Composite Analog Video output
- 1 Serial Digital Video signal outputs + 1 SDI Black output
- 2 Independent Pattern Generators
- 2 Independent Monochrome ID text Ident and Monochrome Logo Generators supporting international characters
- 3 Independent and Timeable Black-Burst or Tri-Sync Generators
- 6 Independent channels of Timecode: 1 Longitudinal Timecode (LTC) output, 1 SDI VITC / ATC, and 4 Analog Video VITC
- 36 channels of Audio: 16 channels of Embedded Audio in SDI 1 and SDI 2, 4 channels of Audio in 2 AES/EBU Serial Digital Audio outputs (2 BNC)
- 48 kHz or 44.1 kHz Word Clock output
- Ethernet (100 BASE-T) Interface for connection to the DashBoard Control System
- No fans
- N+1 external power redundancy
- Tight integration with the ACO-2200 Channel Changeover unit
- 3-year transferable warranty

Functional Block Diagrams

The SRG-2200 produces a wide variety of video and audio references and test pattern signals suitable for distribution within a typical television engineering installation. This section provides the functional block diagrams that outline the work flow of the SRG-2200.

The SRG-2200 can be configured in a number of ways:

- Free Run, or Genlock / Time-Lock to a selection of sources
- Configurable Video Outputs (Format, Ident, Timecode, Audio, etc.)
- Ethernet connectivity for full remote control via DashBoard, and software updates

For More Information on...

- the configuration parameters within entire menu system, refer to the section “**DashBoard Menus**” on page 33.

Inputs, and Audio Generator

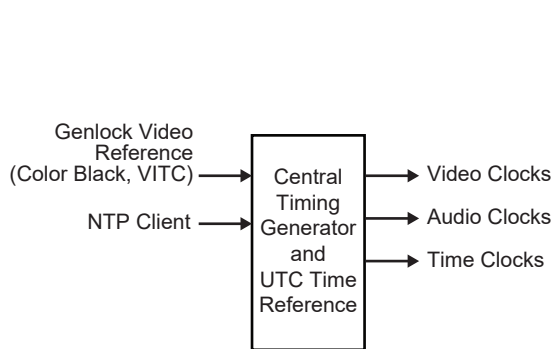


Figure 2.1 Central Timing Generator

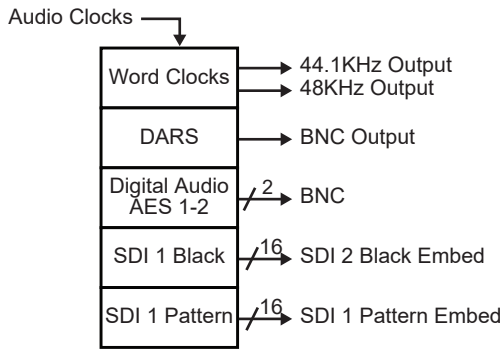


Figure 2.2 Audio Generator

SDI Outputs

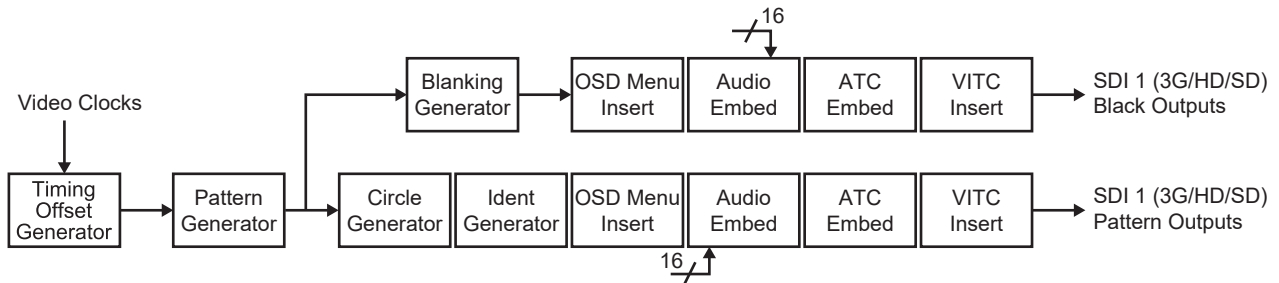


Figure 2.3 SDI Outputs

Composite Pattern and Tri-Sync/Composite Black Outputs

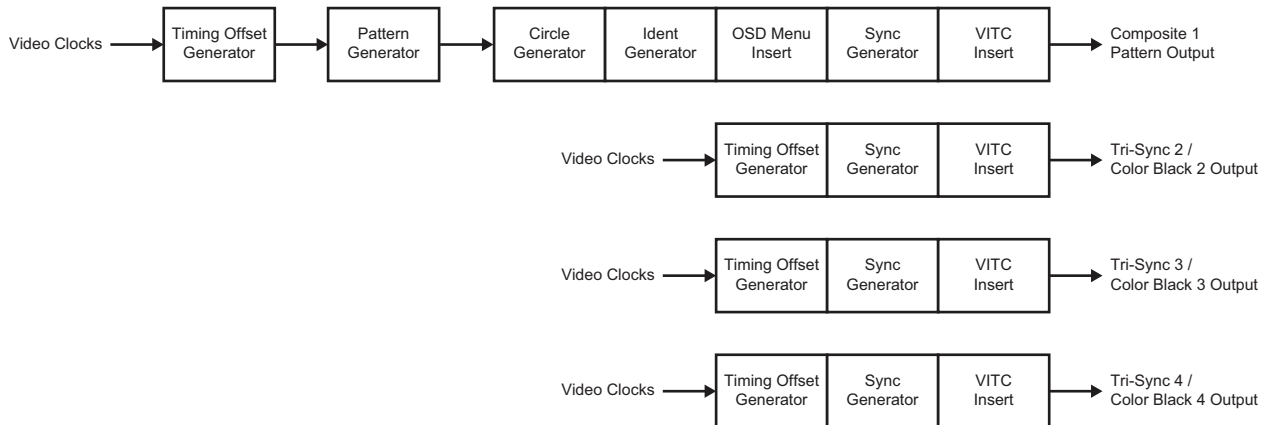


Figure 2.4 Composite Pattern and Tri-Sync/Composite Black Outputs

Timecode

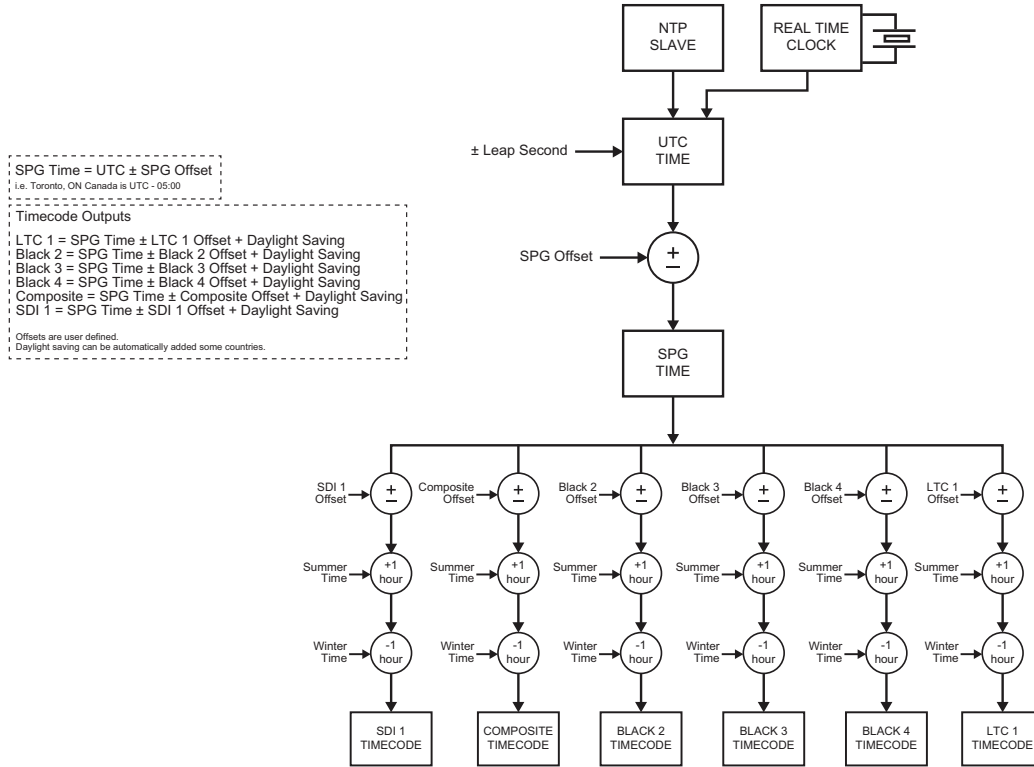


Figure 2.5 Timecode

Signal Processing Modules

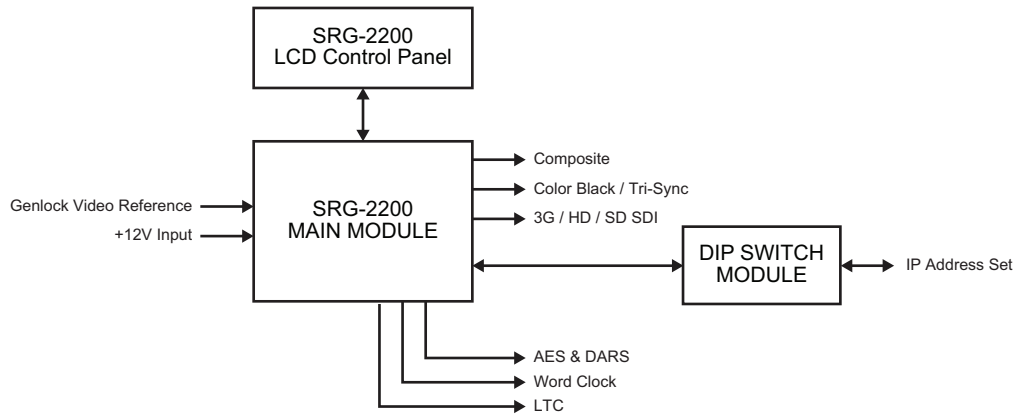


Figure 2.6 Signal Processing

Hardware Overview

This chapter outlines the front and rear panel features of the SRG-2200.

Front Panel Overview

Figure 3.1 shows the SRG-2200 Front Panel. Descriptions of the Front Panel controls and indicators appear below.

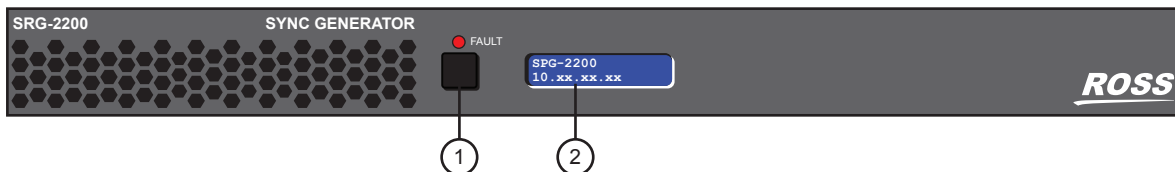


Figure 3.1 SRG-2200 — Front Panel

- | | |
|--------------------------------------|----------------|
| 1) Push Button and FAULT LED Control | 2) LED Display |
|--------------------------------------|----------------|

1. Push Button and FAULT LED Control

Press this button while the LED is cycling through status messages to move to the Fault status report list and sequence through it.

The red LED lights to indicate a fault condition.

2. LED Display

The LED display is either Static or Animated. When Animated, it cycles through a series of Status messages including the IP Address of the unit, Time, and others, including any reported Fault Status.

Rear Panel Overview

Figure 3.2 shows the SRG-2200 Rear Panel with description of the rear-panel connectors.

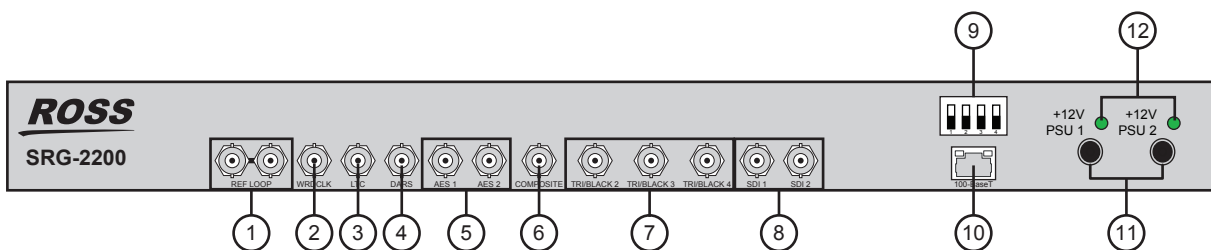


Figure 3.2 SRG-2200 — Panel

- | | | |
|--------------------------|-------------------------------|-----------------------------------|
| 1) REF LOOP Connectors | 5) AES AUDIO OUT Connectors | 9) DIP Switches |
| 2) Word Clock Connectors | 6) COMPOSITE OUT Connector | 10) ETHERNET 100-BASE T Connector |
| 3) LTC Connector | 7) TRI BLACK OUT Connectors | 11) POWER Connectors |
| 4) DARS OUT Connector | 8) SDI 1 and SDI 2 Connectors | 12) PSU Status LEDs |

1. REF LOOP Connectors

This pair of BNCs allow the input of a remote reference signal. This signal may be NTSC or PALB/G.

With the reference signal applied to one BNC, the other BNC must be terminated (or connected to another unit which is ultimately terminated).

If the SRG-2200 is to be used as a Master reference (i.e. not Genlocked), you do not have to supply a signal, and you may leave these BNCs unconnected. However, it is always wise to add a termination onto one BNC of an unused looping pair, in order to avoid having a “floating” input.

2. Word Clock Connectors

This BNC provide output of Word Clock (48 kHz or 44.1 kHz).

3. LTC Connector

This BNC provides an LTC output.

4. DARS OUT Connector

This BNC provides a DARS output.

5. AES AUDIO OUT Connectors

These 2 BNCs provide AES Audio outputs.

6. COMPOSITE OUT Connector

This BNC provides an output of the selected Analog Composite Video Pattern. The output format can be PAL, NTSC-M or NTSC-J.

7. TRI BLACK OUT Connectors

These three BNC provide outputs of either Analog Composite Video Black-Burst in PAL, NTSC-M or NTSC-J, or any one of the supported Tri-Level Sync formats.

These outputs are completely independent from each other.

8. SDI 1 and SDI 2 Connectors

These two BNCs provide the selected pattern and black output in Standard Definition, High Definition or 3G Video, in any of the supported formats. The signal format of the black output follows that of the Pattern output.

9. DIP Switches

Use the DIP switches to force the IP Address and Subnet Mask for the SRG-2200 to known values.

10.ETHERNET 100-BASE T Connector

This rear-panel connector is a standard RJ45 Ethernet connector. This connection is required for DashBoard connectivity, NTP services, software upgrades, etc.

The 100Base-T network port is used for status and control (DashBoard). In an environment where broadcast and/or multicast traffic is present e.g. PTP messaging, it is important to limit the number of broadcast and/or multicast messages that reach the 100Bast-T port to a very low number. This is normally configured in the *Storm Control* configuration of your network router. A limit of zero broadcast and/or multicast messages is recommended. If this is not available then choose < 10 broadcast and/or multicast messages per second.

11.POWER Connectors

The SRG-2200 is designed to operate from an external +12V DC power source. A safety earth stud is provided for earth bonding the chassis if you so require.

You need to provide two power connections (for the two external +12V DC Power Bricks). For full power security, these should be separate, independent and secure power grids. However, you still gain the security of power supply failure redundancy if you use the same power grid for both connections.

12.PSU Status LEDs

These LEDs indicate presence or absence of +12V.

Physical Installation

This chapter provides instructions for installing the SRG-2200.

Before You Begin

Before installing the SRG-2200, refer to the document “**Important Regulatory and Safety Notices to Service Personnel**” that accompanied your unit for general safety information.

Static Discharge

Throughout this manual, 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 SRG-2200 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.

Initial Product Inspection

Perform the following Initial Product Inspection Procedure when you receive your SRG-2200:

1. Inspect the shipping carton for external damage, which may indicate possible damage to the SRG-2200. If damage exists, document it, including photographs, to support any insurance claim.
 2. Remove the instrument from the shipping carton.
 3. Check that the SRG-2200 has not been damaged in transit. The exterior should not have any scratches or impact marks. Prior to shipment the SRG-2200 is thoroughly inspected for mechanical defects.
 4. Verify that the shipping carton contains the instrument, the standard accessories, and any optional accessories that you ordered.
 5. Perform the Functional Check Procedures as outlined in the chapter “**Functional Check Procedures**” on page 21 after installing the SRG-2200.
- ★ Save the shipping carton and packaging materials for SRG-2200 re-packaging in case return shipment becomes necessary.

Operating Environment Requirements

Verify that the location of your installation has the proper operating environment. The SRG-2200 operates correctly in ambient temperatures from 0°C to +40°C and relative humidity from 20% to 80%.

For More Information on...

- environmental operating specifications, refer to the appendix “**Specifications**” on page 59.

The SRG-2200 requires 50mm (2”) of side clearance for counter top use. Also, ensure sufficient rear clearance, e.g. 75mm (3”), so that cables are not compromised.

The SRG-2200 does not currently have an internal fan to assist with ventilation or cooling. Therefore, when you install the unit in an equipment bay, it is imperative that you ensure there is sufficient space all around the unit to allow the airflow to vent away any excess heat generated by the unit.



Caution — *The SRG-2200 could be damaged if it is powered on at temperatures or humidities outside the specified ranges.*

Rack Mount Installation

You can install the SRG-2200 into an equipment rack. It is recommended to use the rack mount kit and to loom the cables so that they do not introduce extra weight or twisting force on the front panel rack mountings or rear panel connectors. If installed in a mobile application, the rack mount kit is essential.

This section describes how to install the SRG-2200 into the rack.

Installing the SRG-2200 into a Rack Unit

The SRG-2200 mounts in the rack cabinet by means of four screws through the front mounting flanges. This should normally be sufficient to carry the load, including weight of cables. Refer to the *SRG-2200 Quick Start Guide* for mounting details.

Installing the Rear Support Brackets



Warning — *Do not use the support brackets to carry the SRG-2200. The brackets are not primarily designed for this purpose, and property damage or personal injury may result.*

In some cases, (mobile trucks, etc.) it may be desirable to also support the rear of the SRG-2200. The rear support bars can be attached to the SRG-2200 in six possible positions. (**Figure 4.1**)

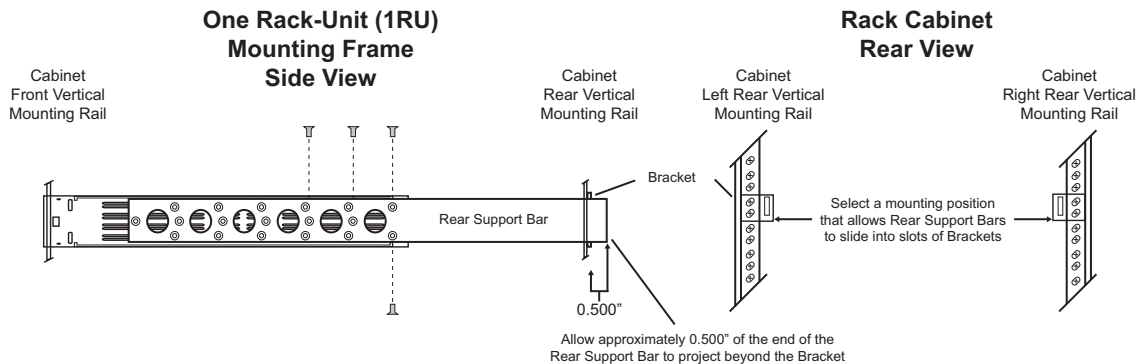


Figure 4.1 Installing the Support Brackets

To install the support brackets

1. Choose the position that suits the cabinet depth and will give approximately a 0.5” projection beyond the previously mounted bracket. The frame support bars can work with racks up to 26” deep.
2. Using four screws per bracket, as shown in **Figure 4.1**, attach both bars.
3. Mount the frame to the front rails of the rack cabinet using rack screws.
4. At the rear of the cabinet, slide the bracket slots over the rear of the support bars and secure to the cabinet rear rails with rack screws.

Connecting Power

The SRG-2200 operates from an externally supplied +12V DC power source. A safety earth stud is provided for earth bonding the chassis if you so require.

Your SRG-2200 includes 2 external +12V power supply block to provide you will full redundancy. Note that you need to provide two power connections. For full power security, these should be on separate, independent and secure power grids. However, you still gain the security of power supply failure redundancy if you use the same power grid for both connections.

Connecting the Power Cable

Connect the power cable to the instrument first, and then connect it to the AC power source. Note that connecting a live power cable causes the instrument to power on.



Caution — *The SRG-2200 does not have a power switch.*

Replacing a Power Supply

Since DC power is provided from an external supply, if you need to replace a power supply, simply replace the faulty external PSU.

Setting the Initial IP Address

The SRG-2200 is remotely controlled over an Ethernet link by a DashBoard client.

When using DashBoard to communicate with the SRG-2200, the SRG-2200 is always configured as a fixed IPv4 device using the Dashboard in conjunction with DIP switches **SW1** and **SW2** on the rear panel.

Configuring the DIP Switches

This section briefly summarizes the DIP Switch settings on the SRG-2200.

Figure 4.2 shows the DIP Switches in the **OFF** position.



Figure 4.2 DIP Switches on SRG-2200 Rear Panel

SW1 and **SW2** are used in conjunction with the DashBoard menus to set the IP Address of the card. Refer to **Table 4.1** and the rear panel labeling for DIP Switch positions.

Table 4.1 SW1 and SW2 Positions

SW1 Position	SW2 Position	Descriptions
OFF	OFF	The SRG-2200 network settings can be set by the user from DashBoard (default).
OFF	ON	No functionality.
ON	OFF	The SRG-2200 IP Address is set to 192.168.2.1 The SRG-2200 Subnet Mask is set to 255.255.255.0.
ON	ON	The SRG-2200 IP Address is set to 10.1.2.1. The SRG-2200 Subnet Mask is set to 255.255.255.0.

Accessories and Options

This section lists the standard accessories that ship with the SRG-2200 and the available software options that you can purchase.

Standard Accessories

The following accessories are shipped with the SRG-2200.

User Documentation Disc

A Documentation Resources disc was included with your SRG-2200.

DC Power Supply Bricks

Two +12V DC, 4A power supply bricks with suitable connectors are supplied with the SRG-2200.

Power Cords

All SRG-2200 are shipped with one of the following power cord options:

- Power cords for use in the United Kingdom are BS1363 approved.
- Power cords for use in North America are UL listed and CSA certified.
- Power cords for use in Europe conform to CEE7, DIN49441 and VDE standards.
- Cords for use in other areas are approved by at least one authority acceptable in the country to which the product is shipped.

Additional Software Options

You can order the following software options for your SRG-2200:

- **NTP-2200** — Enables NTP Time Synchronization

Functional Check Procedures

Perform the following procedures if you are operating the SRG-2200 for the first time (to verify that the SRG-2200 shipped without damage), or you suspect that the SRG-2200 is not working properly.

Required Equipment

The following equipment is required for the functional check:

- TV signal generator
- Multi-format waveform/picture monitors
- Serial digital video analyzer with embedded audio functionality
- Digital audio de-embedder
- AES/EBU digital audio analyzer
- Analog audio analyzer
- Oscilloscope
- 75ohm BNC cables
- 75ohm terminations
- Breakout cable/box for the rear panel 30-way multi-way connector (not supplied by Ross Video)

Before You Begin

The following procedures will guide you through the steps required to check the operation of the SRG-2200. The most common scenarios will be explored to enable the user to familiarize themselves with the operation of the unit. Although some steps are included which suggest cycling through menu options in order to check operation, this is not mandatory - a simple check for presence or absence of a signal will suffice. Full details regarding the options available in each of the menus are described in the chapter “**DashBoard Menus**” on page 33 of this manual. The scenarios to be explored are:

1. Initial Power-Up
2. Initial Configuration
3. Check Outputs
4. Time and Timecode settings
5. Genlock Mode
6. System Functions
7. Operational Configuration

Initial Power-Up

1. Connect any relevant video cables to the SRG-2200, with reference to the Rear Panel layout diagram in the section “**Rear Panel Overview**” on page 15.
2. Apply power to the SRG-2200 by connecting it to the power source(s). The instrument runs its power-on initialization process.
3. Check that no error messages appear on the LCD display.
4. Much of the functional check can be carried out immediately. However, some calibration settings are only guaranteed once functional temperature has stabilized (which should occur after 20 minutes). It is good practice to soak the instrument before proceeding.

5. User settings are made using DashBoard.

Recommendation

The SRG-2200 menu system contains an appreciable number of pre-programmed and user selectable settings. All of these settings are programmed using the factory default procedure, and a select few are then adjusted during testing and alignment. This is especially true of the Calibration menu, where settings relating to the fundamental operation of each individual SRG-2200 are stored. If memory corruption occurs, some or all of the settings may need to be re-instated.

Initial Configuration

The SRG-2200 should arrive configured to a “factory default” condition, i.e. all video outputs will have a pattern selected that is relevant to the format of the output, all of the audio channels will be configured for “1kHz Tone and Silence”, etc.

Additionally, any pre-ordered options (i.e. NTP) will have been enabled. This can be confirmed by viewing the Option Enable page in the menu; enabled options will have valid Option Keys entered for them. Refer to the section “**Slot 16: System Setup Tabs**” on page 51 for more details.

The following procedures will systematically progress through all of the outputs available from the SRG-2200. The range of menu entries available for each procedure may relate to whether associated options have been enabled.

Using DashBoard

Before proceeding, ensure that the DashBoard Control System™ is installed on a PC connected to your facility network. The DashBoard software and user manual area available from the Ross Video website.

For More Information on...

- installing DashBoard, refer to the *DashBoard User Manual*.

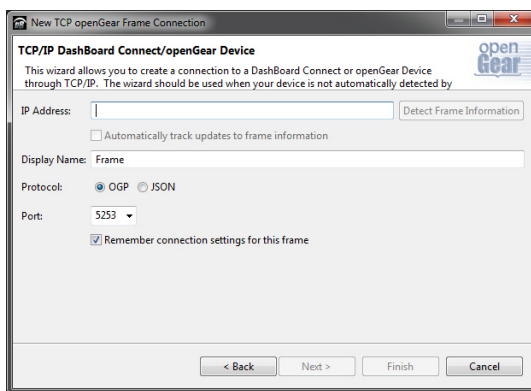
To launch DashBoard

1. Ensure that you are running DashBoard software version 8.0.0 or higher.
2. Launch DashBoard by double-clicking its icon on your desktop.

To manually add the SRG-2200 to the Basic Tree View in DashBoard

1. From the DashBoard main toolbar, select **File > New > TCP/IP DashBoard Connect or openGear Device**.

The **New TCP openGear Frame Connection** dialog opens.

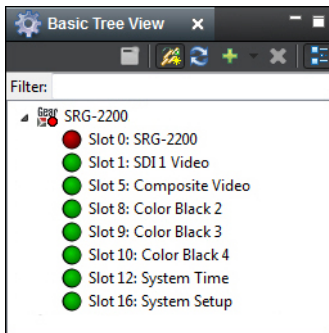


2. Type the IP address of the SRG-2200 in the **IP Address** field.
3. Type a unique name for the SRG-2200 in the **Display Name** field. This name makes the SRG-2200 easily identifiable in the Tree View.
4. Click **Finish**.

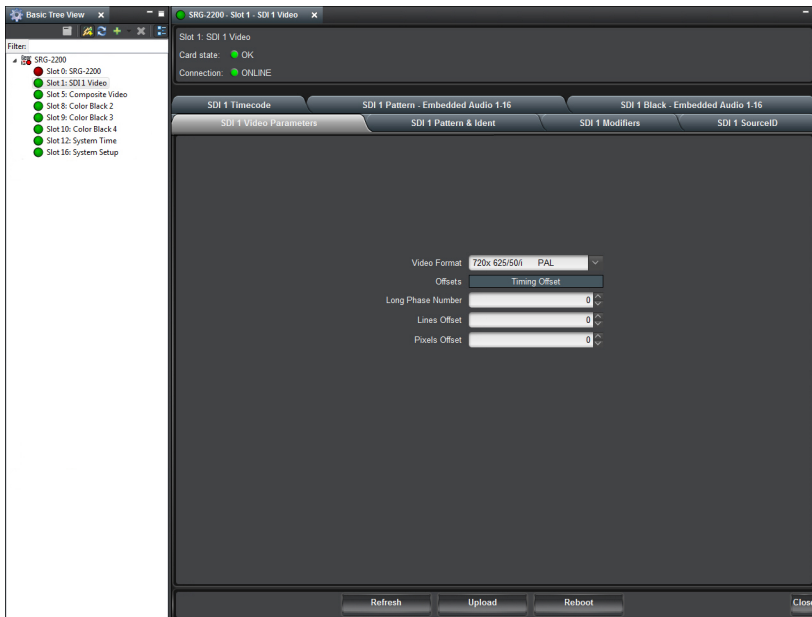
5. Ensure that the SRG-2200 is displayed in the Tree View located on the left-side of the DashBoard window. Consult the *DashBoard User Manual* should the Tree View not display the SRG-2200.

To access the SRG-2200 interfaces in DashBoard

1. From the **Tree View**, expand the node for the SRG-2200 you wish to configure.



2. Double-click a node to display its interface in the right-side of the DashBoard window.

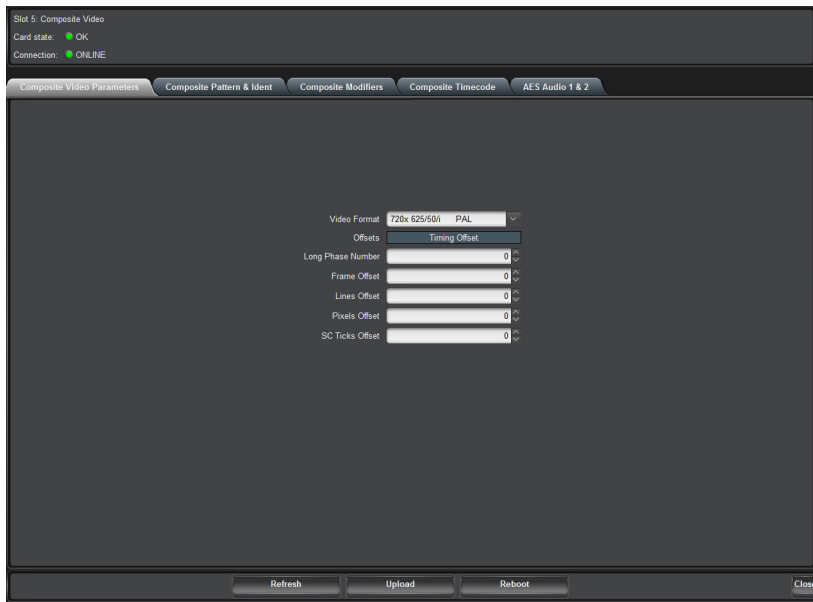


Check Outputs

The procedures in this section assume that you have launched the DashBoard client and the SRG-2200 is displayed in the Tree View.

To verify the Composite (Analog) Video Signal outputs

1. Double-click the **Slot 5: Composite Video** node.
The **Composite Video** interface displays in the DashBoard window.
2. Select the **Composite Video Parameters** tab.

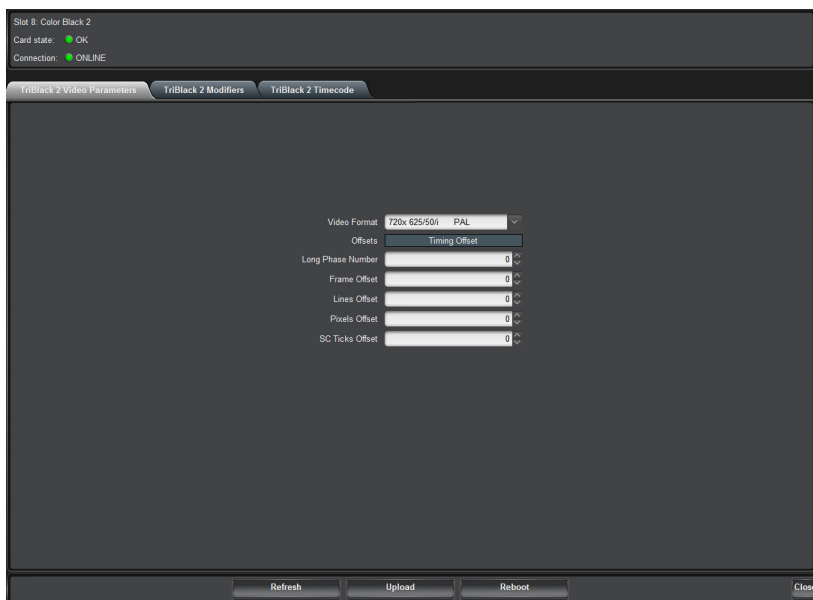


3. Connect the Composite Video output to a Waveform / Picture Monitor using a 75ohm BNC cable.
4. Set the Waveform / Picture Monitor to view the Composite signal.
5. Check that the Composite signal is as configured in the menu, and that when selecting and changing entries in the **Video Format** drop-down menu, the configuration of the Composite signal changes accordingly.

To verify the Tri-Black 2 / 3 / 4 Tri-Level Sync outputs

★ The Tri-Black 2 / 3 / 4 outputs can be configured to produce either traditional “bi-level” Color Black (i.e. PAL / NTSC) or Tri-Level syncs.

1. Double-click the **Slot 8: Color Black 2** node.
The **Color Black 2** interface displays in the DashBoard window.
2. Select the **TriBlack Video Parameters** tab.



3. Connect the Black 1 video output to the Waveform / Picture Monitor using a 75ohm BNC cable.
4. Set the Waveform / Picture Monitor to view the Black 1 signal.

5. Check that the Waveform / Picture Monitor displays the Black 1 signal selected in the Video Format menu of the **TriBlack Video Parameters** tab.
6. Check that the Black 1 signal is as configured in the menu, and that when selecting and changing entries in the **Video Format** drop-down menu, the configuration of the Black 1 signal changes accordingly.
7. Repeat 1 through 6 for **Slot:9 Color Black 3** and **Slot:10 Color Black 4**.

Serial Digital Video Signal Outputs

★ The format of the SDI 2 output follows that of the SDI Pattern output.

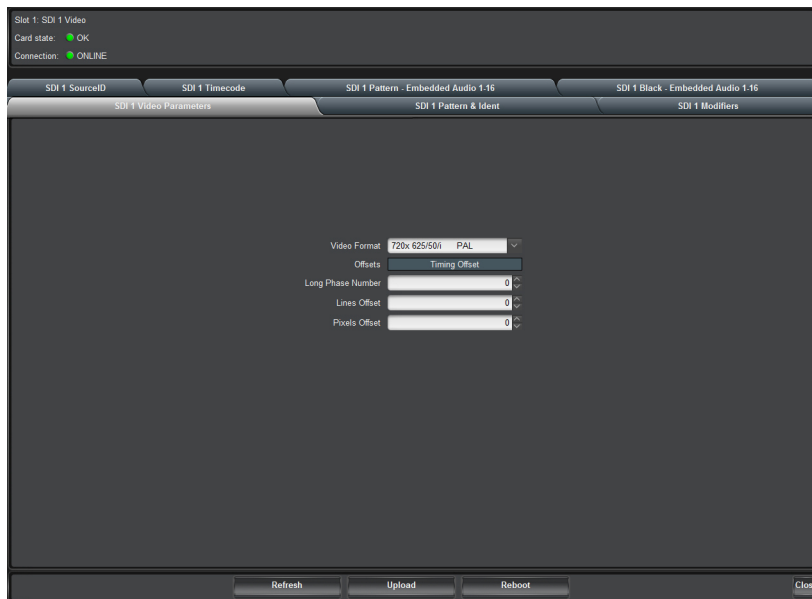
The SDI Video output channel can be configured to produce SD-SDI, HD-SDI or 3G-SDI.

To verify the serial digital video signal outputs

1. Double-click the **Slot 1: SDI 1 Video** node.

The **SDI 1 Video** interface displays in the DashBoard window.

2. Select the **SDI 1 Video Parameters** tab.



3. Connect the SDI1 Pattern output to the Serial Digital Video Analyzer using a 75ohmBNC cable.
4. Set the Serial Digital Video Analyzer to view the Serial Digital Video signal.
5. Check that the Serial Digital Video Analyzer displays the appropriate Serial Digital Video signal. If available, check the status of the Serial Digital Video signal on the Analyzer by setting it to display the relevant data.
6. Check that the Serial Digital Video signal is as configured in the menu, and that when selecting and changing entries in the **Video Format** drop-down menu, the configuration of the Serial Digital Video signal changes accordingly.
7. Move the 75ohm BNC cable to the SDI1 Black output to check the format of that is the same as the SDI1 output.
8. Repeat 4 through 6 to confirm the configuration of the SDI1 Black output.

SDI Embedded Audio Outputs

Audio channels on the SDI outputs are arranged as 8 stereo pairs on each video output:

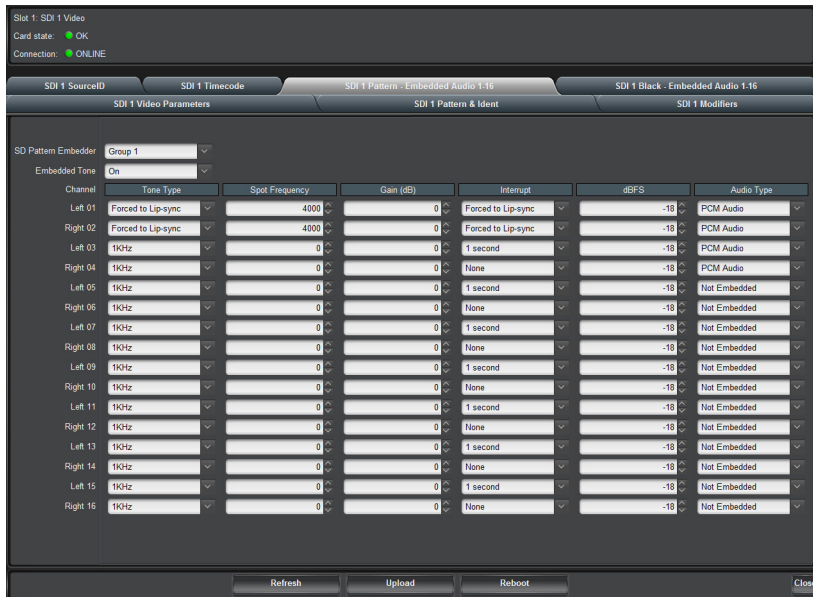
- SDI 1 Pattern 01 ... 16
- SDI 1 Black 01 ... 16

To verify the serial digital video signal outputs

1. Double-click the **Slot 1: SDI 1 Video** node.

The **SDI 1 Video** interface displays in the DashBoard window.

2. Select the **SDI 1 Pattern 1 - Embedded Audio 1-16** tab.



3. Connect the SDI1 video output to the Serial Digital Video Analyzer or to a Digital Audio De-Embedder using a 75ohm BNC cable.
4. Set the Analyzer / De-Embedder to display the status of the audio data, and to receive a signal through the connected input.
5. Check that the Analyzer / De-Embedder does not report any data errors, etc.
6. Repeat 3 through 5 for menu selections:
 - < SDI 1 Pattern Right = Audio 02 > on SDI1 Pattern video output.
 - < SDI 1 Pattern Left / Right = Audio 03....16 > on SDI1 Pattern video output.
 - < SDI 1 Black Left / Right = Audio 01....16 > on SDI1 Black output.

AES / EBU Audio Outputs

Audio channels on the AES outputs are arranged as stereo pairs on each output:

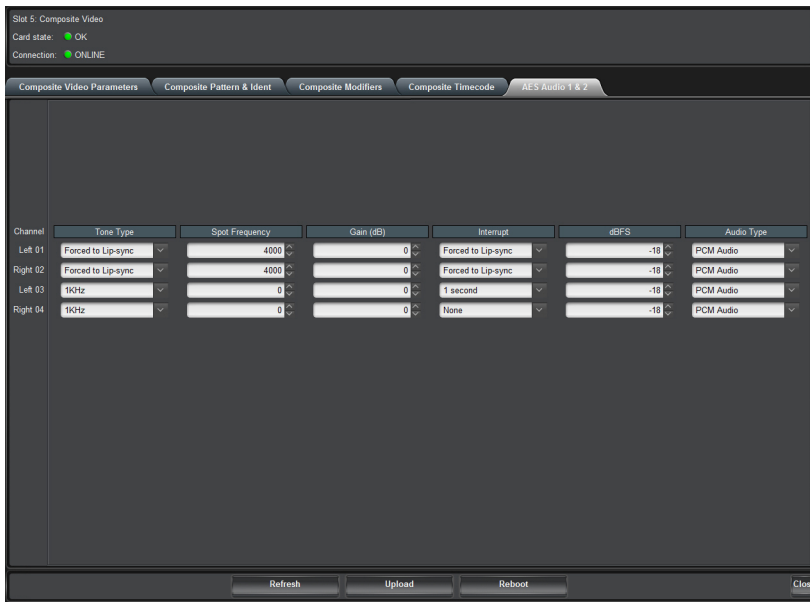
- AES 1 01 02
- AES 2 01 02

To verify the AES/EBU Audio Outputs

1. Double-click the **Slot 5: Composite Video** node.

The **Composite Video** interface displays in the DashBoard window.

2. Select the **AES Audio 1 & 2** tab.



3. Connect AES 1 BNC output to your Digital Audio Analyzer input.
4. Set the Digital Audio Analyzer to display the status of the audio data, and to receive a signal through the connected input.
5. Check that the Analyzer does not report any data errors, etc.
6. Check that the Digital Audio signal is as configured in the menu, and that selecting and editing entries in DashBoard, the configuration of the Digital Audio signal changes accordingly.
7. Repeat 3 through 6 for menu selection < Audio AES1 Right = Audio 02 > and AES Audio Channel 02.

Time and Timecode Settings

Each video output has its own dedicated Timecode generator, which can be offset from the main SPG Time. Additionally, there is a dedicated LTC output which can be similarly offset. There are also several Timecode system-related setup screens. This procedure will acquaint the user with the available options. Refer to **Figure 2.5** for a functional diagram of the Timecode system.

The following Time and Timecode values can be configured and monitored:

- SDI 1 & SDI 1 Black Timecode
- Composite VITC
- Tri-Sync Black 2 VITC
- Tri-Sync Black 3 VITC
- Tri-Sync Black 4 VITC
- LTC 1 Timecode
- SPG Time
- UTC DateTime
- NTP DateTime (UTC)
- Analog REF VITC (UTC)
- Summer DST Event (UTC) Winter DST Event (UTC) Leap Second Event (UTC)

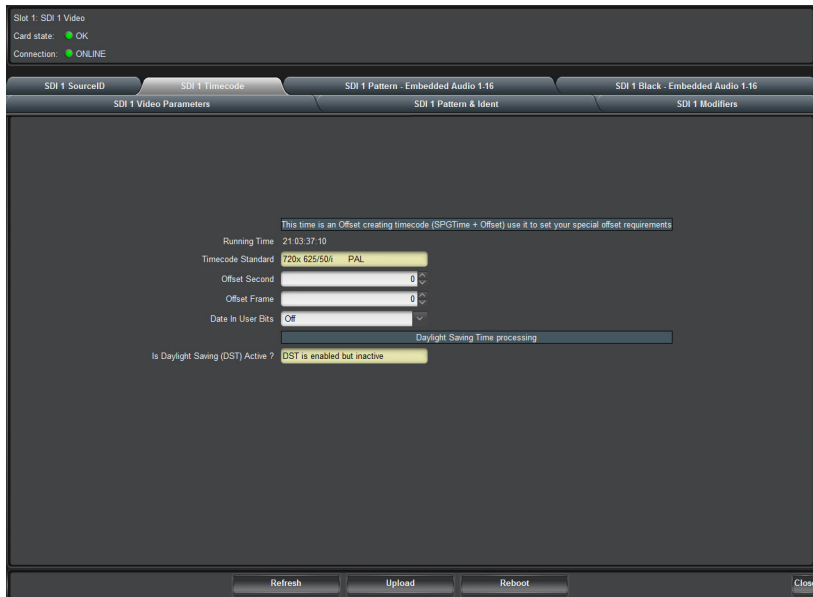
Full details regarding the setting of UTC Time, SPG Time, Summer & Winter DST Events, and Leap seconds can be found in section “**Slot 12: System Time Tabs**” on page 47. A flow chart outlining the Time and Date Configuration sequence is shown in **Figure 6.2** in the same section.

To verify the timecode settings

1. Double-click the **Slot 1: SD 1 Video** node.

The **SD 1 Video** interface displays in the DashBoard window.

2. Select the **SDI 1 Timecode** tab.



3. Repeat for < Composite 1 VITC > by opening **Slot 5: Composite Video**.

4. Repeat < Black 2 VITC >.

Notes on the Timecode

- Video Timecodes count at the frame-rate defined by the video format of the selected video channel.
- LTC Timecodes count at the frame-rate defined by the format selected in the menu.
- SPGTime and UTC DateTime are both “FIXED”, counting at 50Hz.
- Summer DST Event, Winter DST Event and Leap Second Event do not count.
- The system has a capacitive backed real-time-clock. This runs independently of any other reference. It can maintain reasonably accurate time over a few days while the unit is powered down. It is NOT to be trusted as reliable where your application requires accurate time. As the NTP Client option is so cost effective, we recommend its use in all vehicle installations where time is required to be locked to a remote time server.

Genlock Mode

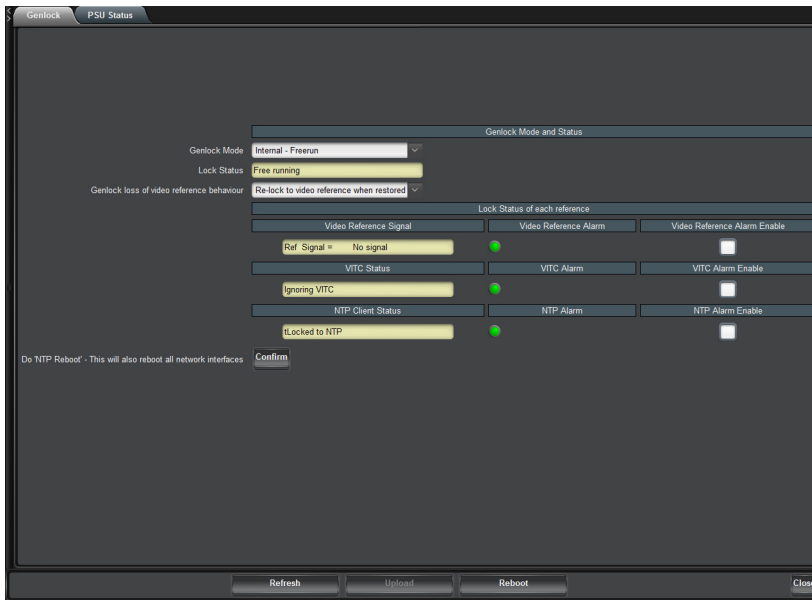
The Genlock tab allows the user to select the required Genlock mode of the SRG-2200.

To verify the Genlock settings

1. Double-click the **Slot 0: SRG-2200** node.

The **SRG-2200** interface displays in the DashBoard window.

2. Select the **Genlock** tab.



3. From the **Genlock Mode** menu, select **Internal Freerun**.
4. Check that < -Lock Status > confirms the instrument is using the internal reference.
5. Check that < -Ref Status > confirms the instrument has not detected an external reference.
6. Using a 75ohm BNC cable, connect Color Black from the TV signal generator to the SRG-2200 REF-LOOP input BNC connector. Terminate the unused REF-LOOP connector with a 75ohm termination.
7. Check that < -Lock Status > confirms the instrument is locked. If a valid signal has been connected, < -Lock Status > will usually sequence through the states:
 - Internal Lock
 - Locking
 - Locked
8. Check that < -Ref Status > confirms the instrument has detected an external reference by indicating the format of the signal you have connected to the REF- LOOP input.
9. Select < Lock Mode >.
10. From the **Genlock Mode** menu, select **Genlock to Video**.
11. Check that < -Lock Status > confirms the instrument is locked to the external reference.
12. Once you have selected < Genlock to Video > the SPG will Genlock the video outputs to the external reference if it is a valid signal. This can be confirmed on an oscilloscope or a vector-scope.
13. Disconnect the external reference from the REF-LOOP connector.

The < -Lock Status > should now indicate Internal Lock, and < -Ref Status > should now indicate No signal.

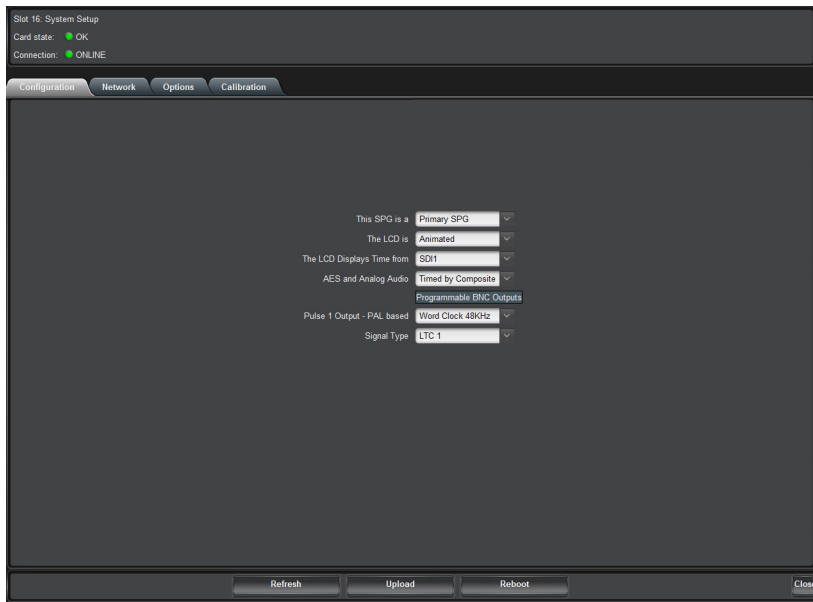
System Configuration

You can monitor and change SRG-2200 configuration and output personality settings from the System Setup tabs.

To change the SRG-2200 personality settings

1. Double-click the **Slot 16: System Setup** node.

The **System Setup** interface displays in the Dashboard window.
2. Select the **Configuration** tab.



Network Settings

The Network menu can be reached via the **Slot16: System Setup** tabs.

This is where the IP Address and Subnet Mask of the SRG-2200 can be set and monitored in conjunction with the **SW1** and **SW2** DIP Switches (on the rear panel).

Many of the parameters that can be configured in this menu require the user to obtain details from a Network Administrator. Once configured, they are unlikely to change.

Option Enable Settings

The Option Enable menu can be reached via the **Slot16: System Setup** tabs.

These tabs list the installed Option Keys for enabled options within the SRG-2200.

Changes to this menu are extremely unlikely to occur, and so no formal description will be outlined here. For the purposes of this functional check, simply scroll through the menu to check for any corrupted entry. Refer to the section “**Slot 16: System Setup Tabs**” on page 51 for details of the various options.

Calibration Settings

The Calibration menu can be reached via the **Slot16: System Setup**. These tabs list the system calibration values for the SRG-2200.

Changes to Calibration Settings should not be made under normal operation. These values are set during Factory Test and should only be altered under factory supervision. Refer to the section “**Slot 16: System Setup Tabs**” on page 51 for details of the various options.

Operational Configuration

There are several configuration factors that will influence the initial installation of your SRG-2200, namely:

- Mains Power
- DC Power
- Time, Date, DST etc.
- Video and Audio outputs
- References (Genlock, NTP, etc.)
- Network
- Connection to ACO-2200 Changeover unit

The user should refer to the various sections of this manual that explain each of these features, so that they may correctly configure the SRG-2200 to their requirements.

DashBoard Menus

The SRG-2200 provides the user with a comprehensive DashBoard interface to control the functions and options of the instrument.

SRG-2200 Status and Genlock Tabs

Select the Slot 0: SRG-2200 node to view the general status and installed system files of the SRG-2200. Also configure the Genlock Mode of the instrument and view its Genlock status.

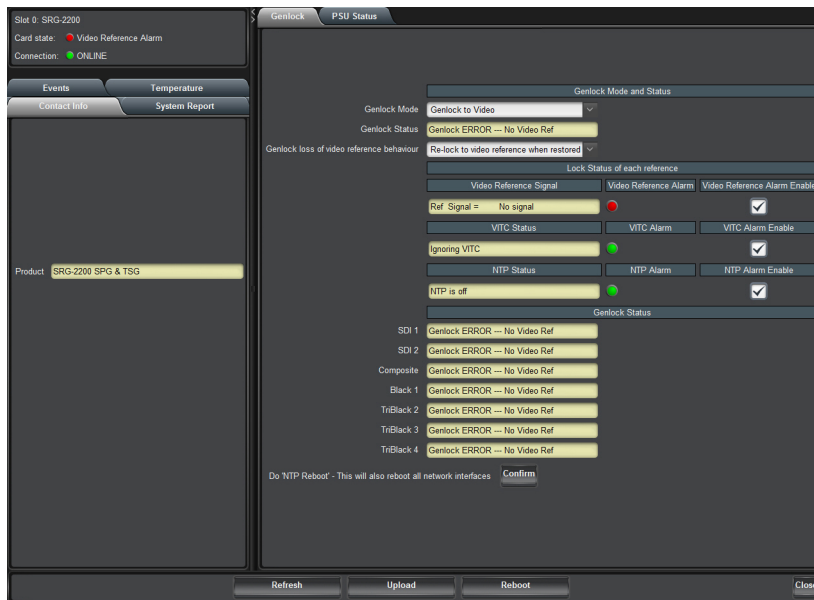


Figure 6.1 Example of the Slot 0: SRG-2200 Status and Genlock Tabs

Status Tabs

Four tabs display in the far left-side of the Slot 0: SRG-2200 node that report read-only information: Contact Info, System Report, Events, and Temperature.

★ Status tabs contain information only; there are no editable fields in these tabs.

System Report Tab

The System Report tab reports on the version information for the hardware, firmware and software elements that make up the SRG-2200.

Events Tab

The Event tab provides access to the last 99 events recorded by the SRG-2200. These events may relate to normal expected functionality or to systemic errors. This information might be useful in monitoring and diagnosing a system problem outside the SRG-2200, or a reliability problem within the SRG-2200.

A large number of different events can be recorded.

Table 6.1 Applicable Events

Event	Code	Event	Code
EventDefault	0	EventNewMaxTempAlarm1	27
Event Power On	1	EventNewMaxTempAlarm2	28
EventWatchdogReturn	2	EventNewMaxTempAlarm3	29
EventLVDReturn	3	EventNewMaxTempAlarm4	30
EventPowerOff	4	EventNewMaxTempAlarm5	31
EventLVDEvent	5	EventNewMaxTempAlarm6	32
EventnSetUTCTimeFromGPS	6	EventNewMaxTempAlarm7	33
EventGPSTimeLost	7	EventNewMinTemp0	34
EventSetUTCTimeFromNTP	8	EventNewMinTemp1	35
EventNTPTimeLost	9	EventNewMinTemp2	36
EventLeftPSUfail	10	EventNewMinTemp3	37
EventLeftPSUreturn	11	EventNewMinTemp4	38
EventRightPSUfail	12	EventNewMinTemp5	39
EventRightPSUreturn	13	EventNewMinTemp6	40
EventPSULCDCancelManual	14	EventNewMinTemp7	41
EventPSULCDCancelAuto	15	EventNewMinTempAlarm0	42
EventPSULCDRepeatManual	16	EventNewMinTempAlarm1	43
EventPSULCDRepeatAuto	17	EventNewMinTempAlarm2	44
EventNewMaxTemp0	18	EventNewMinTempAlarm3	45
EventNewMaxTemp1	19	EventNewMinTempAlarm4	46
EventNewMaxTemp2	20	EventNewMinTempAlarm5	47
EventNewMaxTemp3	21	EventNewMinTempAlarm6	48
EventNewMaxTemp4	22	EventNewMinTempAlarm7	49
EventNewMaxTemp5	23	EventEthernetLinkMade	50
EventNewMaxTemp6	24	EventEthernetLinkLost	51
EventNewMaxTemp7	25	EventGPSSetTimecodeFromGPSFlag	52
EventNewMaxTempAlarm0	26	EventGPSUnSetTimecodeFromGPSFlag	53

Temperature Tab

The Temperature tab provides information on the temperature sensors within the SRG-2200. A typical example might look like: +3v3 Regulator 42 45 41

Depending on the exact configuration and options in the SRG-2200, only those sensors that are detected will be displayed. If a sensor is installed but has failed, the description in the relevant line appears as: Fixed PSU-Sensor absent

Genlock Tab

The SRG-2200 has a very stable 10MHz internal oscillator. The SRG-2200 can free-run on this 10MHz reference and maintain long term stability.

Alternatively, the SRG-2200 can Genlock to an NTSC, or PAL B/G video reference. In this mode, the long term stability is defined by the external reference.

When locked to a Composite video signal, the lock will be frequency and phase related.

Genlocking to an External Video Reference

The SRG-2200 Genlock to an external video reference in the following manner. As soon as a video reference is applied, it is evaluated, usually within 2 seconds, and, if valid, the Genlock system performs an initial “quick-lock” to quickly achieve field and line lock. Then, a “slow-lock” is performed in order to achieve sub-carrier lock, and ultimately Sc-H lock. Both of these lock modes are designed to “glide” the SRG-2200 video output(s) smoothly towards the required lock point.

For situations where the reference and the SPG output are quite close to each other timing-wise, this Genlocking process may happen quite quickly, within a few seconds or so. At other times, especially when a PAL reference is four fields removed from the required lock point, the process to complete the full Genlock process may take as long as 15 seconds.

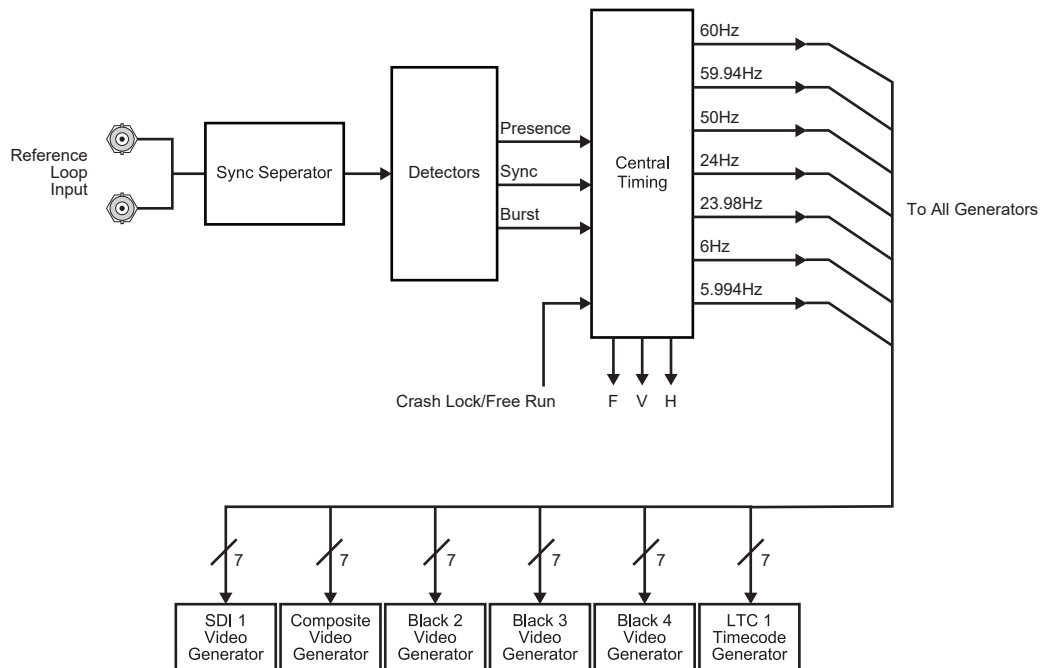


Figure 6.2 Genlock to External Video Reference

Video Reference Input Signal Formats

If an external Genlock reference is present, details regarding the format of the reference are displayed under the **Video Reference Format** of the **Genlock** tab.

The options in the field will appear as:

```
No signal
525 NTSC59.94i
625 PAL 50i
```

While the SRG-2200 is actively evaluating the external reference format, an additional option will appear in this field. This option appears as: “Unknown format”.

Genlock Mode

This tab allows the user to select the required Genlock mode of the SRG-2200. The options in the field are:

- Internal to Free-run
- Genlock to Video
- Genlock to Video + VITC

Genlock Loss of Video Reference

This menu allows the user to select the action the SRG-2200 will take if reference is lost.

PSU Status Tab

The PSU Status tab shows read only values for the number of times the power supply has been cycled, and the running hours count.

Slot 1: SDI Video and Embedded Audio Tab

Select **Slot1: SDI Video** to Set, Select and configure the SDI Video Pattern and Black outputs to suit your requirements. The following Tabs are available to allow configuration of format, pattern, Text Idents, Embedded Audio and more.

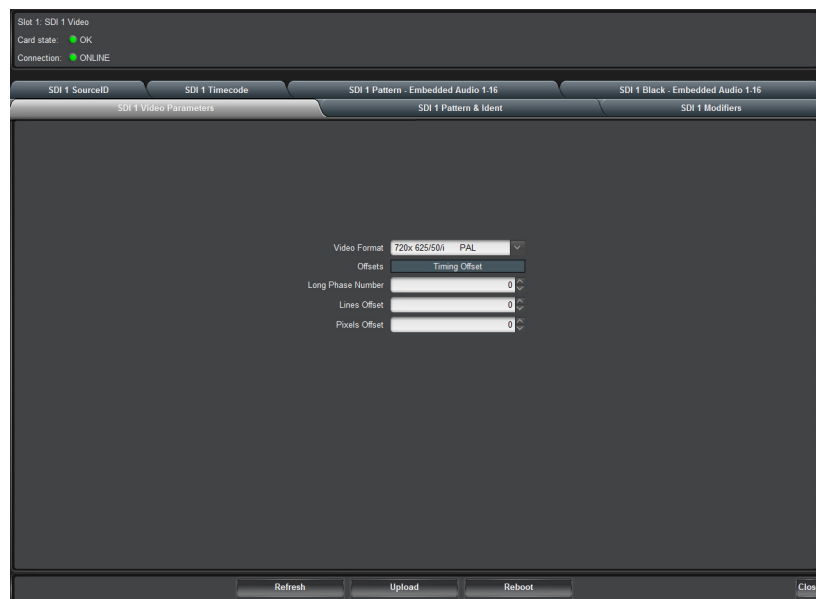


Figure 6.3 Example of the Slot 1: SDI Video and Embedded Audio Tabs

SDI 1 Video Parameters Tab

Use the **Video Format** menu to specify the format for the SDI 1 Input.

Table 6.2 SDI Video Parameters Tab — Video Format Menu

Available Video Formats	
720x 525/59.94/i NTSC-M	1920x1080/25/p
720x 625/50/i PAL	1920x1080/24/p
1280x720/60/p	1920x1080/23.98/p
1280x720/59.94/p	1920x1080/60/i

Table 6.2 SDI Video Parameters Tab — Video Format Menu

Available Video Formats	
1280x720/50/p	1920x1080/59.94/i
1280x720/30/p	1920x1080/50/i
1280x720/29.97/p	1920x1080/30/psf
1280x720/25/p	1920x1080/29.97/psf
1280x720/24/p	1920x1080/25/psf
1280x720/23.98/p	1920x1080/24/psf
1920x1035/60/i	1920x1080/23.98/psf
1920x1035/59.94/i	1920x1080/60/p
1920x1080/30/p	1920x1080/59.94/p
1920x1080/29.97/p	1920x1080/50/p

Timing Offset Options

- **Long Phase Number** — the timing offset is editable and is represented as a number (e.g. 0-2474999 where Standard = 28, and Description = 1920x1080/59.95/i; 0-726404095 where Standard = 05, and Description = 720x525/59.95/i NTSC-M). This large number will vary depending on the selected format.
- **Lines Offset** — Set an offset from 0 up to the total number of video lines in the selected format.
- **Pixels Offset** — Set an offset from 0 up to the total number of video pixels in each line of the selected format.

SDI 1 Pattern & Ident Tab

Table 6.3 SDI 1 Pattern & Ident Items

Item	Parameter	Notes
Video Format	#	Selects the video format for SDI 1/Black 1
Pattern	#	Selects the pattern for SDI 1 Pattern 1 output
Ident # Memory	#	Up to 3 lines of text that can be overlaid on the pattern output
Vertical Position	#	The vertical position of the on screen Ident text
Character Size	#	The size of the Ident text
Ident Vis Chars	#	Normally set to automatic, this allows the user to specify how many characters per Ident line are visible
Ident Vis Rows		This allows the user to select how many Ident lines are visible
Ident Edge	Not implemented at this time	
Ident Off/Opacity		Set the opacity of the Ident text, or turn it off
Ident Row Motion		Set the type of Ident text row motion
Ident Box Motion		Sets the type of Ident text box motion

SDI 1 Modifiers Tab

Table 6.4 SDI 1 Modifiers Items

Item	Parameter	Notes
Video Format		Set the SDI video format
Modifiers		
Pattern Bounce	Not implemented at this time	
Circle Type		Allows the user to set a circle overlay on the pattern to Off Static or animated
Circle Size	#	Set the size of the circle
Circle Aspect	#	This read-only field shows the current aspect ration the circle is set for
OSD Time and Date		Allows the user to turn on or off the on screen time and date display
OSD Warnings		If turned on, any warnings will be shown on the On Screen Display
Pattern Output Modifiers		
Pattern Output		Allows the user to select Pattern or Black for SDI 1
On Screen Menus	Not implemented at this time	
ATC		Allows the user to select the time code that will be inserted into the SDI pattern output
CRC		For SD SDI, allows the user to turn on and off the embedded CRC checksums
Black Output Modifiers		
Black Output		Allows the customer to select between Pattern and Black for the SDI 2 output
On Screen Menus	Not implemented at this time	
ATC		Allows the user to select the time code that will be inserted into the SDI 2 output
CRC		For SD SDI, allows the user to turn on and off the embedded CRC checksums

SDI 1 Source ID Tab

Table 6.5 SDI 1 Source ID Items

Item	Parameter	Notes
Type		Allows user to turn Off the embedded source id, or to enable the source ID in the Luma VANC
DID	#	Allows the user to set the DID and SDID for the source ID packets
SDID	#	
Insert on Line	#	Allows the user to select which line the Source ID packet will be on
Text		Allows the user to enter text to be carried in the source ID packet

SDI 1 Timecode Tab

Table 6.6 SDI 1 Timecode Items

Item	Parameter	Notes
Running Time	#	This is a DashBoard representation of the time code being inserted into SDI 1
Timecode Standard	#	This read-only field shows the current video format
Offset Second	#	Allows the user to add an offset (in seconds) to the timecode embedded in SDI 1
Offset Frame	#	Allows the user to add an offset (in frames) to the timecode embedded in SDI 1
Date in User Bits	#	Allows the user to turn off, turn on Date, or turn on Date including time zone. This will be in embedded in the timecode user bits
Daylight Saving Time Processing		
Is Daylight Savings (DST) Active?	#	This read-only field reports the current status of DST

SDI 1 Pattern - Embedded Audio 1-16 Tab

Table 6.7 SDI 1 Pattern - Embedded Audio 1-16 Items

Item	Parameter	Notes
HD Pattern Embedder	Off	
	Audio 1...4	
	Audio 1...8	
	Audio 1...12	
	Audio 1...16	
Embedded Tone	Silence	
	On	
Channel - #		

Table 6.7 SDI 1 Pattern - Embedded Audio 1-16 Items

Item	Parameter	Notes
Tone Type	400Hz	
	800Hz	
	1KHz	
	Sweep	Sweep ramps the frequency from 20Hz to 20KHz in 3 seconds
	Step	Step includes spot tones of: 400Hz, 4KHz, 9KHz, 14KHz, 800Hz, 5KHz, 10KHz, 15KHz, 1KHz, 6KHz, 11KHz, 16KHz, 2KHz, 7KHz, 12KHz, 3KHz, 8KHz, 13KHz
Tone Type	A-Maj Chord	Uses the first 8 channels and includes the frequencies (from the Equi- Tempered Scale): 329.628Hz = E, 440.000Hz = A, 554.276Hz = C#, 659.256Hz = E, 880.000Hz = A, 1108.552Hz = C#, 1318.512Hz = E, and 1760.000Hz = A
	A-Maj Scale	Similar to Step but uses only the notes from the C-Major chord (from the Harmonic Scale): 1056Hz = C, 1187Hz = D, 1319Hz = E, 1407Hz = F, 1584Hz = G, 1760Hz = A, 1979Hz = B, and 2112Hz = C
	Spot Frequency	
	Sample 1	
	Forced to Blitz	
	Forced to Lip-sync	
	Forced to Sample 1	
Spot Frequency	#	Allows the user to select any frequency between 20Hz and 20KHz (in 1Hz steps).
Gain (dB)	#	The options in the field are: Silence, -60dB to +18dB (in 1dB steps). The upper limit is actually set by the dBFS menu (detailed below).
Interrupt	Off	Glits can only be selected on odd (left) channels. Glits also uses the associated even (right) channel in the pair to create a stereo audio identification sequence. Blits can only be selected on channel 01. Blits also uses the next five channels to create a 5.1 Surround Sound Audio Identification sequence.
	1 second	
	3 seconds	
	Glits	
	Blits 5.1	
dBFS	Silence	
	-24 to -18dB	

Table 6.7 SDI 1 Pattern - Embedded Audio 1-16 Items

Item	Parameter	Notes
Audio Type	PCM Audio	
	PCM Silence	
	Dolby-E	
	Forced to PCM Silence	
	Forced to Sample 1	
	Not Embedded	

SDI 1 Black - Embedded Audio 1-16 Tab

The **SDI Black Embedded Audio** tab has the same options as SDI 1 Pattern - Embedded Audio 1-16 tab. The options in this tab are used to configure the SDI 2 output.

Slot 5: Composite Video Tabs

Select **Slot5: Composite Video** to Set, Select and configure the SD Analog Video to suit your requirements. The following Tabs are available to allow configuration of format, pattern, Text Idents, Embedded Audio and more.

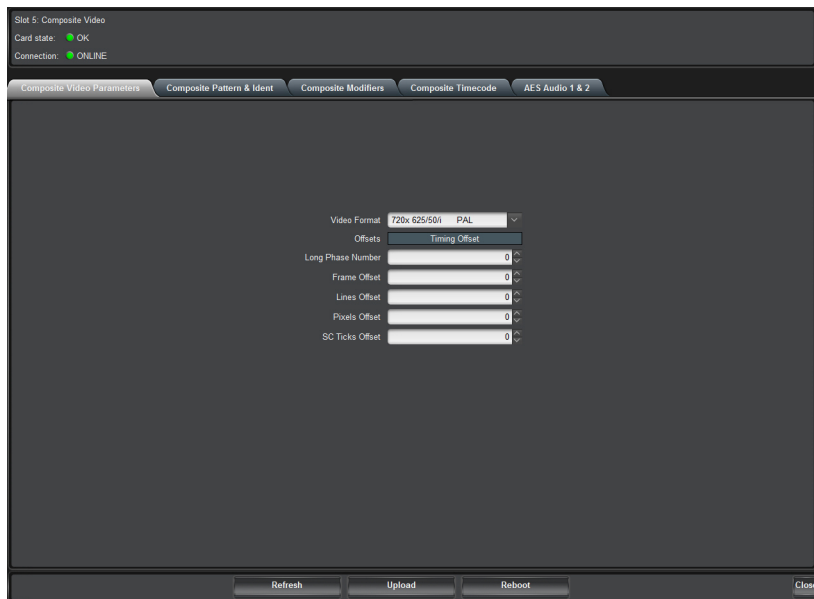


Figure 6.4 Example of Slot 5: Composite Video Tabs

Composite Video Parameters

Table 6.8 Composite Video Parameters

Item	Parameter	Notes
Video Format	#	Allows the user to select NTSC-M, NTSC-J or PAL
Timing Offset		
Long Phase Number	#	The timing offset is editable and is represented as a “large number”. For example: <ul style="list-style-type: none"> • 0-2474999 where Standard = 28 and Description = 1920x1080/59.95/i • 0-726404095 where Standard = 05 and Description = 720x525/59.95/i NTSC-M This “large number” will vary depending on the selected format.
Frame Offset	#	Allows the user to select the number of fields offset to apply to the composite output
Lines Offset	#	Line offset V=0000 where V=0 up to the total number of video lines in the selected format
Pixels Offset	#	Pixel offset P=0000 where P=0 up to the total number of video pixels in each line of the selected format
SC Ticks Offset	#	Sub-carrier offset where Sc=0 up to the total number of sub-pixels that equate to one cycle of sub-carrier in the selected format

Composite Pattern and Ident

Table 6.9 Composite Pattern and Ident Items

Item	Parameter	Notes
Video Format	#	Select the video format for Composite output
Pattern		
Pattern	#	Select the pattern for the composite output
Ident		
Iden # Memory	#	Up to 3 lines of text that can be overlaid on the pattern output
Vertical Position	#	The vertical position of the on screen Ident text
Character Size	#	The size of the Ident text
Iden Vis Chars	#	Normally set to automatic, this allows the user to specify how many characters per Ident line are visible

Table 6.9 Composite Pattern and Ident Items

Item	Parameter	Notes
Ident Vis Rows	#	This allows the user to select how many Ident lines are visible
Ident Edge	Not implemented at this time	
Ident Off/Opacity	#	Set the opacity of the Ident text, or turn it off
Ident Row Motion		Set the type of Ident text row motion
Ident Box Motion		Sets the type of Ident text box motion

Composite Modifiers

Table 6.10 Composite Modifiers Items

Item	Parameter	Notes
Video Format	#	Set the composite output format
Modifiers		
Pattern Bounce	Not implemented at this time	
Circle Type		Allows the user to set a circle overlay on the pattern to Off Static or animated
Circle Size		Set the size of the circle
Circle Aspect		Allows the user to set the circle aspect ratio to 4:3 or 16:9
OSD Time and date		Allows the user to turn on or off the on screen time and date display
OSD Warnings		If turned on, any warnings will be shown on the On Screen Display
Composite Output Modifiers		
On Screen Menus	Off	
	On	
VITC Line	#	
F1 / L10	Off	
	On	
SMPTE 318M	Off	
	On	

Composite Timecode

Table 6.11 Composite Timecode Items

Item	Parameter	Notes
Running Time	#	This is a DashBoard representation of the time code being inserted into the composite output
Timecode Standard		This read only field shows the current video format
Offset Second	#	Allows the user to add an offset (in seconds) to the timecode embedded in the composite output
Offset frame	#	Allows the user to add an offset (in frames) to the timecode embedded in the composite output
Date in User Bits	Off	Allows the user to turn off, turn on Date, or turn on Date including time zone. This will be in embedded in the timecode user bits
	Date as BCD	
	Date as BCD (including timezone)	
Daylight Saving Time Processing		
Is Daylight Savings (DST Active?)		Read-only field to show current status of DST

AES Audio 1 and 2

Table 6.12 AES Audio 1 and 2 Items

Item	Parameter	Notes
Channel - #		
Tone Type	400Hz	
	800Hz	
	1KHz	
	Sweep	Sweep ramps the frequency from 20Hz to 20KHz in 3 seconds
	Step	Step includes spot tones of: 400Hz, 4KHz, 9KHz, 14KHz, 800Hz, 5KHz, 10KHz, 15KHz, 1KHz, 6KHz, 11KHz, 16KHz, 2KHz, 7KHz, 12KHz, 3KHz, 8KHz, 13KHz
	A-Maj Chord	Uses the first 8 channels and includes the frequencies (from the Equi- Tempered Scale): 329.628Hz = E, 440.000Hz = A, 554.276Hz = C#, 659.256Hz = E, 880.000Hz = A, 1108.552Hz = C#, 1318.512Hz = E, and 1760.000Hz = A
	A-Maj Scale	Similar to Step but uses only the notes from the C-Major chord (from the Harmonic Scale): 1056Hz = C, 1187Hz = D, 1319Hz = E, 1407Hz = F, 1584Hz = G, 1760Hz = A, 1979Hz = B, and 2112Hz = C
	Spot Frequency	
Sample 1		

Table 6.12 AES Audio 1 and 2 Items

Item	Parameter	Notes
Tone Type	Forced to Blitz	
	Forced to Lip-sync	
	Forced to Sample 1	
Spot Frequency	#	Allows the user to select any frequency between 20Hz and 20KHz (in 1Hz steps).
Gain (dB)	#	The options in the field are: Silence, -60dB to +18dB (in 1dB steps). The upper limit is actually set by the dBFS menu (detailed below).
Interrupt	Off	Glits can only be selected on odd (left) channels. Glits also uses the associated even (right) channel in the pair to create a stereo audio identification sequence.
	1 second	
	3 seconds	
	Glits	Blits can only be selected on channel 01. Blits also uses the next five channels to create a 5.1 Surround Sound Audio Identification sequence.
	Blits	
dBFS	Silence	
	-24 to -18dB	
Audio Type	PCM Audio	
	PCM Silence	
	Dolby-E	
	Forced to PCM Silence	
	Forced to Sample 1	
	Not Embedded	

Slots 8, 9, 10: Color Black and Tri-Level Sync Tabs

Select **Slots 8,9,10: Color Black** Set, Select and configure the format and other parameters of the analog reference outputs to suit your requirements. The following Tabs are available to allow comprehensive configuration of format, modifiers, Timecode, and signal Timing Offsets.

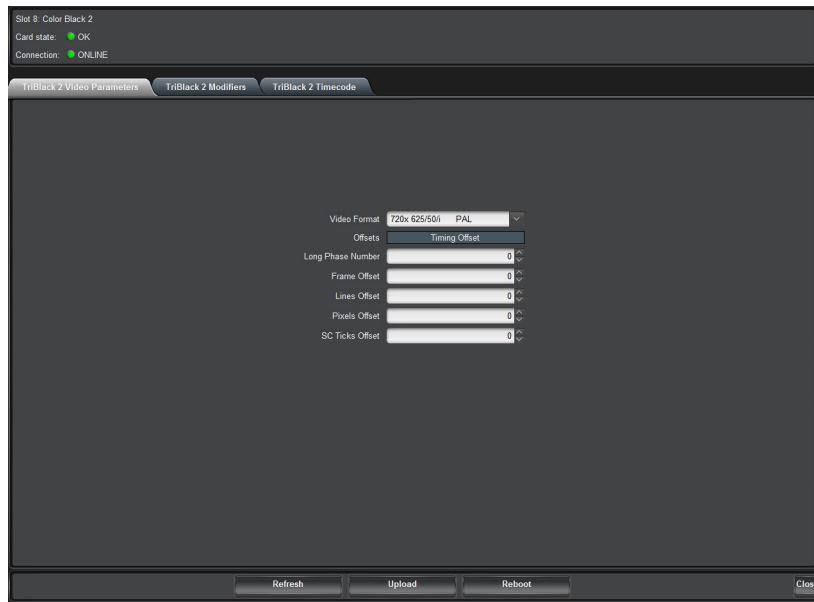


Figure 6.5 Example of Slot 8: Color Black Tabs

TriBlack Video Parameters Tab

Table 6.13 TriBlack Video Parameters Items

Item	Parameter	Notes
Video Format		Allows the user to select the signal to be output on the Tri/Black BNC
Long Phase Number	#	The timing offset is editable and is represented as a “large number”. For example: <ul style="list-style-type: none"> • 0-2474999 where Standard = 28, and Description = 1920x1080/59.95/i • 0-726404095 where Standard = 05, and Description = 720x525/59.95/i NTSC-M This “large number” will vary depending on the selected format
Frame Offset	#	Allows the user to select the number of frames offset to apply to the output
Lines Offset	#	Specifies the Line offset where the range of values is 0 up to the total number of video lines in the selected format
Pixels Offset	#	Specifies the pixel offset where the range of values is 0 up to the total number of video pixels in each line of the selected format
SC Ticks Offset	#	The number of ticks in once cycle of sub-carrier of the current video format. The range of values is 0 up to the total number of sub-pixels that equate to one cycle of sub-carrier in the selected format.

TriBlack Modifiers Tab

Table 6.14 TriBlack Modifiers Items

Item	Parameter	Notes
Video Format		Allows the user to select the signal to be output on the Tri/Black BNC
VITC Line	#	If the video format supports VITC, this is the line the SRG-2200 will insert it on
F1/L10	Off	For NTSC and PAL formats, adds a white bar to the Field 1 line 10
	On	
SMPTE 318M	Off	For NTSC formats, inserts the 10 field identification signal on lines 15 and 278
	On	

TriBlack Timecode Tab

Table 6.15 TriBlack Timecode Items

Item	Parameter	Notes
Running Time	#	This is a DashBoard representation of the time code being inserted into the Tri/Black output
Timecode Standard	#	This read only field shows the current video format
Offset Second	#	Allows the user to add an offset (in seconds) to the timecode embedded in the Tri/Black output
Offset frame	#	Allows the user to add an offset (in frames) to the timecode embedded in the Tri/Black output
Date in User Bits	Off	Allows the user to turn off, turn on Date, or turn on Date including time zone. This will be in embedded in the timecode user bits.
	Date as BCD	
	Date as BCD (including timezone)	
Is Daylight Savings (DST Active?)		Read-only field to show current status of DST

Slot 12: System Time Tabs

Select **Slot12: System Time** to configure and view all possible time outputs from the SRG-2200 to suit your location and application. The following tabs are available to allow comprehensive configuration and monitoring.

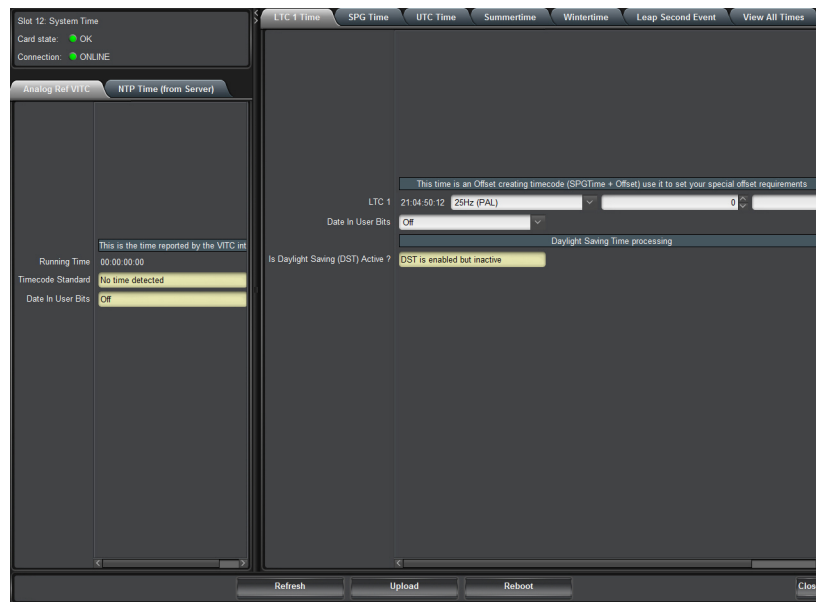


Figure 6.6 Example of Slot 12: System Time Tabs

Analog Ref VITC Tab

This status tab displays the following read-only fields:

- **Running Time** — If the reference signal has VITC, this is the Dashboard representation of the reference timecode.
- **Timecode Standard** — This is the format of the reference.
- **Date in User Bits** — reports the how Date in User Bits is in embedded.

NTP Time (from Server) Tab

This status tab displays the following read-only fields:

- **NTP Time** — If the optional NTP client is enabled, this is the DashBoard representation of the current NTP time.
- **Weekday** — The day of the week as reported by the NTP client.
- **Date** — The day of the month as reported by the NTP client.
- **Month** — The month as reported by the NTP client.
- **Year** — The year as reported by the NTP client.

LTC 1 Time Tab

Table 6.16 LTC 1 Time Items

Item	Parameter	Notes
LTC 1 (DST)		This is a DashBoard representation of the time code being output on the LTC 1 connector
Timecode Standard	#	This allows the user to configure the LTC output for various frame rates
Offset Second	#	Allows the user to add an offset (in seconds) to the timecode embedded in the LTC 1 output
Offset frame	#	Allows the user to add an offset (in frames) to the timecode embedded in the LTC 1 output
Date in User Bits	Off	Allows the user to turn off, turn on Date, or turn on Date including time zone. This will be in embedded in the timecode user bits.
	Date as BCD (ST309)	
	Date as BCD (ST309 including timezone)	
	Date as BCD (ITU/Leitch/BBC)	
Is Daylight Savings (DST Active?)		Read-only field to show current status of DST

SPG Time Tab

Table 6.17 SPG Time Items

Item	Parameter	Notes
SPG	#	Time is the datum from which all Video and LTC timecodes are offset
Timezone Offset Hour	#	Users can enter their timezone offset in hours from UTC
Timezone Offset Minutes	#	Users can enter their timezone offset in 15 minutes steps
Weekday	#	Read only field to show the day of the week
Date	#	Read only field to show the day of the month
Month	#	Read only field to show the month of the year
Year	#	Read only field to show the current year
Is Daylight Savings (DST Active?)		Read-only field to show current status of DST

UTC Time Tab

The UTC Time tab allows the user to manually adjust UTC Time (where the SPG is not synchronized to an external time source, such as NTP or VITC).

The **UTC Time** field “00:00:00:00” is used to add / subtract time in the **UTC DateTime** menu. The sub- fields in the field “00:00:00:00” represent hours : minutes : seconds : frames. When sub- fields are adjusted, the corresponding fields in **Running Time** reflect the changes.

Each sub-field (except the **Frame** field) is edited individually. A highlight cursor is displayed showing which sub-field is active and hence editable in the field.

The **UTC Time** field counts continuously. Note that each time the seconds field is nudged, the frames field is reset to zero. This provides an easy way to set the UTC time to be coincident with your temporary reference.

This field always displays zeros in each of the sub-fields.

When VITC or NTP are enabled, the Nudge feature is disabled.

Daylight Saving Time Processing

Set the Auto Daylight Saving mode to one of the following:

- **Auto DST Enabled (Automatic)** — make sure to select the correct country code and state code to have the unit automatically make the time change.
- **Auto DST Enabled (user defined)** — allows custom selection time changes. The summer time and winter time tabs will allow the setting of day, month, year, hour, minute, second, frame for the change to occur. You must click **Refresh** after opening the Summer or Winter tabs.
- **Auto DST off** — there will be no automatic seasonal time change.
- **Auto DST Enabled (Automatic)** — make sure to select the correct country code and state code to have the unit automatically make the time change.
- **Auto DST Enabled (user defined)** — allows custom selection time changes. The summer time and winter time tabs will allow the setting of day, month, year, hour, minute, second, frame for the change to occur. You must click **Refresh** after opening the Summer or Winter tabs.
- **Auto DST off** — there will be no automatic seasonal time change.

Use the **Country Code** and **State Code** menus to specify to the SRG-2200 which country and state/province it is located in. The unit can then automatically set the start and end dates for Daylight savings Time

Summertime Tab

If the user wishes to manually set the start of DST, this tab allows them to configure the hour, minute, second, frame, date, month, and year to start DST.

Wintertime Tab

If the user wishes to manually set the end of DST, this tab allows them to configure the hour, minute, second, frame, date, month, and year to end DST.

Leap Second Event Tab

The options in the **Leap Second Processing** menu are: Off (manual), User Defined.

If you select User Defined, then the time and date will automatically adjust at the time and date set in the **Leap Second Event (UTC)** menu.

View All Times Tab

This tab allows the user to see all the times being generated by the SRG-2200. Adjustments can be made per the above descriptions.

Slot 16: System Setup Tabs

Select Slot16: System Setup provides access to view Factory Calibration Settings and if necessary restore or repair any settings which may have changed for any reason. It also provides details of installed options and their relevant Option Enable Key.



Warning — *Do not attempt to change these without factory guidance or assistance.*

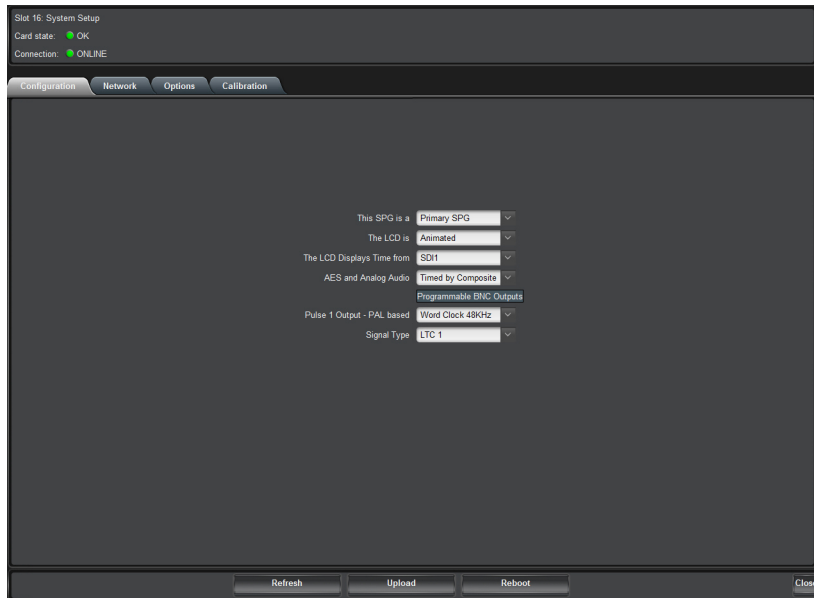


Figure 6.7 Example of Slot 16: System Setup Tabs

Configuration Tab

The Configuration tab provides access to a range of features that determine the functionality of the SRG-2200 not otherwise covered by other menu settings. These options are typically set up during the system commissioning of the SRG-2200, and thereafter are unlikely to be changed.

Table 6.18 Configuration Items

Item	Parameter	Notes
This SPG is a	Primary SPG	The SRG-2200 can be installed with a partner SRG-2200 and an ACO-2200. In this configuration, one of the SRG-2200 is defined as PRIMARY and the other as BACKUP. This menu row item allows the selection of PRIMARY or BACKUP. The polarity of the ONAIR tally is also controlled by this selection.
	Backup SPG	
The LCD is ^a	Static	No cycling through the different information
	Animated	Display cycles through different information

Table 6.18 Configuration Items

Item	Parameter	Notes
LCD Displays Time from ^b	SDI 1	<p>This menu allows the user to choose which time within the SRG-2200 is displayed on the LCD.</p> <ul style="list-style-type: none"> • If the Time is SPG Time, the digits are separated by “. . .” (e.g. 09.34.05.10). Note that SPG time does not include DST changes. • If the selected time is drop frame, the digits are separated by “; ; ;” (e.g. 09;34;05.10). • If the selected time is not drop frame, the digits are separated by “: : :” (e.g. 09:34:05:10).
	Composite	
	Black2-4	
	LTC1	
	SPG Time	
AES and Analog Audio	Timed by SDI1	<p>This menu item allows the user to select the appropriate video from which the AES and Analog Audio are referenced.</p>
	Copy of SDI1	
	Timed by Composite	
Pulse 1 Output ^c - NTSC Based	#	<p>This menu selects the signal type for the Word Clock BNC connector. The user can configure the Word Clock BNC to output signals other than word Clock, such as LTC, 2.048MHz, LTC, etc.</p>
Signal Type	#	<p>This menu selects the signal type for the LTC BNC connector. The user can configure the LTC BNC to output signals other than LTC, such as Word Clock, 2.048MHz, LTC, etc.</p>

- This menu allows the user to select the animation mode on the LCD. When the Timecode screen is selected, the display will be either static, or will cycle alternately with the time, fault conditions, and IP Address.
- LTC1, Black2-4 and SDI1 include DST when it is active.
- Options 1 through 7 produce pulses determined by the format of the CVBS output.

Network Tab

The Network tab, and the associated sub-tabs, allows the user to configure and control the behavior of the Ethernet system within the SRG-2200.

Before proceeding, the user must contact their Network Administrator, and obtain suitable IP addresses, etc., that will need to be programmed within this menu.

Ethernet Tab

Displays the Network settings including the SRG-2200 IP address.

- **IP address of this SPG** — This field allows the user to enter the IP address of the SRG-2200. The options in the sub-fields “000” are: 000 through 255 where “000” is the default “no action” setting.
- **IP Sub Net Mask** — This field allows the user to enter the SubNet Mask address of the SRG-2200. The options in the sub-fields are: 000 through 255. where “000” is the default “no action” setting.
- **IP Gateway Address** — This field allows the user to enter the Gateway address of the SRG-2200. Typically, this might be the IP address of a network hub to which the SRG-2200 is connected. The options in the sub-fields are: 000 through 255 where “000” is the default “no action” setting.
- **MAC Address** — This field displays the MAC Address (Media Access Control), a unique, read-only identifier assigned to network interfaces for communications on the physical network segment. This field cannot be changed - the MAC address is stored in a hardware device and is unique to each SRG-2200, and is also used to provide unique update keys when enabling options within the unit.

This is the Primary/Backup SRG Tab

This tab appears if the SRG-2200 is set as the Primary unit in a Changeover pair. It informs the user that the SRG-2200 is the Primary unit of a Changeover pair, and consequently, polling (of the remote device) is disabled.

When the SRG-2200 is set as the Backup unit in a Changeover pair, this menu line appears as one of the following:

- `“-Completed Polls = nnn”` — Where the field “`nnn`” will increment in conjunction with the number of successful polls of the Primary unit.
- `“-Completed Polls = nnn”` — Where the field “`= nnn`” is blank if the previous line regarding the Polling Interval is set for “Never”.

When the SRG-2200 is set as a Backup, this tab allows the user to define the Primary SRG-2200 IP Address and Subnet Mask, set the number of seconds between polls of the primary SRG-2200, and shows the number of completed polls of the Primary SRG-2200. It also shows the current Poll Status.

NTP/PTP Tab

Access to the NTP menu is only possible if the NTP option is enabled.

This menu line allows the user to control whether the SRG-2200 is configured to be an NTP Client or whether the NTP System is off.

- **Find Server on** — This menu line allows the user to define the IP address of a remote web-based NTP Server from which the SRG-2200 will periodically request time information. The address can be changed to one preferred by the user. The options in the sub-fields are: 000 through 255. The value of 000 is the default “no action” setting.
- **Poll Server** — This menu line allows the user to set the interval (in seconds) at which the SRG-2200 requests NTP time information from the specified time server. One initial power-up, the SRG-2200 will poll the NTP Server every 10 seconds until a reply is received, and then drop back to the user-selected value as programmed in this menu sub-field.
- **Poll Status** — This menu line reports the current poll status of the designated NTP Server address. Initially, the sub field will report that the SRG-2200 is currently waiting for replies from the designated NTP Server: `Poll Status = Acquiring NTP`.

When replies from the designated NTP Server produce consistently accurate time stamps, the sub-field will change to: `Poll Status = tLocked to NTP`.

During NTP acquisition, the following menu line appears below the Poll Status line: `Unlocked Poll every 010 secs`.

This menu line reports the polling interval when the NTP Server is being actively polled during initial acquisition. The interval of 10 seconds should ensure that at least one reply will be found very quickly. After a reply has been received, the polling interval drops back to the user setting made in the menu entry `Poll Server every 240 secs` above, and the following menu line appears.

The menu line `NTP time Uncertainty = nnnnms` reports the average variation in successive NTP replies.

PTP Mode

PTP is currently not supported on the SRG-2200.

SNMP Tab

SNMP is currently not supported on the SRG-2200.

Options Tab

The Options tab allows the user to enable options designed into the SRG-2200. Authorized users enter Option Update Keys, supplied only after consultation with Ross Video.

- ★ Option Update Keys are in the form of a 12-character string. Each key is completely unique to a specified option in a particular SRG-2200. Keys will not work for other options on the same SRG-2200, nor on any other SRG-2200. Remember to store these keys in a safe place - you may need to re-enter them if a system error necessitates a system re-configuration.

Encryption Key

Every time the SRG-2200 is powered on, this entry displays a pseudo-randomly generated 13-character key. This menu item cannot be changed by the user. This key is unique to each SRG-2200 and should be quoted when requesting any additional Option Enable Keys.

NTP

These menu lines will contain non-zero entries. These will be factory default values, and will be confirmed by the “.” between the character groups. For valid keys, the character groups will be separated by “-”.

Calibration Tab

- ★ The Calibration tab contains fundamental settings relating to the functionality and accuracy of the SRG-2200. These settings are programmed during initial testing, configuration and alignment. Under normal circumstances, it should not be necessary to adjust any of these settings after the unit has been installed. It is a good idea to make a manual record of these settings in case they become corrupted or are inadvertently changed. A convenient way to achieve this is to print this page, record the stored values alongside the respective menu lines, then store the list in a safe place.

Enable Calibration Changes

This feature enables the user to change any of the calibration settings in the remainder of this menu. This menu option is always unselected (box is cleared) upon entry - it requires a conscious action on the part of the user to select the box and thereby enable calibration value adjustments. The options are:

- Cleared — Calibration is disabled (Default). The user may view the menu values at any time.
- Selected — Calibration is enabled. The user is able to change any of the preset values.

Oven Frequency

This field allows the user to adjust the frequency of the internal 10MHz oscillator. When the SRG-2200 is configured for Internal Lock (refer to the section “**Genlock Tab**” on page 34), the video outputs on the SRG-2200 will “free run” compared to an external video signal from a known reference.

To set the 10MHz oscillator

1. View both the Composite output and the known reference on a vector scope.
2. On the vector scope, ensure that the known reference is also looped through to the EXT REF input, and that the EXT REF function is enabled.
3. Adjust the **Oven Frequency** menu setting so that the Composite video output signal rotates at less than 1 cycle/second compared to the known reference.

This setting varies from unit to unit.

Disclaimer

Most of these settings are determined during initial testing, configuration and alignment. They should not normally require adjustment or re-configuration during service. In some cases, specific test equipment or even custom apparatus is required to perform calibration and configuration.

On no account should the user attempt to alter any of these settings without proper authorization from Ross Video.

If problems are encountered, these settings can be re-instated. Contact Ross Video for further instructions.

Upgrading the Software

This upgrade procedure applies to SRG-2200 systems where an Ethernet connection is installed. It outlines the steps necessary to upgrade the software programmed on the main module.

Before You Begin

Before starting, ensure that you comply with the following requirements:

- Connect the SRG-2200 via an Ethernet cable to your local network;
- A PC, also connected via Ethernet to your local network, with the supplied update program(s) and associated data file(s) available. Data file(s) should be located in the same folder as the associated update program;
- A power-cycle could be required as part of a data file update. Ensure that the unit is not in service during the update process.

Table 7.1 lists the applicable files for your SRG-2200.

Table 7.1 SRG-2200 Files

File Type		Description
BootWare		At present, can only be uploaded at the factory.
Patfile	Pattern Files	Can be uploaded while the SRG-2200 is in operation. When complete, a power re-boot is required.
Xilfile	FPGA File	Requires that the SRG-2200 is in Bootloader mode. When complete, a power re-boot is required.
Software	SRG-2200 Software	Requires that the SRG-2200 is in Bootloader mode. When complete, a power re-boot is required.

To upload the Patfiles

1. Ensure that the SRG-2200 is powered on.
2. On your PC, run the **RossSystemUpdate_v#.#.#.#.exe** program.
3. Set the IP address and IP Mask to be the same as that of the SRG-2200 itself.
4. Select the **Get Mode** button. The status window should confirm the mode:
“The device is in APP_mode” displays in the LDC Display on the front panel.
5. If the SRG-2200 is “not found”, check again that all connections have been made, then try repeating the above procedure after powering the SRG-2200 off, and then resuming from the update program start-up line.
6. If the SRG-2200 still cannot be found, contact Ross Video for further assistance.
7. Select the **Open File** button.
8. Select the relevant *.ata file.
9. Select the **Send to device** button. Upload of file takes approximately 1 minute.
10. The status messages window should confirm that the upload was completed successfully. If not, select **Send to device** again.
11. Power cycle the SRG-2200.

To upload software files to a SRG-2200

1. On your PC, run the **RossSystemUpdate_v#.#.#.#.exe** program.
2. Set the IP address and IP Mask to be the same as that of the SRG-2200 itself.
3. Select the **Get Mode** button. The status window should confirm the mode:

After Get Mode, "The device is in Application_mode" displays in the window.

4. If the SRG-2200 is "not found", check again that all connections have been made, then try repeating the above procedure after powering down the SRG-2200, and then resuming from the update program start-up line.
5. If the SRG-2200 still cannot be found, contact Ross Video for further assistance.
6. Select the **Open File** button.
7. Select the relevant *.ata file.
8. Select the **Send to device** button. Upload of file takes approximately 1 minute.
9. The status messages window should confirm that the upload was completed successfully. If not, select **Send to device** again.
10. Power cycle the SRG-2200.

Your SRG-2200 is now upgraded and ready for use.

Troubleshooting

Generally speaking, the SRG-2200 is reliable under normal steady-state operating conditions. If you are having problems, select the symptom from the list in this chapter that closely relates to your particular problem, and perform the checks / actions listed.

Notice — Observe all cautions and warnings listed in the document “**Important Regulatory and Safety Notices to Service Personnel**” that accompanied your unit.

Troubleshooting Checklist

Table 8.1 provides troubleshooting guidance for the SRG-2200.

Table 8.1 Possible Symptoms and Solutions

Symptom(s)	Cause(s)	Action
LCD not operational Video/Audio outputs missing	<ul style="list-style-type: none">• DC Power missing• Power Supply fault• Bad power connection(s)	<ul style="list-style-type: none">• Check DC Power Block• Check DC and AC Lead integrity• Check AC supply fuse• Possible low volts
Intermittent Operation	Bad power connection(s)	Check power connections
Corrupted output(s)	Corrupted data	<ol style="list-style-type: none">1. Remove Power2. Wait 10 seconds3. Re-power the SRG-2200
NTP not operational	Option is not enabled	<ul style="list-style-type: none">• Ensure Option Key has been entered for applicable option• Contact Ross Video to obtain additional Option Key(s)

Rebooting the NTP Sub-system

The following tabs in DashBoard provide a button that can be used to reboot the sub-systems of the SRG-2200:

- **Slot 0: SRG-2200 > Genlock > Do NTP Reboot**
- **Slot 16: System Setup > Network > NTP > Do NTP Reboot**

Equipment Checklist

Routine maintenance to this Ross Video product is not required. In the event of problems with your SRG-2200, the following basic troubleshooting checklist may help identify the source of the problem. If the SRG-2200 still does not appear to be working properly after checking all possible causes, please contact your Ross Video 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** — Verify the power indicator LED 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.

Contacting Ross Video Technical Support

If your problem is not resolved after following these checks / actions, the fault is likely to be related to a mechanical or electrical component failure. Contact Ross Video for further assistance.

When you contact Ross Video regarding an issue on your SRG-2200, and so that we can process your inquiry efficiently, you should have available at least one of the following items of information in addition to your personal / company details (name, company, telephone, email):

- the frame serial number of the unit
- original delivery date

Specifications

This chapter lists the electrical, mechanical, and environmental characteristics, as well as the national and international standards to which the SRG-2200 complies.

★ Specifications are subject to change without notice.

General Characteristics

All listed specifications are guaranteed unless labeled with “Typical”. Typical specifications are provided for your convenience, but are not guaranteed.

Performance Conditions

The electrical characteristics listed on the following pages are valid under the following conditions:

- The SRG-2200 must be in an environment where the temperature, altitude, humidity, and vibration conditions are within the operating limits described in the section refer to the section “**Environment Characteristics**” on page 65.
- The SRG-2200 must have a warm-up period of at least 20 minutes.
- The SRG-2200 must have been calibrated and adjusted at an ambient temperature between +20°C and +30°C at an altitude of less than 2000m.
- The following label is used to indicated the altitude limitation.



Supported Formats

Supported Video Formats
Composite
720x 525/59.94/i NTSC J
720x 525/59.94/i NTSC M
720x 625/50/i PAL B/G
Tri-level/Black
SLOW PAL 720x 625/48/i
NTSC Sub-carrier 3.58MHz
PAL Sub-carrier 4.43MHz
720x 525/59.94/i NTSC-J
720x 525/59.94/i NTSC-M
720x 625/50/i PAL
1280x720/60/p
1280x720/59.94/p
1280x720/50/p
1280x720/30/p

Supported Video Formats
Tri-level/Black
1920x1080/60/p
1920x1080/59.94/p
1920x1080/50/p
SDI Formats
720x 525/59.94/i NTSC-M
720x 625/50/i PAL
1280x720/60/p
1280x720/59.94/p
1280x720/50/p
1280x720/30/p
1280x720/29.97/p
1280x720/25/p
1280x720/24/p
1280x720/23.98/p

Supported Video Formats
1280x720/29.97/p
1280x720/25/p
1280x720/24/p
1280x720/23.98/p
1920x1035/60/i
1920x1035/59.94/i
1920x1080/30/p
1920x1080/29.97/p
1920x1080/25/p
1920x1080/24/p
1920x1080/23.98/p
1920x1080/60/i
1920x1080/59.94/i
1920x1080/50/i
1920x1080/30/psf
1920x1080/29.97/psf
1920x1080/25/psf
1920x1080/24/psf
1920x1080/23.98/psf

Supported Video Formats
1920x1035/60/i
1920x1035/59.94/i
1920x1080/30/p
1920x1080/29.97/p
1920x1080/25/p
1920x1080/24/p
1920x1080/23.98/p
1920x1080/60/i
1920x1080/59.94/i
1920x1080/50/i
1920x1080/30/psf
1920x1080/29.97/psf
1920x1080/25/psf
1920x1080/24/psf
1920x1080/23.98/psf
1920x1080/60/p
1920x1080/59.94/p
1920x1080/50/p

Video Reference Inputs

Table 9.1 Video Reference Inputs

Category	Performance Requirement		Reference Information
Input Connector Type	2 x 75ohm BNC (loop through)		
Input Return Loss	>30dB to 10MHz		
Inputs	<ul style="list-style-type: none"> • NTSC Black Burst • PAL Black Burst 		
Input Requirements	Amplitude	-6dB to +6dB	
	S/N Ratio	>40dB	
	ScH Phase	±20°	
Pull-in Range	±50ppm		
Jitter	Burst	<0.5°	
	Sync	<1ns	
Genlock Time Offset Range	Range	Full color range	
	Resolution	<0.5 degree of sub-carrier	

Analog Video Outputs

Table 9.2 Analog Video Outputs

Category	Performance Requirement		Reference Information
Output Connector Type	75ohm BNC		
Number of Outputs	1 BNC — Composite Pattern Output		4 BNCs in total
	1 BNC — Tri-Black 2 Output		
	1 BNC — Tri-Black 3 Output		
	1 BNC — Tri-Black 4 Output		
Output Impedance	75ohm		
Return Loss	>30dB to 5MHz		
Formats	NTSC-M (with Setup) SMPTE-170M		See notes on field blanking
	NTSC-J (no Setup) SMPTE-170M		
	PAL CCIR-656 ITU-R BT 1700-1 (PAL-B)		
	Tri-Sync SMPTE-274M			Tri-Sync available only on Tri-Black 2, Tri-Black 3, and Tri-Black 4 outputs
Burst Amplitude Accuracy	±5%		Typically ±2%
Burst Frequency Accuracy	±1Hz		Typically ±0.25Hz
Burst Frequency Long Term	<1ppm/year		
Sync Amplitude Accuracy	±3%		Typically ±1%
SCH Phase Accuracy	±5°		
Blanking Level	±50mV		Typically ±10mV
Timing Offset	Range	Full color frame	
	Resolution NTSC and PAL	<0.5 degree of sub-carrier	
	Resolution Tri-Sync	<1/54MHz	

Notes on Field Blanking

Composite Output: NTSC-M, NTSC-J

- Field 1 lines 1 - 20 inclusive are blanked i.e. there is no pattern information but there may be VITC etc.
- Field 2 lines 263 - 283 inclusive are blanked i.e. there is no pattern information but there may be VITC etc.
 - › Line 263 and Line 283 are specified as active half lines in **SMPTE RS170M** but they are fully blanked in this SRG-2200.

Composite Output: PAL

- Field 1 lines 623 - 23 inclusive are blanked i.e. there is no pattern information but there may be VITC etc.

- › Line 623 and Line 23 are specified as active half lines in *CCIR-624* but they are fully blanked in this SRG-2200.
- Field 2 lines 311 - 336 inclusive are blanked i.e. there is no pattern information but there may be VITC etc.

SDI Output: NTSC-M, NTSC-J

- *SMPTE 125M* says 1 - 20 inclusive and 264 - 282 inclusive are blanked.
- *CCIR 656-4* says 1 - 20 inclusive and 264 - 282 inclusive are blanked.

SDI Output: PAL

- *EBU tech3267* says 624 - 22 inclusive and 311 - 335 inclusive are blanked.
- *CCIR 656-4* says 624 - 22 inclusive and 311 - 335 inclusive are blanked.

Serial Digital Interface

Table 9.3 Serial Digital Interface

Category	Performance Requirement		Reference Information
Output Connector Type	75ohm BNC		
Number of Outputs	1 BNC — SDI 1 Pattern Output		2 BNCs in total
	1 BNC — SDI 1 Color Black Output		
Output Impedance	75ohm		
Return Loss	>15dB to 270MHz		
	>15dB to 1.5GHz		
	>10dB to 3GHz		
Formats ^a	525i/625i (270Mbps)		
	720p (1.5Gbps)		
	1035i (1.5Gbps)		
	1080i (1.5Gbps)		
	1080p (3Gbps)		
Signal Amplitude	800mV ±10%		
Rise and Fall Time	270Mbps	≤600ps ±15ps	<1000ps ±500ps
	1.5Gbps	≤130ps ±20ps	<270ps ±50ps
	3Gbps	≤120ps ±15ps	<135ps ±25ps
Jitter	270Mbps	Timing: ≤0.16UI	<0.2UI @ 10Hz
		Alignment: ≤0.10UI	<0.2UI @ 1KHz
	1.5Gbps	Timing: ≤0.30UI	<1.0UI @ 10Hz
		Alignment: ≤0.07UI	<0.2UI @ 100KHz
	3Gbps	Timing: ≤0.65UI	<2.0UI @ 10Hz
		Alignment: ≤0.15UI	<0.3UI @ 100KHz

Table 9.3 Serial Digital Interface

Category	Performance Requirement		Reference Information
Timing Offset	Range	Full frame	
	Resolution 270Mbps	<1/54.00MHz	
	Resolution 1.5Gbps	<1/74.25MHz	
	Resolution 3Gbps	<1/148.50MHz	
Embedded Audio	270Mbps	Number of channels: 4 per SDI	20bit audio
	1.5Gbps	Number of channels: 16 per SDI	24bit audio
	3Gbps	Number of channels: 16 per SDI	24bit audio
	Frequency	1Hz-20KHz	1Hz resolution
	Amplitude	Silence and -78dBFS to 0dBFS	1dB resolution
	Pre-emphasis	None	
	Interruption	Programmable	1 second, 3 second, EBU TECH 3304, Glits, Blits

a. 270Mbps SDI (SMPTE 259M), 1.5Gbps SDI (SMPTE 292M), 3Gbps (SMPTE 424M)

AES/EBU Audio Unbalanced Outputs Specifications

Table 9.4 AES/EBU Audio Unbalanced Outputs

Category	Performance Requirement		Reference Information
Output Connector Type	3 x BNC		
Number of Outputs	2 x unbalanced Audio on BNC		AES-3 AES-3id
	1 x unbalanced DARS on BNC		DARS is indicated as “non-PCM audio” and “Locked” and “Grade 1 reference signal”
Output Impedance and Required Termination	75ohm		
Signal Amplitude	1V ±10%		
Rise and Fall Time	5ns > Rise/Fall < 44ns		10% to 90%
Jitter	8ns		Typically 2ns
Audio Parameters	Frequency	1Hz-20kHz	Steps of <1Hz
	Amplitude	Silence and -78dBFS to 0dBFS	1dB resolution
	Pre-emphasis	None	
	Interruption	Programmable	1 second, 3 second, EBU TECH 3304, Glits, Blits
Quantized Resolution	24bits		

LTC Output

Table 9.5 1LTC Output

Category	Performance Requirement	Reference Information
Output Connector Type	BNC	
Number of Outputs	1 x unbalanced	
Signal Amplitude	1.5V ±10% Unbalanced into 1k ohm	
Type	LTC SMPTE-12M	

Word Clock Unbalanced Output

Table 9.6 Word Clock Unbalanced Output

Category	Performance Requirement	Reference Information
Output Connector Type	1 x BNC	
Output impedance and required termination	75ohm	
Signal Amplitude	3.3V ± 10%	CMOS compatible
Jitter	8n	Typically 2ns
Pulse Type	Word clock 48KHz	
Individually programmed	Word Clock 44.1KHz	
	F1 / L7 or F1 / L10	
	6Hz/30Hz	
	6Hz/29.97Hz	

Ethernet Interface

The 100Base-T network port is used for status and control (DashBoard). In an environment where broadcast and/or multicast traffic is present e.g. PTP messaging, it is important to limit the number of broadcast and/or multicast messages that reach the 100Base-T port to a very low number. This is normally configured in the *Storm Control* configuration of your network router. A limit of zero broadcast and/or multicast messages is recommended. If this is not available then choose < 10 broadcast and/or multicast messages per second.

Table 9.7 Ethernet Interface

Category	Performance Requirement	Reference Information
Connector Type	1 x RJ45 - 8P8C	
IEEE Standards Compliance	IEEE 802.3i-1990	10BASE-T
	IEEE 802.3u-1995	100BASE-TX

Physical Specifications

Clearance

Table 9.8 Clearance Requirements

Category	Performance Requirement		Reference Information
Clearance	Side	50mm (2.00")	
	Rear	75mm (3.00")	

Mechanical Characteristics

Table 9.9 Mechanical Specifications

Category	Performance Requirement		Reference Information
Dimensions	Height	43.5mm (1.71")	
	Width	482.5mm (19.00")	
	Depth	405mm (15.95")	

Environment Characteristics

Table 9.10 Environment Characteristics

Category	Performance Requirement		Reference Information
Temperature	Operating		0°C to +40°C
	Non-operating		-20°C to +60°C
Relative Humidity	Operating		20% to 80% relative humidity (%RH) at up to +40°C, non-condensing
	Non-operating		5% to 90% relative humidity (%RH) at up to +60°C, non-condensing
Altitude	Operating		To 2,000m (6,561ft)
	Non-operating		To 12,192m (40,000ft)
Vibration	Operating		2.65m/s ² (0.27Grms), 5Hz to 500Hz, 10 minutes per axis, three axes
	Non-operating		22.3m/s ² (2.28Grms), 5Hz to 500Hz, 10 minutes per axes, three axes
Shock	Non-operating		294m/s ² (30G), half-sine, 11ms duration

Certifications and Compliances

Certifications and Compliances

Table 10.1 EC Declaration of Conformity - EMC

Category	Standards or Description	
EC Declaration of Conformity - EMC	Meets the intent of Directive 89/336/EEC for Electromagnetic Compatibility. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities.	
	EN55103	
	Environmental	E2-commercial and light industrial
	Part 1 Emission	EN55022 Class A
		EN55103-1, Annex A Radiated magnetic field emissions
		EN55103-1, Annex B Inrush current; I peak=14.6 amps
	Part 2 Immunity	IEC61000-4-2 Electrostatic discharge immunity
		IEC61000-4-3 RF electromagnetic field immunity
		IEC61000-4-4 Electrical fast transient/burst immunity
		IEC61000-4-5 Power line surge immunity
IEC61000-4-6 Conducted RF immunity		
IEC61000-4-11 Voltage dips and interruptions immunity		
EN55103-2, Annex A Radiated magnetic field immunity		
EN61000-3-2 — AC power line harmonic current emissions		
EN61000-3-3 — Voltage changes, fluctuations, and flicker		
EC Declaration of Conformity - Safety	<p>Compliance was demonstrated to the following specification as listed in the Official Journal of the European Union:</p> <ul style="list-style-type: none"> • EN 60950-1:2006/A2:2013 • IEC 60950-1:2005/A2:2013 	
Australia/New Zealand Declaration of Conformity -EMC	Complies with the EMC Framework, demonstrated per Emission Standard AS/NZS 2064 (Industrial, Scientific, and Medical Equipment).	
Safety	<p>Complies with the following safety standards:</p> <ul style="list-style-type: none"> UL 60950-1, 2nd Edition CSA C22.2 No. 60950-1-07 EN 60950-1:2006/A2:2013 IEC 60950-1:2005/A2:2013 	

Table 10.1 EC Declaration of Conformity - EMC

Category	Standards or Description	
Installation (over voltage) Category	<p>Terminals on this product may have different installation (over-voltage) category designations.</p> <p>The installation categories are:</p> <ul style="list-style-type: none"> • CAT III — Distribution-level mains (usually permanently connected). Equipment at this level is typically in a fixed industrial location. • CAT II — Local-level mains (wall sockets). Equipment at this level includes appliances, portable tools, and similar products. Equipment is usually cord-connected. • CAT I — Secondary (signal level) or battery operated circuits of electronic equipment. 	
Pollution Degree	<p>A measure of the contaminates that could occur in the environment around and within a product. Typically the internal environment inside a product is considered to be the same as the external. Products should be used only in the environment for which they are rated.</p>	
	Pollution Degree 2	<p>Normally only dry, non-conductive pollution occurs. Occasionally, a temporary conductivity that is caused by condensation must be expected. This location is a typical office/home environment. Temporary condensation occurs only when the product is out of service.</p>
Manufacturing	<p>All assemblies manufactured in an ISO9001:2008 registered facility. Steel is 18swg (1.2mm) thickness CR4GP (Cold Reduced Mill Finish General Purpose) to BS 1449 Plating is zinc and clear passivated to BS EN 12329:2000 FE//ZN8//A (FE = Steel, ZN8 = 8 mic minimum zinc deposit, A = clear passivation).</p>	
	<p>All assemblies manufactured in accordance to IPC-A-610E class 2 suitability standard.</p>	
	<p>All assemblies manufactured in accordance to ISO14001:2004 environmental standard.</p>	
IEC Characteristics	Equipment Type: Test and Measuring	<ul style="list-style-type: none"> • Installation Category II (Single-phase, receptacle -connected loads) • Pollution Degree 2 (Normally only non-conductive pollution occurs) • Safety Class I (Grounded product) • Temperature 5°C to 40°C

Characters for Idents

Notes about Compatibility Characters

- Characters in Idents come from an intersection list of the first 256 characters from Unicode and the allowable characters in XML 1.1.
- Document authors are encouraged to avoid “compatibility characters”, as defined in Unicode.
- The characters defined in the following ranges are also discouraged. They are either control characters or permanently undefined Unicode characters.

[#x1-#x8], [#xB-#xC], [#xE-#x1F], [#x7F-#x84], [#x86-#x9F],
 [#xFDD0-#xFDDF],
 [#x1FFFE-#x1FFFF], [#x2FFFE-#x2FFFF], [#x3FFFE-#x3FFFF],
 [#x4FFFE-#x4FFFF], [#x5FFFE-#x5FFFF], [#x6FFFE-#x6FFFF],
 [#x7FFFE-#x7FFFF], [#x8FFFE-#x8FFFF], [#x9FFFE-#x9FFFF],
 [#xAFFFE-#xAFFFF], [#xBFFFE-#xBFFFF], [#xCFFFE-#xCFFFF],
 [#xDFFFE-#xDFFFF], [#xEFFFE-#xEFFFF], [#xFFFFE-#xFFFFF],
 [#x10FFFE-#x10FFFF]

- XML 1.1 explicitly excludes the following characters:
 [0x01-0x08], [0x0b-0x0c], [0x0E-0x1F], [0x7f-0x84], [0x86-0x9f]

Characters Available

Table 11.1 lists the supported characters. Unsupported characters are set in grey. Generally, if an unsupported character is detected, it will be replaced with the ‘space’ character 0x20.

Table 11.1 Available Characters for Idents 000-007

	000	001	002	003	004	005	006	007
0	NUL	DLE	SP	0	@	P	‘	p
1	SOH	DC1	!	1	A	Q	a	q
2	STX	DC2	“	2	B	R	b	r
3	ETX	DC3	#	3	C	S	c	s
4	EOT	DC4	\$	4	D	T	d	t
5	ENQ	NAK	%	5	E	U	e	u
6	ACK	SYN	&	6	F	V	f	v

Table 11.1 Available Characters for Idents 000-007

	000	001	002	003	004	005	006	007
7	BEL	ETB	'	7	G	W	g	w
8	BS	CAN	(	8	H	X	h	x
9	HT	EM	)	9	I	Y	i	y
A	LF	SUB	*	:	J	Z	j	z
B	VT	ESC	+	;	K	[	k	{
C	FF	FS	,	<	L	\	l	|
D	CR	GS	-	=	M	]	m	}
E	SO	RS	.	>	N	^	n	~
F	SI	US	/	?	O	_	o	DEL

Table 11.2 Available Characters for Idents 008-00F

	008	009	00A	00B	00C	00D	00E	00F
0	XXX	DCS	NB SP	°	À	Đ	à	đ
1	XXX	PU1	ı	±	Á	Ñ	á	ñ
2	BPH	PU2	ç	²	Â	Ò	â	ò
3	NBH	STS	£	³	Ã	Ó	ã	ó
4	IND	CCH	œ	'	Ä	Ô	ä	ô
5	NEL	MW	¥	μ	Å	Õ	å	õ
6	SSA	SPA	|	¶	Æ	Ö	æ	ö
7	ESA	EPA	§	·	Ç	×	ç	÷

Table 11.2 Available Characters for Idents 008-00F

	008	009	00A	00B	00C	00D	00E	00F
8	HTS	SOS	¨	,	È	Ø	è	ø
9	HTJ	XXX	©	ı	É	Ù	é	ù
A	VTS	SCI	ª	º	Ê	Ú	ê	ú
B	PLQ	CSI	«	»	Ë	Û	ë	û
C	PLU	ST	¬	¼	Ì	Ü	ì	ü
D	RI	OSC	SHY	½	Í	Ý	í	ý
E	SS2	PM	®	¾	Î	Ɔ	î	ɔ
F	SS3	APC	—	¿	Ï	ß	ï	ÿ

Test Patterns

This chapter provides an overview of the test patterns available for the SRG-2200. The patterns are stored in a pattern file in FLASH memory. The pattern file can be updated via the Ethernet interface. A slightly different set of test patterns is available for each signal format.

525i Test Patterns

```
"black", //0
"white100", //1
"yellow100", //2
"cyan100", //3
"green100", //4
"magenta100", //5
"red100", //6
"blue100", //7
"rp219_000_p2white100_p3Black ", //8
"rp219_001_p2white075_p3Black ", //9
"rp219_002_p2nI_p3Black ", //10
"rp219_003_p2pI_p3pQ ", //11
"rp219_001_p2white075_p3Black_Lip_Sync", //12
"EBU3305", //13
"EBU3305_Lip_Sync", //14
"16x12hardgrille_blacksquare ", //15
"16x12softgrille_blacksquare ", //16
"16x12hardgrille_white050square", //17
"16x12softgrille_white050square", //18
"16x9hardgrille_white050square ", //19
"16x9softgrille_blacksquare ", //20
"16x9hardgrille_white050square ", //21
"16x9softgrille_white050square ", //22
"bar100_9", //23
"bar100_9_red100", //24
"bar100_8", //25
"bar100_8_red100", //26
"bar095_9", //27
"bar095_9_red095", //28
"bar095_8", //29
```

"bar095_8_red095	",	//30
"bar075_9	",	//31
"bar075_9_red075	",	//32
"bar075_8	",	//33
"bar075_8_red075	",	//34
"barebu_9	",	//35
"barebu_9_red075	",	//36
"barebu_8	",	//37
"barebu_8_red075	",	//38
"barsmpte	",	//39
"PLUGE	",	//40
"pathological_type1	",	//41
"pathological_type2	",	//42
"multiburst_Full_Mono	",	//43
"multiburst_Half_Mono	",	//44
"multiburst_Half_Luma_Full_Chro",		//45
"multiburst_Half_Luma_Half_Chro",		//46
"sweep_Full_Mono	",	//47
"sweep_Half_Mono	",	//48
"sweep_Half_Luma_Full_Chroma "		//49
"sweep_Half_Luma_Half_Chroma "		//50
"100%_valid_ramps_1	",	//51
"Luma_ramp_full_width_1	",	//52
"Cb_ramp_full_width_1	",	//53
"Cr_ramp_full_width_1	",	//54
"All_ramps_full_width_1	",	//55
"Field_Sequence0_F0_to_F3	",	//56
"Field_Sequence1_F1_to_F4	",	//57
"Sinxx_Pulses	",	//58
"7_T_Pulses	",	//59

625i Test Patterns

"black	",	//0
"white100	",	//1
"yellow100	",	//2
"cyan100	",	//3
"green100	",	//4
"magenta100	",	//5
"red100	",	//6
"blue100	",	//7
"rp219_000_p2white100_p3Black	",	//8
"rp219_001_p2white075_p3Black	",	//9
"rp219_002_p2nI_p3Black	",	//10
"rp219_003_p2pI_p3pQ	",	//11
"rp219_001_p2white075_p3Black_Lip_Sync"		//12
"EBU3305	",	//13
"EBU3305_Lip_Sync	",	//14
"16x12hardgrille_blacksquare	",	//15
"16x12softgrille_blacksquare	",	//16
"16x12hardgrille_white050square"		//17
"16x12softgrille_white050square"		//18
"16x9hardgrille_white050square	",	//19
"16x9softgrille_blacksquare	",	//20
"16x9hardgrille_white050square	",	//21
"16x9softgrille_white050square	",	//22
"bar100_9	",	//23
"bar100_9_red100	",	//24
"bar100_8	",	//25
"bar100_8_red100	",	//26
"bar095_9	",	//27
"bar095_9_red095	",	//28
"bar095_8	",	//29
"bar095_8_red095	",	//30
"bar075_9	",	//31
"bar075_9_red075	",	//32
"bar075_8	",	//33
"bar075_8_red075	",	//34
"barebu_9	",	//35
"barebu_9_red075	",	//36

"barebu_8	",	//37
"barebu_8_red075	",	//38
"barsmpte	",	//39
"PLUGE	",	//40
"pathological_type1	",	//41
"pathological_type2	",	//42
"multiburst_Full_Mono	",	//43
"multiburst_Half_Mono	",	//44
"multiburst_Half_Luma_Full_Chro",		//45
"multiburst_Half_Luma_Half_Chro",		//46
"sweep_Full_Mono	",	//47
"sweep_Half_Mono	",	//48
"sweep_Half_Luma_Full_Chroma "		//49
"sweep_Half_Luma_Half_Chroma "		//50
"100%_valid_ramps_1	",	//51
"Luma_ramp_full_width_1	",	//52
"Cb_ramp_full_width_1	",	//53
"Cr_ramp_full_width_1	",	//54
"All_ramps_full_width_1	",	//55
"Field_Sequence0_F0_to_F7	",	//56
"Field_Sequence1_F1_to_F8	",	//57
"Sinxx_Pulses	",	//58
"7_T_Pulses	",	//59

720p Test Patterns

"black	",	//0
"white100	",	//1
"yellow100	",	//2
"cyan100	",	//3
"green100	",	//4
"magenta100	",	//5
"red100	",	//6
"blue100	",	//7
"rp219_000_p2white100_p3Black	",	//8
"rp219_001_p2white075_p3Black	",	//9
"rp219_002_p2nI_p3Black	",	//10
"rp219_003_p2pI_p3pQ	",	//11
"rp219_Lip_Sync	",	//12
"EBU3305	",	//13
"EBU3305_Lip_Sync	",	//14
"16x9hardgrille_blacksquare	",	//15
"16x9softgrille_blacksquare	",	//16
"16x9hardgrille_white050square	",	//17
"16x9softgrille_white050square	",	//18
"bar100_9	",	//19
"bar100_9_red075	",	//20
"bar100_8	",	//21
"bar100_8_red075	",	//22
"bar095_9	",	//23
"bar095_9_red075	",	//24
"bar095_8	",	//25
"bar095_8_red075	",	//26
"bar075_9	",	//27
"bar075_9_red075	",	//28
"bar075_8	",	//29
"bar075_8_red075	",	//30
"barebu_9	",	//31
"barebu_9_red075	",	//32
"barebu_8	",	//33
"barebu_8_red075	",	//34
"pathological_frame0	",	//35
"pathological_frame1	",	//36

```
"multiburst_full_mono      ",           //37
"multiburst_half_mono     ",           //38
"multiburst_Half_Luma_Full_Chro",      //39
"multiburst_half_color    ",           //40
"sweep_full_mono          ",           //41
"sweep_half_mono          ",           //42
"sweep_Half_Luma_Full_Chroma ",        //43
"sweep_half_color         ",           //44
"100%_valid_ramps_1      ",           //45
"100%_valid_ramps_2      ",           //46
"7_T_Pulses               ",           //47
```

1035i Test Patterns

"black	",	//0
"white100	",	//1
"yellow100	",	//2
"cyan100	",	//3
"green100	",	//4
"magenta100	",	//5
"red100	",	//6
"blue100	",	//7
"rp219_000_p2white100_p3Black	",	//8
"rp219_001_p2white075_p3Black	",	//9
"rp219_002_p2nI_p3Black	",	//10
"rp219_003_p2pI_p3pQ	",	//11
"EBU3305	",	//12
"16x9hardgrille_blacksquare	",	//13
"16x9softgrille_blacksquare	",	//14
"16x9hardgrille_white050square	",	//15
"16x9softgrille_white050square	",	//16
"bar100_9	",	//17
"bar100_9_red075	",	//18
"bar100_8	",	//19
"bar100_8_red075	",	//20
"bar095_9	",	//21
"bar095_9_red075	",	//22
"bar095_8	",	//23
"bar095_8_red075	",	//24
"bar075_9	",	//25
"bar075_9_red075	",	//26
"bar075_8	",	//27
"bar075_8_red075	",	//28
"barebu_9	",	//29
"barebu_9_red075	",	//30
"barebu_8	",	//31
"barebu_8_red075	",	//32
"pathological_frame0	",	//33
"pathological_frame1	",	//34
"multiburst_full_mono	",	//35
"multiburst_half_mono	",	//36

```
"multiburst_Half_Luma_Full_Chro", //37
"multiburst_half_color ", //38
"sweep_full_mono ", //39
"sweep_half_mono ", //40
"sweep_Half_Luma_Full_Chroma ", //41
"sweep_half_color ", //42
"100%_valid_ramps_1 ", //43
"100%_valid_ramps_2 ", //44
"7_T_Pulses ", //45
```

1080i and 1080PsF Test Patterns

"black", //0
"white100", //1
"yellow100", //2
"cyan100", //3
"green100", //4
"magenta100", //5
"red100", //6
"blue100", //7
"rp219_000_p2white100_p3Black", //8
"rp219_001_p2white075_p3Black", //9
"rp219_002_p2nI_p3Black", //10
"rp219_003_p2pI_p3pQ", //11
"rp219_Lip_Sync", //12
"EBU3305", //13
"EBU3305_Lip_Sync", //14
"16x9hardgrille_blacksquare", //15
"16x9softgrille_blacksquare", //16
"16x9hardgrille_white050square", //17
"16x9softgrille_white050square", //18
"bar100_9", //19
"bar100_9_red075", //20
"bar100_8", //21
"bar100_8_red075", //22
"bar095_9", //23
"bar095_9_red075", //24
"bar095_8", //25
"bar095_8_red075", //26
"bar075_9", //27
"bar075_9_red075", //28
"bar075_8", //29
"bar075_8_red075", //30
"barebu_9", //31
"barebu_9_red075", //32
"barebu_8", //33
"barebu_8_red075", //34
"pathological_frame0", //35
"pathological_frame1", //36

"multiburst_full_mono ", //37
"multiburst_half_mono ", //38
"multiburst_Half_Luma_Full_Chro", //39
"multiburst_half_color ", //40
"sweep_full_mono ", //41
"sweep_half_mono ", //42
"sweep_Half_Luma_Full_Chroma ", //43
"sweep_half_color ", //44
"100%_valid_ramps_1 ", //45
"100%_valid_ramps_2 ", //46
"7_T_Pulses ", //47

1080p Test Patterns

"black", //0
"white100", //1
"yellow100", //2
"cyan100", //3
"green100", //4
"magenta100", //5
"red100", //6
"blue100", //7
"rp219_000_p2white100_p3Black", //8
"rp219_001_p2white075_p3Black", //9
"rp219_002_p2nI_p3Black", //10
"rp219_003_p2pI_p3pQ", //11
"rp219_Lip_Sync", //12
"EBU3305", //13
"EBU3305_Lip_Sync", //14
"16x9hardgrille_blacksquare", //15
"16x9softgrille_blacksquare", //16
"16x9hardgrille_white050square", //17
"16x9softgrille_white050square", //18
"bar100_9", //19
"bar100_9_red075", //20
"bar100_8", //21
"bar100_8_red075", //22
"bar095_9", //23
"bar095_9_red075", //24
"bar095_8", //25
"bar095_8_red075", //26
"bar075_9", //27
"bar075_9_red075", //28
"bar075_8", //29
"bar075_8_red075", //30
"barebu_9", //31
"barebu_9_red075", //32
"barebu_8", //33
"barebu_8_red075", //34
"pathological_frame0", //35
"pathological_frame1", //36

"multiburst_full_mono ", //37
"multiburst_half_mono ", //38
"multiburst_Half_Luma_Full_Chro", //39
"multiburst_half_color ", //40
"sweep_full_mono ", //41
"sweep_half_mono ", //42
"sweep_Half_Luma_Full_Chroma ", //43
"sweep_half_color ", //44
"100%_valid_ramps_1 ", //45
"100%_valid_ramps_2 ", //46
"7_T_Pulses ", //47

NTP Option

This chapter provides information on installing the NTP option for your SRG-2200.

Overview

The SRG-2200 always contains the hardware, software and associated circuitry necessary to allow operation of the NTP Option.

An Option Key is used to enable the NTP Option (refer to the section “**Options Tab**” on page 53 for details). No additional externally connected hardware is required as part of the installation. A power cycle may be required to complete the update process.

In order to utilize the NTP Option, simply use an Ethernet cable to connect the SRG-2200 to your local network device (master router or local hub).

Follow the instructions in the section “**Network Tab**” on page 52 and “**NTP Time (from Server) Tab**” on page 48 to configure the Network and NTP systems with your required parameters.

Background Information

A good source of reference time is the Network Time Protocol available on most commercial Ethernet networks. Note: No frequency or phase can be accurately inferred from the NTP system.

The SRG-2200 NTP system can only be configured as a NTP Client where the SRG-2200 requests time from a NTP server.

NTP Client

As the SRG-2200 is powered, the NTP Client begins requesting time from the designated remote NTP server. The NTP Client will keep searching for a time until it gets one.

The NTP operational parameters can be monitored in the LCD menu, and on the Dashboard remote control program.

Default Settings

The default settings of the NTP system are as follows:

- SPG IP address 192.168.001.044
- SPG IP mask 255.255.255.000
- SPG IP Gateway 192.168.001.254
- Remote NTP Server IP address 139.143.005.030.

Time Locking

Time lock is achieved by reading the NTP time from the NTP Server and calculating an appropriate time-code. NTP locks the SRG-2200 central timing system.

Keep the following mind:

- The time-code needs to be checked and updated each time the NTP Server is detected.
- However in marginal networks the “question-response” message times may be so variable the time-code update should be suppressed until it has been valid for a number of seconds.
- Once the time-code has been set by the NTP Client, the SRG-2200 should not need to re-check the NTP time unless a crash lock has been forced by the phase locking arrangement.

Simplified NTP Flowcharts

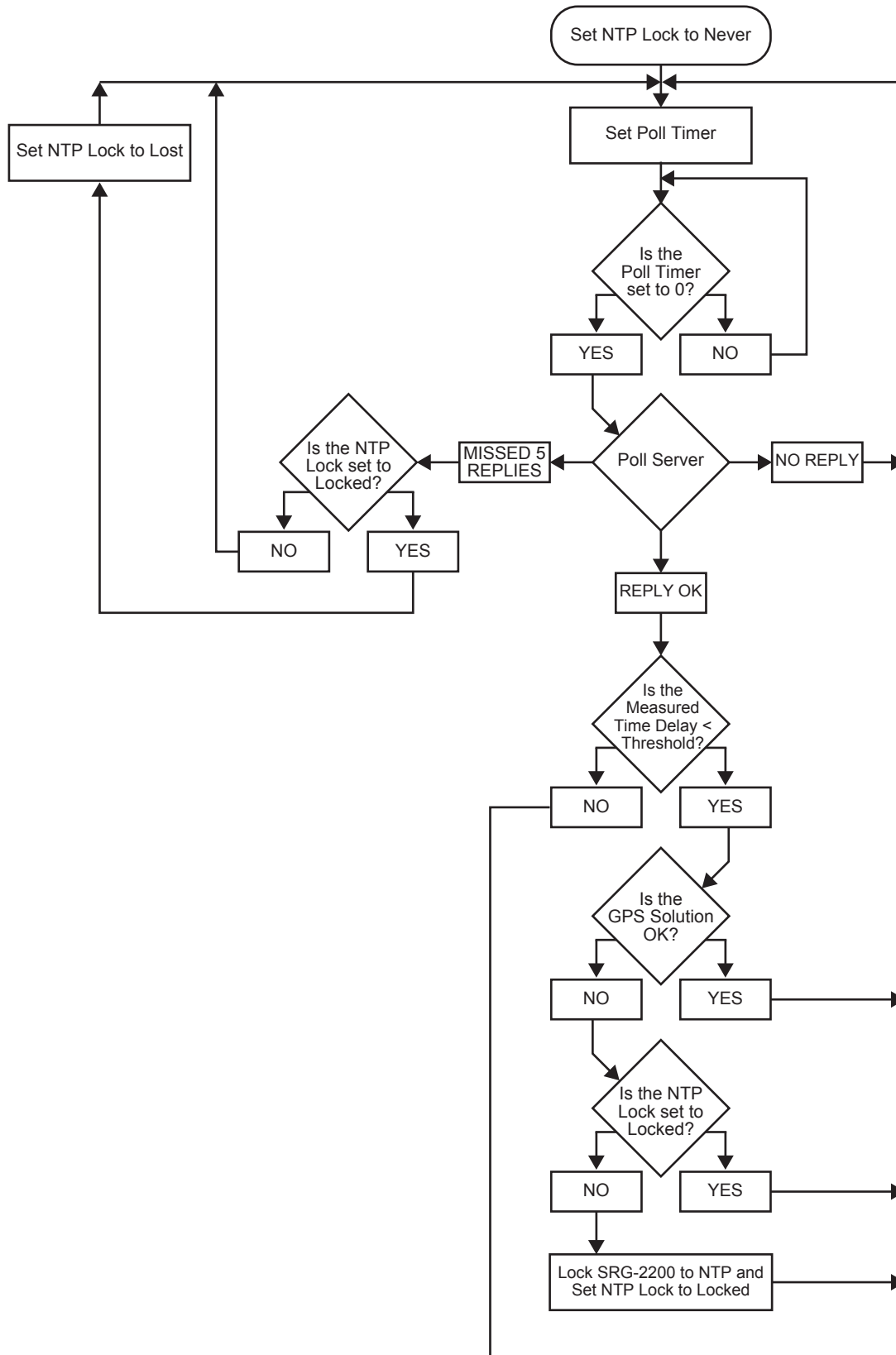


Figure 13.1 NTP Client Flowchart

Required Time Corrections

From an NTP Server, the SRG-2200 Master Clock can derive UTC and also add the appropriate time offset and provide corrected local time. **Table 13.1** contains a list of the various corrections which need to be made by the SRG-2200.

Table 13.1 Required Time Corrections

		Offset	SRG-2200 Update
1	Earth Speed Drift in 1 day	1ms	Leap second corrections are made approximately every 18 months as determined by International Earth Rotation Service (IERS).
2	Local Time	User defined	The user usually defines the offset from UTC at time of installation
3	Daylight Saving	1 hour	Twice per year

Date in the User Bits of Timecode

This chapter provide an overview of how the SRG-2200 inserts and reads the user bits in time code to decode date and time zone information.

The SRG-2200 supports two methods of date information in the user bits of LTC and VITC:

- *SMPTE 309M-1999* using YYMMDD format, with or without encoded time zone information
- *EBU I29-1995/ITU-R BR.1353 Appendix 2* or commonly known in the industry as ITU/Legacy/BBC format

SMPTE S309 (YYMMDD Format)	VITC Bit Number	ITU/Legacy/BBC
BG1		
Day units	6	Reserved - set to 0
	7	
	8	
	9	
BG2		
10s of Day units	16	Day units
	17	
	18	
	19	
BG3		
Month units	26	Month units
	27	
	28	
	29	
BG4		
10s of Month units	36	Day10s of units
	37	Day 10s of units
	38	Month 10s of units
	39	Reserved - set to 0
BG5		
Year Units	46	Reserved - set to 0
	47	
	48	
	49	
BG6		
Year 10s of units	56	Year units
	57	
	58	
	59	

SMPTE S309 (YYMMDD Format)	VITC Bit Number	ITU/Legacy/BBC
BG7		
Optional Time Zone - 0	66	Reserved - set to 0
Optional Time Zone - 1	67	
Optional Time Zone - 2	68	
Optional Time Zone - 3	69	
BG8		
Optional Time Zone - 4	76	Year 10s of units
Optional Time Zone - 5	77	
Reserved - set to 0	78	
YYMMDD Format = 0	79	

Service Information

This chapter contains procedures for cleaning and performing preventive maintenance on the SRG-2200, general servicing information, and the warranty policies.

User Maintenance

This section contains information for cleaning and performing preventive maintenance on the SRG-2200.

General Care

Protect the instrument from adverse conditions, i.e. high humidity, high temperatures, etc. The instrument is NOT waterproof.

When handling the unit or any of its controls, do so with clean hands.

Do not use excessive force to operate any of the controls on the unit.

Exterior Cleaning

Clean the instrument periodically to prevent the accumulation of dust or dirt. Accumulated dust in the instrument acts like an insulating blanket, preventing proper cooling, resulting in overheating and ultimately premature component breakdown. Under high humidity conditions, accumulated dust can also result in an electrically conductive path.



Warning — *To avoid personal injury, always remove the power cord before cleaning the instrument.*

A vacuum cleaner may be used to remove accumulated dust on the outside of the instrument. Ensure that the nozzle is fitted with a soft brush head (or similar) to avoid damaging the instrument.



Caution — *Avoid exposing the instrument to liquids, sprays or solvents, as this could damage the unit. Cleaning agents may also damage the instrument. Avoid solutions that contain harmful chemicals such as Acetone, Benzene, Toluene, Xylene, or similar.*

If the exterior surfaces or controls of the instrument require further cleaning, use a dry, lint-free cloth or a soft-bristle brush. If dirt remains, use a cloth or swab dampened with a 75% isopropyl alcohol solution. A swab is useful for cleaning in narrow spaces around the controls and connectors. Do not use excessive amounts of the approved cleaning solution when cleaning the instrument. Do not use abrasive compounds on any part of the instrument.



Caution — *Do not allow moisture or dust to enter the instrument during exterior cleaning. Only use enough solution to mildly dampen a cloth or similar. After cleaning, use de-ionized water on a clean cloth to “rinse” the instrument.*

Preventive Maintenance

Preventive Maintenance mainly consists of periodic cleaning. Periodic cleaning reduces instrument breakdown and increases reliability. Clean the instrument whenever needed (using the guidelines outlined above), based on the operating environment. Dirty conditions may require more frequent cleaning than a conventional “clean room” environment.

Servicing

The SRG-2200 should require little or no in-service maintenance to the installed electronics. Provided the measures outlined in the section “**Preventive Maintenance**” on page 91 are adhered to, the product should perform for several years without any major user intervention.

Maintenance of components within the product is not usually required, except under exceptional circumstances. If a fault occurs, please follow the instructions listed in the chapter “**Troubleshooting**” on page 57 before attempting to service the product. The servicing of any of the internal components requires the unit to be extracted from the bay and the top cover removed. If your problem cannot be resolved, contact Ross Video for further advice.

If you ordered a Service Option, then removing the unit from the bay and returning it to Ross Video for updating will provide the user with the opportunity to inspect the unit for any problems relating to the operating conditions/environment.

Service Safety Overview

Only qualified personnel should perform service procedures. Read this section before performing any service procedures.

- **Do Not Service Alone.** Do not perform internal service or adjustments of this product unless another person capable of rendering first aid and resuscitation is present.
- **Disconnect Power.** To avoid electric shock, switch off the power to the instrument, then disconnect the power cord from the mains power.
- **Use Care When Servicing With Power On.** Dangerous voltages or currents may exist in this product. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.
- **Observe Static Precautions.** Servicing of this product should be performed only in a static-safe environment, i.e. at a suitably configured ESD Workstation. Always use a Static Grounding Wrist-Strap connected to the ESD Workstation mat while servicing the product.
- To avoid electric shock, do not touch exposed connections.

Important Information Regarding the use of Switch Cleaners

Switch Cleaner products usually contain a lubricating additive (along with the “alcohol- based” propellant), intended to remain after spraying into relevant components.

Some equipment produced by Ross Video contains components that should not be cleaned using these types of cleaners, due to the compact nature of the components, their operating characteristics, or their inaccessibility. This is because push-buttons, for example, rely on clean, dry, conductive contact surfaces to operate correctly. Applying Switch Cleaner lubricant only serves to attract dust, or worse still could “wash-in” grease and dust, which could severely reduce the conductivity of the component parts.

Therefore, Ross Video does not recommend the use of these Switch Cleaner products on their equipment, and will not be held liable for any fault caused by inadvertent or unqualified use or application of such products.

Warranty and Repair Policy

The SRG-2200 is warranted to be free of any defect with respect to performance, quality, reliability, and workmanship for a period of ONE (1) year from the date of shipment from our factory. In the event that your SRG-2200 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 SRG-2200 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 ONE (1) 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 SRG-2200 User Manual provides all pertinent information for the safe installation and operation of your Ross Video Product. Ross Video policy dictates that all repairs to the SRG-2200 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 SRG-2200, 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 SRG-2200. If required, a temporary replacement frame will be made available at a nominal charge. Any shipping costs incurred will be the responsibility of you, the customer. All products shipped to you from Ross Video Limited will be shipped collect.

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

Glossary

The following terms are used throughout this guide:

- “**Almanac**” refers to a set of parameters included in the GPS satellite navigation message that a receiver uses to predict the approximate location of a satellite. The almanac contains information about all of the satellites in the constellation.
- “**CW signals**” refers to continuous wave signals.
- “**Ephemeris**” is a description of the path of a celestial body indexed by time. The navigation message from each GPS satellite includes a predicted ephemeris for the orbit of that satellite valid for the current hour. The ephemeris is repeated every 30 seconds and is in the form of a set of 16 Keplerian-like parameters with corrections that account for the perturbations to the orbit caused by the earth’s gravitational field and other forces.
- “**Epoch**” is an instant of time (or a date) from which values of data are referenced. Note: an Era is the period of time between successive epochs.
- “**GLONASS**” refers to the Global Navigation Satellite System.
- “**GPS**” refers to global positioning system.
- “**Operator**” and “**User**” refer to the person who uses SRG-2200.
- “**RF interference**” refers to radio frequency interference.
- “**System**” and “**Video system**” refer to the mix of interconnected production and terminal equipment in your environment.
- “**UTC**” refers to Co-ordinated Universal Time. The time scale based on the atomic second but occasionally corrected, by the insertion of leap seconds, to keep it approximately synchronized with Earth’s rotation. The leap second adjustments keep UTC within 0.9 seconds UT1.

