Ross Video Limited

SYNERGY 100
DIGITAL PRODUCTION SWITCHER
MD

Engineering Manual

Software Issue: 7.2 MD-S100

ROSS
Live Production Technology™

Synergy 100 MD • Engineering Manual

- • Ross Part Number: **4400DR-101**

- • Document Issue: **7**

- • Release Date: August 30, 2007. Printed in Canada.

- • Software Issue: **7.2 MD-S100**

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Important Regulatory and Safety Notices to Service Personnel

Before using this product and any associated equipment, refer to the "**Important Safety Instructions**" listed below to avoid personnel injury and to prevent product damage.

Product may require specific equipment, and/or installation procedures to be carried out to satisfy certain regulatory compliance requirements. Notices have been included in this publication to call attention to these specific requirements.

Symbol Meanings

	Protective Earth	This symbol identifies a Protective Earth (PE) terminal, which is provided for connection of the supply system's protective earth (green or green/yellow) conductor.
		This symbol on the equipment refers you to important operating and maintenance (servicing) instructions within the Product Manual Documentation. Failure to heed this information *may present a major risk of damage or injury to persons or equipment.*
	Warning	The symbol with the word **"Warning"** within the equipment manual *indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.*
	Caution	The symbol with the word "**Caution**" within the equipment manual i*ndicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.*
	Notice	The symbol with the word "**Notice**" within the equipment manual i*ndicates a situation which, if not avoided, may result in major or minor equipment damage or a situation which could place the equipment in a non-compliant operating state.*
	Warning Hazardous Voltages	This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product enclosure that may be of sufficient magnitude to constitute a risk of shock to persons.
	ESD Susceptibility	This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event.

Important Safety Instructions

Warning

1) Read these instructions.

2) Keep these instructions.

3) Heed all warnings.

4) Follow all instructions.

5) Do not use this apparatus near water.

6) Clean only with a dry cloth.

7) Do not block any ventilation openings. Install in accordance with manufacturer's instructions.

8) Do not install near heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10) Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11) Only use attachments/accessories specified by the manufacturer.

12) Unplug this apparatus during lightning storms or when unused for long periods of time.

13) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

14) Do not expose this apparatus to dripping or splashing, and ensure that no objects filled with liquids, such as vases, are placed on the apparatus.

15) To completely disconnect this apparatus from the AC Mains, disconnect the power supply cord plug from the AC receptacle.

16) The mains plug of the power supply cord shall remain readily operable.

17) The MD or MD-X (Live Production Engine) chassis is to be rack mounted only.

Warning

18) **Indoor Use**: **WARNING**: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

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

20) **WARNING**: This apparatus, when equipped with multiple power supplies, can generate high leakage currents. To reduce the risk of electric shock, ensure that each individual supply cord is connected to its own separate branch circuit with an earth connection.

21) **CAUTION**: These service instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so (Engineering Manual only).

Caution

22) This apparatus contains Lithium batteries, which if replaced incorrectly, or with an incorrect type, may cause an explosion. Replace only with the same type. Dispose of used batteries according to the manufacturer's instruction.

23) Service barriers within this product are intended to protect the operator and service personnel from hazardous voltages. For continued safety, replace all barriers after servicing.

24) Certain parts of this equipment still present a safety hazard with the power switch in the OFF position. To avoid electrical shock, disconnect all A/C power cords from the chassis' rear appliance connectors before servicing.

25) This product contains safety critical parts, which, if incorrectly replaced, may present a risk of fire or electrical shock. Components contained within the product's power supplies and power supply area are not intended to be customer-serviced and should be returned to the factory for repair.

26) To reduce the risk of fire, replacement fuses must be the same type and rating.

27) Use only power cords specified for this product and certified for the country of use. Refer to the Product Power Cord Requirement section that follows.

28) The safe operation of this equipment requires that the user heed and adhere to all installation and servicing instruction contained within the equipment's Engineering Manuals.

Product Power Cord Requirements

⚠ Caution

North American Line Voltages 100 - 120 Volt

This product is supplied with certified 10A/125V SVT type supply cords. Conductors are color coded white (neutral), black (line), and green or green/yellow (ground).

Operation of this equipment at line voltages exceeding 130V requires that alternative supply cords with appropriate voltage and current ratings be used.

International Line Voltages 200 - 240 Volts

This product has been designed for use with certified IEC 320- C13 10A/250V - **H03 VV-F3G 1.00mm^2** type line cord.

International product orders are supplied with a certified 10A/250V line cords, utilizing a molded 3-pin IEC 320-C13 type connector at one end and stripped conductors on the other. One line cord is provided. Conductors are CEE color coded; blue (neutral), brown (line), and green/yellow (ground).

Installation by a qualified electrician, of an appropriately approved A/C wall plug certified for the country of use, is required.

Alternatively, other IEC 320 C-13 type power cords may be used, provided that they meet the necessary safety certification requirements for the country in which they are to be used. Refer to the correctly specified line cord above.

EMC Notices

United States of America

FCC Part 15

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

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

CANADA

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

Cet appariel numerique de la classe "A" est conforme a la norme NMB-003 du Canada.

EUROPE

This equipment is in compliance with the essential requirements and other relevant provisions of **CE Directive 93/68/EEC**.

INTERNATIONAL

This equipment has been tested to **CISPR 22:1997** along with amendments **A1:2000** and **A2:2002**, and found to comply with the limits for a Class A Digital device.

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

General Handling Guidelines

- Careful handling, using proper ESD precautions, must be observed.

- Power down the system before PCB removal.

A Word About Static Discharge

Throughout the many procedures in this Engineering Manual, please observe all static discharge precautions.

	Notice	Avoid handling the switcher circuit boards in high static environments such as carpeted areas, and when synthetic fiber clothing is worn. Touch the frame to dissipate static charge before removing boards from the frame, and exercise proper grounding precautions when working on circuit boards.

Warranty and Repair Policy

Ross Video Limited (Ross) warrants its switchers and related options, to be free from defects under normal use and service for a period of THREE YEARS from the date of shipment. Fader handle assemblies are warranted for the life of the product. If an item becomes defective within the warranty period Ross will repair or replace the defective item, as determined solely by Ross.

Warranty repairs will be conducted at Ross, with all shipping FOB Ross dock. If repairs are conducted at the customer site, reasonable out-of-pocket charges will apply. At the discretion of Ross, and on a temporary loan basis, plug in circuit boards or other replacement parts may be supplied free of charge while defective items undergo repair. Return packing, shipping, and special handling costs are the responsibility of the customer.

Software upgrades for switchers, as defined by Ross, may occur from time to time. Ross will notify customers of such upgrades and, subject to a customer-initiated request, such upgrades will be provided free of charge within three years of the original ship date, with shipping FOB Ross dock.

This warranty is void if products are subjected to misuse, neglect, accident, improper installation or application, or unauthorized modification.

In no event shall Ross Video Limited be liable for direct, indirect, special, incidental, or consequential damages (including loss of profit). Implied warranties, including that of merchantability and fitness for a particular purpose, are expressly limited to the duration of this warranty.

This warranty is TRANSFERABLE to subsequent owners, subject to Ross' notification of change of ownership.

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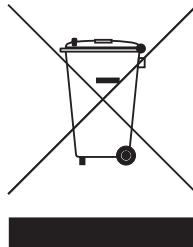
If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

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

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Synergy 100 MD Engineering Manual (v7.2 MD-S100)

Introduction

A Word of Thanks

Congratulations on choosing the Ross **Synergy 100 MD Live Production Engine**. You have purchased the power and versatility of an advanced Multi-Level Effects (MLE) digital switcher that is ready to take on all creative challenges in today's competitive broadcast environment. You will be pleased at how easily your Synergy 100 MD switcher fits into your working environment.

About This Manual

This manual covers the installation of the Synergy 100 MD switcher. It takes you through physical installation, system configuration, and the steps required to integrate your switcher with peripheral equipment. The following chapters are included:

- The **Front Matter** of this manual includes information on the warranty and repair policy, and all regulatory and safety notices and compliance issues.

- Chapter 1, "**Introduction**" summarizes the manual and describes the components and features that comprise the Synergy MD system.

- Chapter 2, "**System Architecture**" describes the frame boards, the overall system block diagram, and provides an explanation of how video flows through the unit.

- Chapter 3, "**Physical Installation**" provides instructions for installing Synergy 100 MD switcher hardware.

- Chapter 4, "**Preliminary Cabling and Video Installation**" outlines procedures for making basic control panel, frame, reference, and monitor connections, as well as video and Key signal connections to all areas of the switcher. A preliminary functional check procedure is provided.

- Chapter 5, "**Using the Menu System**" provides an introduction to the menu system of the Synergy 100 MD switcher.

- Chapter 6, "**Software Upgrades and Options**" provides information on verifying installed options, frame and panel board revision numbers, and the serial numbers. Also included are instructions for upgrading system software and for installing a variety of software options.

- Chapter 7, "**BNC Configuration and Check**" provides instructions for configuring and checking your BNC inputs.

- Chapter 8, "**Output Configuration**" provides instructions for additional setup procedures such as setting up Aux Buses, clean feed, GPI, Multi-DSK, favorite CG, Fade to Black, and tallies.

- Chapter 9, "**Communications Setup**" provides instructions for setting up communications parameters with peripheral equipment such as VTRs, and editors.

- Chapter 10, "**Remote Aux Panels**" provides instructions for installing and setting up Remote Aux Panels.

- Chapter 11, "**Completing Setup**" provides instructions for storing switcher configurations on disk, resetting factory defaults, setting up Custom Control banks, and setting up various other switcher features.

- Chapter 12, "**Calibration and Diagnostics**" provides information on the full array of the Synergy MD switcher's diagnostic tools, and procedures for calibrating all analog controls.

- Chapter 13, "**Power Supplies and Fans**" provides information on replacing and calibrating control panel power supplies and replacing frame power supplies and fans.

- Chapter 14, "**Frame Boards**" provides basic information about all of the primary system boards located inside the Synergy MD frame.

- Chapter 15, "**Control Panel Boards**" provides details about all the boards in each of the Synergy MD control panels, and the layout of the panel CPU Board.

- Chapter 16, "**Hardware Options**" provides instruction for installing a variety of hardware options.

- Appendix A, "**Specifications**" provides technical specifications and connector pinout diagrams.

- Appendix B, "**Peripheral Device Specifics**" provides technical information for specific peripheral equipment that the Synergy MD switcher interfaces with.

- Appendix C, "**Installation Worksheets**" gathers all the various blank worksheets for planning and recording switcher installation and wiring connections into one place for your convenience.

- Appendix D, "**IP and Web Issues**" provides information on standard network security practices and IP configuration.

- The **Glossary** provides a reference list of important switching and video terms used throughout this manual.

- An **Index** is also provided for your reference.

If, at any time, you have a question pertaining to the installation of your Ross **Synergy 100 MD Switcher**, please contact us at the numbers listed in the front of this manual. Our technical staff are always available for consultation, training, or service.

Documentation Conventions

The following conventions are used throughout this manual:

- Rear panel connectors are indicated in bold-faced upper case letters. For example:

   The **AUX 1** connector is…

- Control Panel buttons are indicated in bold-faced upper case letters, using a sans-serif font. For example:

   Press **WIPE** to…

- Menu names on the preview overlay and switcher control panel areas are indicated in bold-faced text. For example:

   The **Inputs Menu** allows you to …

   The **Downstream Keyer** Group consists of …

- The "**Operating Tips**" table and "**Note**" table are used throughout this manual to provide customers with additional useful information. For example:

✓ **Operating Tip**	For wiring convenience, it is recommended that you make your tally associations on a 1:1 basis, with tally numbers matching input BNC numbers (for example, Input **8** assigned to Tally **8**).

🖎 **Note**	If you wish to add options to your switcher, please contact **Ross Video Technical Support** for ordering information.

- Asterisks (*) in Synergy 100 MD menu trees denote levels of association. For example, all items marked with two asterisks (**) are grouped together, all items marked with three asterisks (***) are grouped together, and so on.

Documentation Terms

The following terms are used throughout this guide:

- "**Switcher**" refers to the entire **Synergy 100 MD Live Production Engine**, consisting of its electronics frame and control panel.

- "**Frame**" and "**Electronics Frame**" both refer to the electronics chassis of the **Synergy 100 MD Live Production Engine**.

- "**Operator**" and "**User**" refer to the person who uses the **Synergy 100 MD Live Production Engine**.

- "**Control Panel**" both refer to the large multi-button control panel of the **Synergy 100 MD Live Production Engine**.

- "**SDI**" refers to Serial Digital Video, a digital video signal that is distributed via a single coaxial cable with BNC connectors.

- "**HD-SDI**" refers to High Definition Serial Digital Interface video, a component digital video signal that is distributed via a single coaxial cable with BNC connectors.

- "**Video System**" refers to the mix of interconnected digital equipment (including the edit controller, VTRs, DVEs, etc.) in which the **Synergy 100 MD Live Production Engine** is included.

- "**DVE**" refers to an internal Digital Video Effects device that uses digital signal processing to create two or three dimensional wipe effects.

- "**Storage device**" refers to the hardware used to save and recall setups, configurations and registers of the **Synergy 100 MD Live Production Engine**. Examples of storage devices are the internal hard drive and a USB Drive.

Abbreviations

The following abbreviations are used throughout the text:

Abbreviation	Definition
A-D	Analog-to-Digital
AUX	Auxiliary
BKGD	Background Transition
CG	Character Generator
D-A	Digital-to-Analog
DA	Distribution Amplifier
DDR	Digital Disk Recorder
DDR (SDRAM)	Double Data Rate
DSK	Downstream Keyer
DVE	Digital Video Effects
DVR	Digital Video Recorder
HD	High Definition
ID	Identification
MD	Multi-definition
MLE	Multi-level Effects
PGM	Program Bus
PST	Preset Bus
PST PATT	Preset Pattern
PV	Preview
RU	Rack Unit
SD	Standard Definition
TD	Technical Director
VCR	Video Cassette Recorder
VDCP	Video Disk Communications Protocol
VTR	Video Tape Recorder

Related Publications

All Synergy MD switchers come with a complete set of system documentation that includes an *Operator's Manual* and an *Engineering Manual*.

For a complete operational overview of the Synergy 100 MD product line, refer to the following publication:

- *Synergy 100 MD Operator's Manual*, Ross Part Number: 4400DR-103

Product Overview

Ross Video developed the Synergy 100 MD series for live news, live sports and live production. Because the switcher is the center of the action, it must be powerful and versatile, yet easy to operate. This operational simplicity frees operators to concentrate on the content — instead of the equipment.

The Synergy 100 MD series (our fifth generation of switchers) was designed with the direct input of video professionals experienced in news, sports, and mobile production. Key members of the Synergy 100 MD design team are part of an ongoing program where they demonstrate the product, assist with installations and provide operator training. As a result, the Synergy 100 MD line continues to advance Ross Video's traditions — power, ease of use and logical panel layouts.

Product Highlights

The following list summarizes the primary features of the Synergy 100 MD:

- **Fully Digital System** — All switchers in the series are fully digital. This unique concept simplifies the design, minimizes the power requirements, and reduces the overall cost.

  By requiring all A-D and D-A conversion to be performed *outside* the system, digital noise stays *out* of the converters. In addition, customers are guaranteed the latest converter technology, *without* burdening the cost of the switcher, and *with* the added option to use those converters for other purposes — as they gradually convert to the digital domain.

- **Multi-Definition** — The Synergy 100 MD switcher allows you to work in either Standard Definition or High Definition, supporting 480i (SD 525), 576i (SD 625), 720p, 1080i, 1080p, and 1080pSF video formats.

- **Input Matrix** — The Synergy 100 MD comes standard with 16 multi-definition video inputs.

- **Stunning Styling in 4 Color Choices** — The Synergy 100 MD is sure to impress with sleek lines, subtle design accents, and colors to match your installation. Classic Black, Tech Silver, Sport Yellow, and Cool White – the choice is yours, but it won't be easy!

- **Powerful Compact MD Frame** — The Synergy 100 MD multi-definition frame sets a new standard for small compact frame capability. The Synergy 100 MD frame has the potential for 2.5 MLEs (2 Keyers and 1 DSK), 32 Multi-Definition Inputs, 16 Multi-Definition Configurable Outputs, 8 DVE Channels, 13 Internal Keyers, 11 Internal Ethernet-connected Media Stores, and 13 Classes of External Interfaces. Add Proc Amps, RGB Color Correctors, Utility Buses, FlexiClean™, Preview Overlay, Linux OS, and a whole lot more, and the result is nothing short of revolutionary.

- **Preview Overlay** — This powerful feature provides an intuitive way to set up the extended functions of the Synergy 100 MD. A graphical overlay on the switcher preview provides plain English set up and programming menus.

- **Ethernet Connectivity** — Upgrades can be done from a computer using an Ethernet port on the back of the frame. Images and animations can be copied from a computer to the switcher's internal hard drive for use by the Global-Store and MediaCache. The Ethernet port can also be used to transfer images and animations from the hard drive on the switcher to a computer. This allows images captures on the switcher to be used elsewhere in the studio.

- **DSKs** — The Synergy 100 MD has one standard Downstream Keyer. With the MultiDSK™ option installed, two additional Downstream Keyers are added. The DSK has full access to all 16 inputs.

- **Squeeze & Tease® MD** — Squeeze & Tease MD is a high quality, powerful multi-definition 3D DVE option. Great for sophisticated looking boxes, it allows every type of Key to be squeezed or zoomed, cropped, repositioned, and rotated in 3D space. It can also perform 3D Key or Background transitions. Squeeze & Tease MD comes equipped with preprocessor effects such as defocus, mosaic, posterization, colorization, strobe, picture frame borders, and a lot more. Up to 4 channels of Squeeze & Tease MD can be added to the Synergy 100 MD.

- **Squeeze & Tease® MD WARP** — Stunning curvilinear transitions and creative effects are possible when this option, which provides warp capability to Squeeze & Tease MD, is added. Over 20 classes of modifiable WARP effects are included such as page turns, spheres, ripples, 3D hearts, stars, sandstorm, old film effects, and more.

- **UltraChrome™ Advanced Chroma Keying** — Our UltraChrome Chroma Keyer uses new Ross technology to perform detailed Keying in the most demanding applications. The UltraChrome Chroma Keyer is a standard feature of the Synergy 100 MD.

- **3 Channel Global-Store™** — Three independent channels of stills are available. Thousands of stills and logos can be stored in the on-board hard drive and are transferable to other control-room devices using the WebDAV protocol. Stills and logos are stored on the switcher hard drive, and can be transferred using drag & drop to other control-room devices via Ethernet.

- **Powerful MLE** — Synergy 100 MD packs major effects and Keying power into this small, versatile switcher. It has two fully featured Keyers with luma, linear, preset pattern, and an advanced UltraChrome chroma Keyer. Two advanced pattern generators include rotary wipes, heart, and star.

- **Serial Tally Interface** — Interfacing to Under Monitor Display and Tally Systems is easy with this option. The Serial Tally Interface uses industry standard tally protocols to communicate tally information on an RS-422 serial port to other devices.

- **Small Audio Mixer Interface** — This powerful option is available for those who wish to control an audio mixer from the Synergy 100 MD panel, making an integrated A/V production possible.

- **Compatible with Synergy SD Panels** — The Synergy MD frame connects to the same control panels as the economical Synergy SD frame.

- **Compatible with the Synergy MD-X Compact Rack Frame** — With the exception of the Input with Crosspoint board, all other boards used in the 3RU Synergy MD compact rack frame also plug into the Synergy MD-X 8 RU rack frame. This allows for consistent operation, maintenance, and spare parts across the entire product line.

- **Hot Swappable Cards** — All cards in the Synergy MD frame can be safely removed with the power on. If any card is plugged into the wrong slot, the card and system hardware will not be damaged. In addition, Synergy MD was designed to support emergency swapping of some circuit boards even during live operation.

- **GVG Compatibility** — Those who grew up on the GVG 100 or 110 will find this powerful switcher astoundingly simple to learn. Not only will your hands fall right into place, the switcher drops right into the original GVG desk cutout and consumes the same 3RU as the original frame.

- **Remote Aux Bus Panels** — Up to 8 Remote Aux Panels can be added to the Synergy 100 MD.

- **Growth Path** — The same video-processing frame is used for our Synergy MD 100, 1, 1.5, 2, and 2.5 MLE switchers. Buy a smaller system now and then add another MLE and a larger control panel as your needs grow.

- **Free Upgrades from the Web** — Software and even some hardware can be upgraded by downloading files from our web site.

- **Built to Last** — Ross Video warranties save thousands in operational costs over competitive products. It's no secret that Ross products are tough. They're built to handle years of demanding, continuous use. The Synergy 100 MD is backed by a comprehensive 3-year transferable warranty. The design of our fourth generation fader bars is so good that they are guaranteed for life.

Standard Features

The following features are standard in the Synergy 100 MD switcher:

Complete Control Panel

Regardless of what options are ordered, you will always receive a control panel with every button, knob, display, and light installed. This means that your Synergy 100 MD and your control room will look their very best - even if your budget is tight.

16 Multi-Definition Serial Digital Inputs

The Synergy 100 MD switcher comes standard with 16 serial digital inputs. Any input can be assigned to any of the 10 control panel pushbuttons - simplifying installation. In the event that the user would like the ability to access any of the 16 sources, one of the source buttons can be assigned as a "shift" button which, when held, shifts that row of sources to a second bank. Any of the inputs can be used for video or alpha channels.

16 Multi-Definition Timed Digital Outputs

| **Note** | If the MultiDSK option is enabled, BNCs **B01** to **B06** are locked and cannot be re-configured. **B07** defaults to Preview with Overlay. |

In the Synergy 100 MD, every output is configurable. Output mapping will vary greatly from one installation to another depending upon local requirements, and whether MultiDSK is installed and enabled.

The following signals are available from the crosspoint matrix to the output cards in a standard system.

Crosspoint Matrix Video Signal	*Quantity*
Black	1
Standard Primary Inputs	16
Global-Store	3
Program	1
Preview	1

Crosspoint Matrix Video Signal	Quantity
FlexiClean Clean Feed	1
Preview Overlay	1
DSK 1	1
Total sources available	**25**

Every output is fully timed to provide consistent and adjustable output phasing.

Analog Reference Input

All Synergy MD switchers use an analog reference that consists of a pair of looping reference BNC connectors, in addition to the standard 16 inputs, on the rear panel of the Video Input Board. Tri-level sync is recommended for HD applications. The same looping connector will accept standard color black as a reference in SD applications.

	Note	If the reference loop is not used, it is recommended that the loopback BNC be terminated.

3 Channel Global-Store

Three independent channels of stills are available switcher-wide. Thousands of full screen stills and logos can be stored in the on-board hard drive and are transferable to other control-room devices via Ethernet using the WebDAV protocol, which also comes standard with the Synergy 100 MD.

Global-Store comes standard with 256 Megabytes of RAM storage. This translates to at least 30 full screen 1080i images with Key or 189 full screen 480i images with Key. The number of images stored increase considerably when smaller, non-full screen images like logos are stored. Thousands of additional images can be loaded quickly from the system hard drive. When the optional MediaCache for Global-Store is enabled, the playout capabilities and storage capacity of the Global-Store are increased considerably.

One Full Multi-Definition MLE Effects System

Standard equipment on the Synergy 100 MD switcher includes one full MLE (Multi-Level Effect) system. Two wipe generators come standard. The two Effects Keyers can matte fill, Key invert, mask, Self Key, Linear Key, and Preset Pattern Key. Dual UltraChrome advanced Chroma Keyers are standard. The MLE also features five matte generators. Full preview is always available to reduce on-air surprises.

Copy and Swap Functions

The following convenient copy and swap functions are available as standard:

- **Copy Key** – allows you to copy the contents of one Keyer to another Keyer.

- **Swap Key** – allows you to swap the contents of one Keyer with another Keyer.

Two Pattern Generators

The Synergy 100 MD includes (as standard) two full functionality pattern generators equipped with extensive traditional, rotary, as well as preset pattern Keys.

Keyer Configuration

The Synergy 100 MD comes equipped with 3 Keyers - two Effects Keyers and a Downstream Keyer.

UltraChrome Advanced Chroma Keying

The Effects Keyer comes equipped with dual UltraChrome high quality Chroma Keyers produced by Ross Video.

The Ross UltraChrome™ (patent pending) uses advanced video processing technology to provide exceptional blue spill reduction and clean edges, even with difficult source material. Glass, smoke, translucent materials, and natural shadows are handled superbly. Setup is a breeze with single-touch auto chroma Keying and intuitive touch-up controls.

FlexiClean™ MLE Clean Feed Output

This feature is used for bilingual and live-to-tape productions. It provides a second "program" output that is derived from a different location than the standard program output. A frequent application is the recording of shows for later airing without "call in" phone numbers inserted.

The clean feed can come from before or between the Keyers. The diagram below illustrates the possible clean feed configurations with the **MultiDSK™** (DSK 4 and DSK 5) installed.
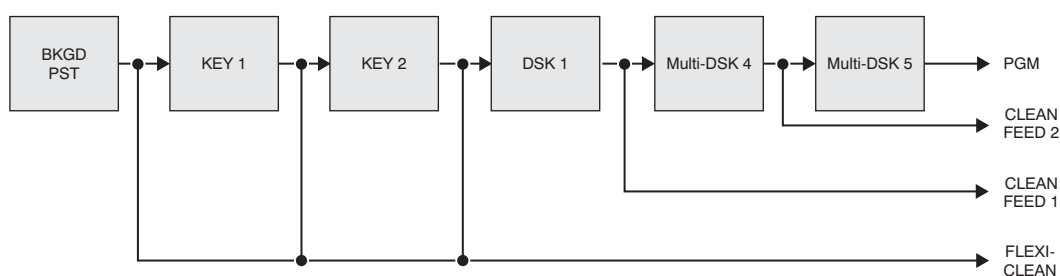
Clean Feed Modes in MultiDSK

Effects Functions (Preview Overlay)

The **Effects** function makes it possible to present various types of useful information on the two preview outputs. The overlay can be displayed according to user preferences. A variety of overlay information is available:

- The "**Safe Title and Safe Action Area**" overlay places a SMPTE standard safe title or safe action area indication over the switcher's main preview output.

    ~ Safe title is a box that outlines the area within which the vast majority of home TV sets will be able to read text.

    ~ Safe action area is a box that outlines the region within which viewers should be able to follow the action on the screen.

- The "**Center Cross Hairs**" overlay places cross hairs on the preview output to indicate the center of the picture. It is useful in the alignment of text and other information.

Powerful and Intuitive Control Panel

The Synergy 100 MD is packed with features that make it easy and enjoyable to put together a great production. Here's a quick list of product highlights:

- **Transition Preview** — This allows you to rehearse your next transition using a wipe or dissolve on the preview monitor quickly and easily before using it on air. A Ross Patent.

- **3 Axis Joystick** — This is the same high quality joystick used on all our switchers, great for positioning and sizing borders, masks, preset patterns, and more.

- **PST BLACK Button** — This button, previously only found on large production switchers, makes a quick dip to black, followed by the next preset transition, a snap.

- **Protected Fade to Black Button** — Operators frequently push buttons without looking at the panel – they're too busy watching the action on the monitors. One button they really want to have a different feel is the **Fade to Black** button. To help them out, we put special ridges around it.

- **Trans Limit Button** — Another large switcher feature, this memorizes a mid transition hold for wipes and dissolves. When activated, the appropriate segment on the transition progress bar beside the fader will flash to show exactly where in the transition the hold will occur.

- **DVE Button** — Access DVE transitions just like a wipe – press DVE, then a pattern button.

- **User Wipes** — When the next transition is a Wipe or DVE effect, double press one of the 10 pattern buttons to recall any of 10 user wipes or DVE effects, custom selected from more than a hundred possible effects.

- **Key Mem Button** — This ensures that your linear Keys are always calibrated exactly as they were designed to look. If you want to "tweak" the clip and gain, turn Key Mem off to get a custom look.

- **Char Gen 1 and Char Gen 2 Buttons** — These are your customized CG hot keys. Press either one and the DSK defaults its settings and selects the Character Generator of your choice.

- **Source Holds on Memory Recalls** — If you hold down a source button when you perform a memory recall, the memory comes back, but the background doesn't change. This is a great live feature that lets you switch a sophisticated and unpredictable production on the fly.

- **Auto DSK Drop** — The Synergy 100 MD can help you do two things at once when switching a fast paced show! When you take a new background directly to air on the background bus, the DSK can be programmed to automatically cut off at the same time.

- **Memory "Effects Dissolves"** — Memory recalls can be set to recall instantly, or to smoothly move all parameters from the current settings to the stored settings.

- **Pop Up Help** — Don't you hate it when you press a button, nothing happens, and you don't have any idea why? We do too. On the Synergy 100 MD, a short help message pops up on the preview monitor to help you out when you have pushed an invalid sequence of buttons.

- **Tri-Color Buttons** — On air sources light red, other buttons light yellow, and buttons that currently apply to the joystick and Effects Control region light green. Easy to use, easy to learn, looks great.

- **Alphanumeric Displays** — There are three assignable regions in the upper panel – Effects Control, Mattes, and System Control. Dedicated alphanumeric displays keep you well informed as to how they're assigned.

- **Non-Sync Indicators** — These are great for system timing and advance warning of potential problems with a source. The bus names to the left of the source buttons glow green when everything's okay and yellow when a source is non-sync.

- **Shared Key Bus Indicators** — The Key Bus source buttons can be shared three ways – Key 1 sources, Key 2 sources, and DSK sources. Each Keyer has its own independent bus. Illuminated labels to the left of the bus keep you fully informed.

- **Variable Button and Display Brightness** — Not all control rooms have identical lighting. The Synergy 100 MD buttons and displays can be custom set in the installation menus to just the right brightness level.

- **Built-in Panel Diagnostics** — The Synergy 100 MD panel comes complete with an easy to use suite of diagnostic tests. These are the same ones that we use to test it in our factory.

100 Event Memory System

The Synergy 100 switcher is equipped with a standard 100-event memory registers for complete switcher snapshots. At the touch of a button, the entire switcher setup can be recalled using the numbered buttons in the **Effects Control Group**, or the **10** and **1** buttons (in conjunction with the **SEL** button) in the **System Control Group**.

All of these memories, including associated attributes, can be stored to the System Hard Drive or a USB Drive, providing custom tailored memories for every operator and every show.

Effects Dissolves

All Synergy 100 MD memories can also be used as effects dissolves. This allows you to easily produce elaborate moving effects at the touch of a button.

5 Matte Generators

The Synergy 100 switcher has five simple color generators. These color generators allow you to adjust the hue, color saturation, and luminance of the BKGD, wipe pattern borders, Effects Key fill, or the Downstream Key border and matte fill.

Hard Disk Drive and USB Port

Up to 100 switcher setups, including memory functions, switcher personalities, and installation parameters, can be stored to and recalled from the System Hard Drive or a USB Port. This allows operators and technical staff to easily backup their switcher setups.

The system hard disk drive is located on the CPU Board in the Synergy MD frame. switcher settings can also be stored here for quick recall. This is the same hard disk drive that is used to store stills, logos, animated logos, and short video clips. Memories and graphics files are accessible over the 10/100 Ethernet network port for easy remote load and backup.

Switcher Setup Menus

Press the **MENU** button to bring up the setup and programming menus. These are presented in plain English and are designed for quick navigation. The menu can be over a blue background or transparent, showing the preview video behind it – this feature is user selectable.

Displays and Indicators

The Synergy 100 switcher always keeps you informed.

- **PGM** bus crosspoints are illuminated red, signifying "on-air" status, except when the panel is faded to black. In this case, the crosspoint LEDs will be orange.
- **PST** bus crosspoints are lit orange, except during a background transition, when they will be red.

- **KEY** bus crosspoints will be lit orange when the Key is not on air, and red when the Key is contributing to the program output.
- The secret-till-lit LEDs to the left of each crosspoint bus will be lit green when the source selected on the bus is synchronous, and orange if the source is non-synchronous.
- Functions that have control of the **Effects Control** groups will be lit green (e.g. **FLY KEY**).
- The **ON AIR** secret-till-lit LEDs in the **Effects Keyers** group and under the Key and DSK transition buttons in the **Transition Control** group glow red when the Key is on air.
- The **EDIT** secret-till-lit LED under the **MENU** button in the **System Control** group is lit when the **Editor** option is installed and enabled.
- The auto transition rate in the **System Control** group is constantly visible.
- When the switcher is in "memory mode", the last memory register accessed is displayed in the **System Control** group.
- The four-character **MODE** displays in the **Effects Control**, **Mattes**, and **System Control** groups, always inform you of which function has control of each group.
- The LEDs in the **Transition Progress Bar** show you how far the transition has progressed, and which direction the fader must travel to complete it.

General Purpose Interface

The Synergy 100 MD is equipped with ten dedicated GPI inputs. Each GPI input can be used to perform simple editing and switcher functions such as fade to black, an auto transition, and a memory recall.

Note
GPI outputs are not implemented as this time.

Control Panel Tallies

Sixteen tallies come standard with the Synergy 100 MD control panel.

10 Meter Control Cable

The Synergy 100 MD control panel and rack frame are connected by a single, standard 8-pin flat-shielded Telco cable that uses RS-422 communication. The maximum cable length between the control panel and its rack frame is 1,000 feet or 305 meters.

Synergy Slots

The Synergy 100 MD incorporates a special mode in which pseudo-random information is statistically measured on a cumulative basis.

System Options

This section lists the options available for the Synergy 100 MD. All options can be easily installed in the field.

Note
Refer to the section "**Installed Options**" on page 6-31 for instructions on how to verify the status of your installed hardware options.

Conversion Frames

All switcher inputs and outputs are 10-bit SDI, including the system reference. Signal sources of other video formats must be converted to serial digital. Ross Video chose to do this conversion externally to ensure that the very latest conversion technology and most competitive pricing is available to our customers. An added bonus of external conversion is the ability to use those converters elsewhere in your facility as you eventually upgrade your switcher sources to serial digital. The following table lists the Ross Video products that qualify as converters.

Converter	Description
ADC-8032B	Analog Composite to SDI Digital Decoder
ADC-8032B-S	Analog Composite to SDI Digital Decoder with Frame Sync
ADC-8033	Analog Component to SDI Converter
ADC-8035	Dual Analog Composite to SDI Converter
CMA-8011A	SDI Component Monitoring Amplifier
CMA-8011A-7	SDI Component Monitoring Amplifier with 7 reclocked SDI Outputs
DAC-8013	SDI to Analog Component Converter
DAC-8016A	SDI to Analog Composite Converter
DAC-8016A-S	SDI to Analog Composite Converter with Frame Sync
DAC-8016A-SX	SDI to Analog Composite Converter with Frame Sync and X-Color Filter
DAC-8016A-X	SDI to Analog Composite Converter with X-Color Filter
QMA-8044	Quad SDI to Analog Composite Monitoring Amplifier
UMA-8017	Universal SDI Monitoring Amplifier

Please visit our website or contact your Ross Video representative to obtain a current Ross Video Product Catalog for detailed information on our complete line of converters.

MediaCache for Global-Store

MediaCache™ for Global-Store™ enables the playout of animated logos, moving graphics, and short uncompressed clips from the Global-Store. Each output is capable of playing full bandwidth clips independently and simultaneously.

The duration of the clips depend upon the size of the clips being used. Full screen 1080i images will take 5 times the storage of a 480i clip. However, a small, animated logo in 1080i will take much less storage than a full screen 480i clip. Purchase of MediaCache for Global-Store increases the RAM capacity from 256MB to 1GB. This allows storage of up to 4 seconds of uncompressed 1080i playout or 25 Seconds of 480i playout.

Clips and animations are loaded from the system hard drive to local Still Store RAM at power-up, or when new clips are requested. Clips are transferred from external computers to the Synergy 100 MD switcher via Ethernet.

Squeeze & Tease MD Carrier

This is an optional carrier card equipped with a high performance DSP (Digital Signal Processing) module. One of these cards must be purchased in order to install the Squeeze & Tease MD or Squeeze & Tease MD WARP option cards.

Squeeze & Tease MD

One Squeeze & Tease MD option provides two channels of 3D planar effects. The Synergy 100 MD can have up to two of these options, providing an impressive 4 channels of 3D DVE.

> **Note** | The Squeeze & Tease MD can only be installed on the Squeeze & Tease MD Carrier board.

The following are some of the functions you will be able with the Squeeze & Tease MD option:

Fly ANY kind of Key

Pressing the **FLY KEY** button easily activates Squeeze & Tease MD allowing you to transform self Keys, linear Keys, and chroma Keys. A comprehensive and intuitive menu is available where you can set up your desired effects. If you prefer, the 3-axis joystick can also be used to adjust your Key's parameters.

Preprocessor Effects

Preprocessor effects include wide range defocus with separate H and V controls, mosaic, posterization, colorization, and a strobe effect that allows you to vary the number of on and off frames to provide enhanced creative possibilities. All preprocessor effects are available to be combined simultaneously.

Lighting

All images and Keys can also have realistic natural lighting applied to them. Squeeze & Tease MD makes it easy with "quick presets", a positionable light source, and powerful ambient and min/max lighting controls.

Advanced Picture Frame Border Generator

Squeeze & Tease MD can add a picture frame to border over-the-shoulder boxes. This variable width border perfectly tracks all image resizing and special effects. The picture frame generator instantly adds a polished, professional look to your squeeze backs.

This picture frame can be the simple, single color type, or one of many picture frame effects including roman column, tubular, beveled, computer style, tri-color, and more. These picture frame effects have the following adjustable controls:

- hard or variable edge softness
- edge width/scaling
- inside/outside edge softness symmetry
- diagonal, horizontal, and vertical corner joint selection
- full control of all three picture frame color generators.

Advanced Planar Controls

The following advanced controls make building the ideal look for your show just that much easier:

- **Front Side/Back Side** — When you look at the backside of an effect, you can have it automatically select a different video signal on the Key bus. This makes it possible, for example, to rotate between 2 channels of still store in an over-the-shoulder box in a single Keyer, using only 1 channel of S&T MD.

- **Auto Flip** — When you rotate an image in normal mode, the backside appears upside down or mirrored. Turning on Auto Flip ensures that the front side of an image is always presented. This is great for the manipulation of still store and CG text.

- **Internal Key Combiner** — Squeeze backs can be combined and displayed in a single Keyer. This effectively adds additional Keyers to the Synergy MLE.

- **Key Combiner Priority Control** — Getting the channels the way you want them is easy with S&T MD. When several squeeze backs are combined in a single Keyer, you can choose fixed priorities, auto-priority, or intersecting planes. Auto-priority automatically calculates the channel priority based on their relative positions in 3D space. With the intersecting planes choice, channels will literally cut into one another channel hiding the portions that are hidden behind them.

Pre-Built Effects, User-Built Timelines, and Key Sequences

Squeeze & Tease MD ships with dozens of prebuilt effects that are ready to take to air. More effects can be downloaded from our website. All of these effects can be easily user modified to meet your needs. You can also build entirely new effects of your own from scratch.

Effects can be built to start when a macro button is pressed, when an auto transition is pressed, or can be run under manual fader control. Effects can be used as a transition, or as a sequence of Keyframes running inside one or more Keyers.

Squeeze & Tease MD WARP

Squeeze & Tease MD WARP adds extensive curvilinear effects to an MLE with Squeeze & Tease MD installed. These effects can be applied to transitions or Keys where a planar channel or Key-combined group of channels is being used.

Note The Synergy 100 MD Switcher will support only one Squeeze & Tease WARP option.

WARP Effects

WARP effects include such ones as page turn, ripple, wave, mirror, melt, lenses and many more.

The creative possibilities are endless as S&T MD WARP effects can be easily combined with preprocessor, planar transformation, lighting and picture frame effects.

Assignable Remote Aux Panels

A **Remote Aux Panel** is a self-contained switching unit that has its own power supply. It mounts in a 19-inch rack and fills one RU (Rack Unit).

An **Assignable Remote Aux Panel** controls multiple Aux Bus outputs.
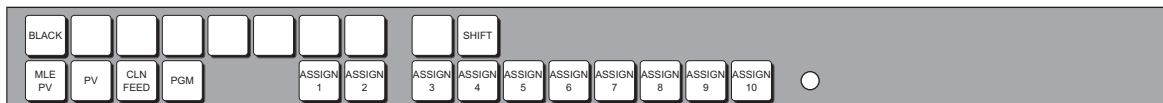
Synergy 100 MD Remote Aux Panel

Note You can control up to 10 Aux Buses from a Remote Aux Panel.

The Remote Aux Panels include dedicated buttons for Preview, Program, Clean Feed, and for accessing multiple Aux Bus Outputs — plus a bright "on-air" LED.

The following features will affect the positioning of Remote Aux Panels in relation to the control panel:

- The **Assignable** Aux Panel options include a 33-foot (10 meter) cable, but custom lengths, up to a maximum of 1000 feet or 305 meters (as limited by RS-422 specifications), between panels is possible. Contact Ross Video for details.

- The communications signal is re-buffered at each Remote Aux Panel.

- Remote Aux Panel assignments are performed using the control panel and menu system. Refer to the section "**Remote Aux Panel Overview**" on page 10-2 for more information.

MultiDSK (DSK 4 and DSK 5)

This option adds a second and a third linear Downstream Keyer to the standard internal DSK. These Downstream Keyers have access to every video source, and are fully integrated into the transition system with full preview.

The hardware for this option resides on the Video Output Board, and will consume six Output BNCs to supply the DSKs with Video and Key sources.

Editor and Automation Interface

It is common to use an editor to control a video production switcher in linear editing and packaging applications. With the editor interface option, the Synergy 100 MD can interface to all popular editing systems. Any area of the switcher can be controlled using an RS-232 or RS-422 interface and industry-standard GVG 100, 200, or 4000 editor protocol. The editor can be used to read and write switcher functions including video input selection, pushbutton enable and disable, control settings, and memory registers. If complete control of all switcher parameters from an editor or remote device is necessary, this option is required.

Note | An alternative to the serial interface is GPI triggers, which come standard with the Synergy 100 MD. GPIs can be programmed to press cut or auto transition buttons directly.

Small Audio Mixer Interface

This option enables serial control for enhanced audio-follow-video from the Synergy 100 MD switcher over small audio mixers, allowing integrated A/V production possible.

You can purchase the small but powerful Yamaha 01V96 audio mixer console through any Ross Video distributor. This mixer has up to 16 analog inputs, 16 digital inputs, and a proven interface to our production switchers.

Note | On the Synergy 100 MD switcher, this is a simple audio-follow-video interface. Larger Synergy MD/MD-X models offer a more comprehensive interface.

Serial Tally Interface

This option enables Serial Tally Interface using industry standard protocols to Under Monitor Display and Tally Systems. The standard parallel tally interface will continue to operate normally when this option is enabled.

Control Panel Redundant Power

This provides a spare "quick swap" power supply for the Synergy 100 MD control panel. The control panel power supply consists of a custom external "brick" which includes a locking connector. It can be easily changed in a few seconds.

Frame Redundant Power

This option provides redundant power for those who have replaced or upgraded their frame and already have redundant power for their panel.

Spare Parts Kit

A **Spare Parts Kit** is available which provides switcher parts according to the following criteria:

- the part comes into frequent contact with the user

- the part can be easily damaged or may wear out with excessive use

- the part can be damaged by connecting excessive voltage to an external connector

- the part is used in system power management

- the part can be lost easily

Custom Cable for Main Control Panel

The **Control Panel** cable connects the control panel to the electronics frame. It is a shielded 8-pin RJ-45, CAT5 cable. The control panel and frame can be separated by a maximum of 300 meters.

A 10 meter control panel cable is supplied as standard with the switcher. If cable lengths other than 10 meters are needed, a custom cable can be ordered (by the meter).

A Word about 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 personnel. During business hours (eastern standard time), technical support personnel are available by telephone any time. After hours and on weekends, a direct emergency technical support phone line is available. If the technical support personnel who is on call does not answer this line immediately, a voice message can be left and the call will be returned shortly. These people are available to react to any problem and to do whatever is necessary to ensure customer satisfaction.

For **Technical Support**, call (+1) 613-652-4886 and, for **After Hours Emergency**, dial (+1) 613-349-0006.

Product Comparison Charts

As a comparison, the following tables detail the features and options that are available with the different Synergy MD switchers.

Feature	100 MD	1 MD	1.5 MD	2 MD	2.5 MD
Number of MLEs	1	1	2	2	3
Number of MLE Keyers	2	2	2*	2	4*
Input BNCs	16	16 (+16)	16 (+16)	16 (+16)	16 (+16)
Output BNCs	16	16	16	16	16
Panel Accessible Inputs	16	30	32	32	32
UltraChrome Chroma Keying	Yes	Yes	MLE 1	MLE 1 and 2	MLE 1 and 2
Custom Control Buttons	None	24	17	17	30
Programmable Custom Controls	None	128	72	72	176
Number of MLE Keyers	2	2	2	2	4
Number of DSKs	1 (+2)	(+2)†	2 (+2)*	2 (+2)	2 (+2)*
DSK Self Keys	Yes	--	Yes	Yes	Yes
DSK PST PATT Keys	No	--	No	Yes	No
DSK Auto Select Key	Yes	--	Yes	Yes	Yes
DSK Chroma Key	No	--	No	Yes	No
Button Accessible Aux Buses on Control Panel	10	2	32	32	32
Mnemonics Available	No	No	Yes	Yes	Yes
Control Panel Tallies	16	16	36 (+36)	36 (+36)	36 (+36)

Numbers in ( ) represent optional upgrades that are available.

* There is reduced functionality on the Keyers of the Half MLE.

† The **Synergy 1 MD** does not have Downstream Keyers as standard. The MultiDSK option must be installed in order to use the Downstream Keys.

System Architecture

In This Chapter

This chapter describes the layout of the boards in the frame of the Synergy 100 MD switcher, the overall system block diagram, and provides an explanation of how video flows through the unit. The following topics are discussed:

- Block Diagram
- Front Synergy 100 MD Frame Layout
- Rear Synergy 100 MD Frame Layout
- System Boards
- Buses and Video Routing
- Crosspoint Matrix
- Video Processor
- Squeeze & Tease MD
- Aux Buses
- Reference and PLL
- Video Formats
- CPU Structure
- A Note About CPU Architecture
- Board Labeling

Refer to the section "**Equipment Overview**" on page 3-4 for a detailed discussion of the frame front panel, back panel connectors, internal board layout, and control panel connectors.

Block Diagram

Use the block diagrams below for reference throughout this chapter.
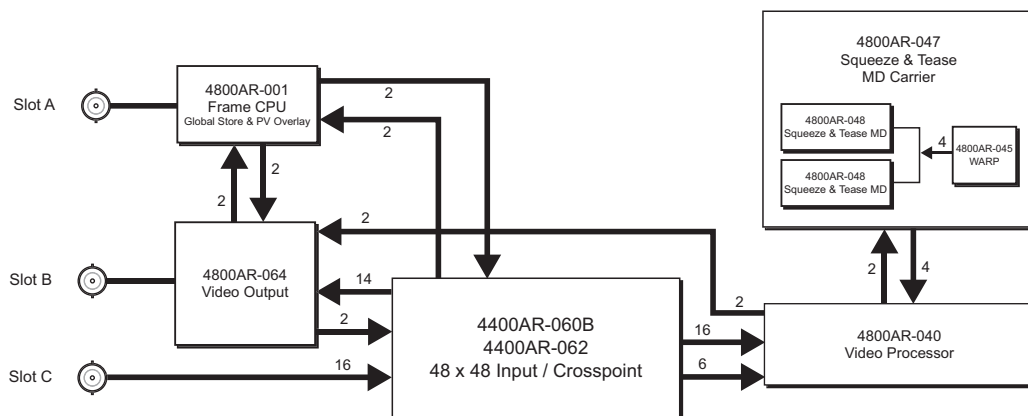
Synergy 100 MD Block Diagram — 48 x 48 Crosspoint

Note the following important points regarding the previous diagram:

- 16 external inputs are routed into one 16-input Video Input Board (400AR-062).

- The 4400AR-062 Video Input Board has a 72 x 72 crosspoint matrix but functions as a 48 x 48 crosspoint matrix.

- The following signals are available from the crosspoint matrix to the Video Output Boards:

  ~ up to 16 primary inputs

  ~ 3 Global-Store (and optional MediaCache)

  ~ 1 MLE PGM

  ~ 1 MLE PV

  ~ 1 Preview Overlay ("Preview Matrix")

  ~ signals generated by the optional MultiDSK's DSK4 and DSK5

- Video is routed from board to board through the midplane.

- Most video connects via a central 48 x 48 crosspoint switch.

- All outputs are routed from the central crosspoint, and therefore, are fully configurable to be program, preview, clean feed, or Aux Bus outputs. These are routed to the output BNC connectors through a 16-output board (4800AR-064).

- All outputs include a line synchronizer, making them "timed" outputs.

> ✎ **Note** The following sections provide diagrams of the front and rear frame of the Synergy 100 MD switcher. Refer to the section "**Equipment Overview**" on page 3-4 for more detailed descriptions of the components listed in the diagrams.

Synergy MD Frame Layouts

This section includes a graphical overview of the Synergy MD Frame. Descriptions of the boards and cards can be found in the section, "**System Boards**" on page 2-4.

Front Synergy 100 MD Frame Layout

The figures on the following pages illustrates the location of each main circuit board in the Synergy 100 MD frame. The figure below illustrates the front of the frame, with the doors removed.
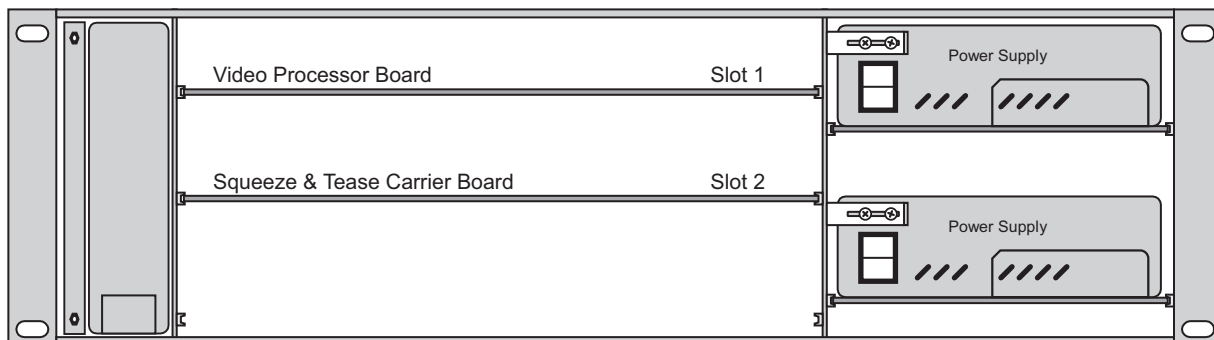
Synergy 100 MD Frame — Front View

Rear Synergy 100 MD Frame Layout

The figure below illustrates the rear connector panel of the electronics frame.

⚠	**Important**	The Frame CPU Board must be installed in Slot A.
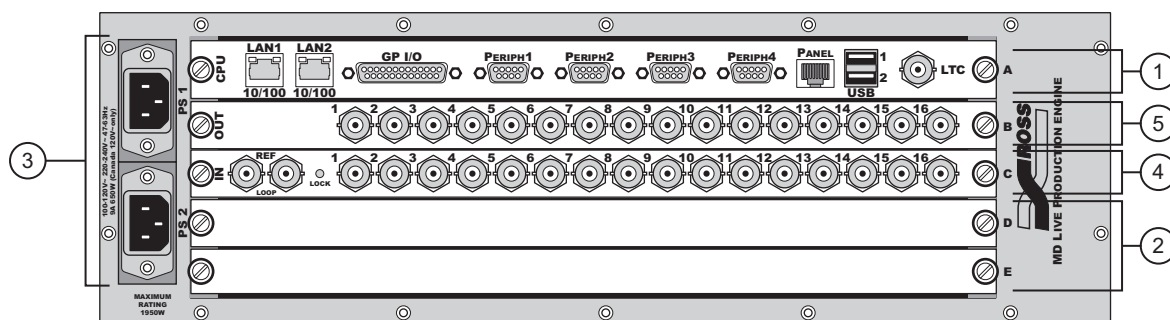
Synergy 100 MD Frame — Rear View

1) Frame CPU Board	3) Power Connectors	5) Output Board
2) Future Expansion	4) Input Board	

System Boards

This section includes brief descriptions of the System Boards available for the Synergy MD frame. These boards are referred to throughout this chapter.

Frame CPU Board (4800AR-001)

The **CPU Board** resides in **Slot A** at the rear of the frame, and is connected to the midplane. It contains the Hard Disk, the system memory, and the main system microprocessor, and is responsible for the high-level control functions and all Ethernet and remote serial communication for the frame and between the frame and control panel.

Output Board (4800AR-064)

The Synergy 100 MD frame supports one **Output Board**, in **Slot B** on the rear of the frame. This board contains 16 fully configurable multi-definition video outputs that can be used as Aux Buses, MLE Program, MLE Preview, MLE Clean Feed, Preview Overlay, External DVE Send, or MultiDSK.

Input/Crosspoint Board (4400AR-060B, 4400AR-062)

The **Input/Crosspoint Board** comes in the following configurations:

- a 48 x 48 crosspoint matrix with an analog reference loop (**4400AR-060B**), and

- a 72 x 72 crosspoint matrix with an analog reference loop (**4400AR-062**).

All versions of the boards have a total of 16 video inputs, and 2 additional BNC inputs for the reference connections. Inputs are configured and assigned through the menu system.

Important | The **4400AR-062** input board with 72 x 72 crosspoint is only compatible with the **4400AR-019** midplane.

Video Processor Board (4800AR-040)

The **Video Processor Board** performs all of the basic video effects in the Synergy 100 MD switcher. Functions such as the interface to the Chroma Keying, patterns and wipes, and transitions are all generated on this card.The Video Processor Board includes two slots to support future hardware options.

Midplane (4400AR-010, 4400AR-019)

The **Midplane** is a non-removable board that provides the interconnects between the system frame boards, the power supplies, and the fan assembly, as well as the routing through which all video signals, communication, and control commands pass. The board has no active components. Refer to the section "**Frame Board Overview**" on page 14-2 for more information on these primary system boards.

Squeeze & Tease Carrier Board (4800AR-047)

The **Squeeze & Tease Carrier Board** provides four slots for the Squeeze & Tease MD Cards and two slots for the Squeeze & Tease WARP MD Cards. The board also provides local control as well as video routing and power to these cards. Refer to the section "**Squeeze & Tease MD Option**" on page 16-13 for more information on installing the Squeeze & Tease MD option. Refer to the section "**Frame Board Overview**" on page 14-2 for more information on the system boards.

Squeeze & Tease MD Card (4800AR-048)

The Squeeze & Tease MD Card performs all the Squeeze & Tease video manipulation for the system. It provides all the planar processing, pre-processing, lighting, bordering and filtering. Each card supports up to 10 high-speed digital channels for SDI or HD-SDI video signals. Two of these channels are routed to the rest of the frame, two are routed to the previous Squeeze & tease MD Cards, two are routed to the next Squeeze & Tease MD Cards and another two are routed to the optional Squeeze & Tease MD WARP Cards. These channels are synchronized using a single-ended V-Sync signal.

Squeeze & Tease MD WARP Card (4800AR-045)

The Squeeze & Tease MD WARP Card performs all the 3D WARP effects for the system. There are two high-speed digital channels for SDI or HD-SDI video between the WARP card and the Squeeze & Tease MD card.

Buses and Video Routing

The Synergy 100 MD switcher's full crosspoint matrix is 48 x 48. Each input is routed through the **Midplane** (4400AR-010 or 4400AR-019) to the **Input Board** (4400AR-060B or 4400AR-062), which in turn distributes them throughout the system. The crosspoint matrix on the Input Board, in effect, functions as a 48 x 48 routing switcher. Any input can be routed to one or *all* of the outputs.

⚠	**Important**	The **4400AR-062** input board with 72 x 72 crosspoint is only compatible with the **4400AR-019** midplane.

Crosspoint Matrix

The following diagrams provide a closer look at the crosspoint matrix.
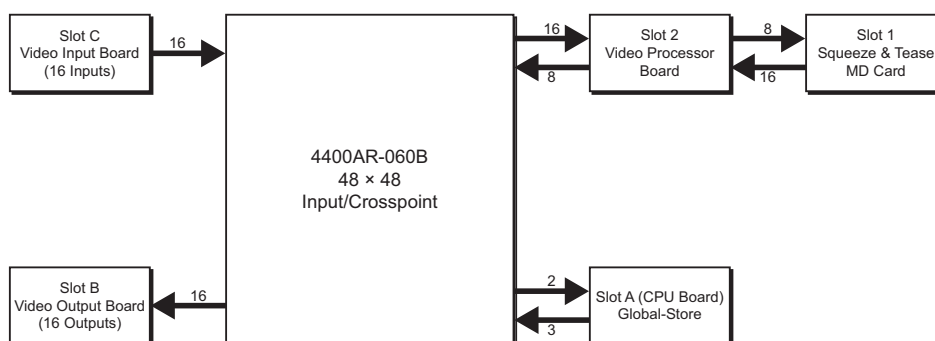
Video Flow Through 48 x 48 Crosspoint Matrix

✎	**Note**	The 4400AR-062 has the same inputs and outputs as the 4400AR-060B.

Inputs to the Crosspoint Matrix are as follows:

- 16 external inputs (16 x 1 Input Board in **Slot C**)

- 8 from the Video Processor board

- 3 from the Global-Store

- 4 are reserved for future expansion

Output buses from the Crosspoint Matrix are as follows:

- 16 to the Video Processor board

- 16 external outputs (16 x 1 Output Board in **Slot B**)

- 3 to the Global-Store

- 14 are reserved for future expansion

Video Processor

Inputs are routed from the crosspoint matrix to the **Video Processor Board** (4800AR-040) where all of the basic video effects are performed. The following diagram provides a closer look at the video path through the Video Processor.
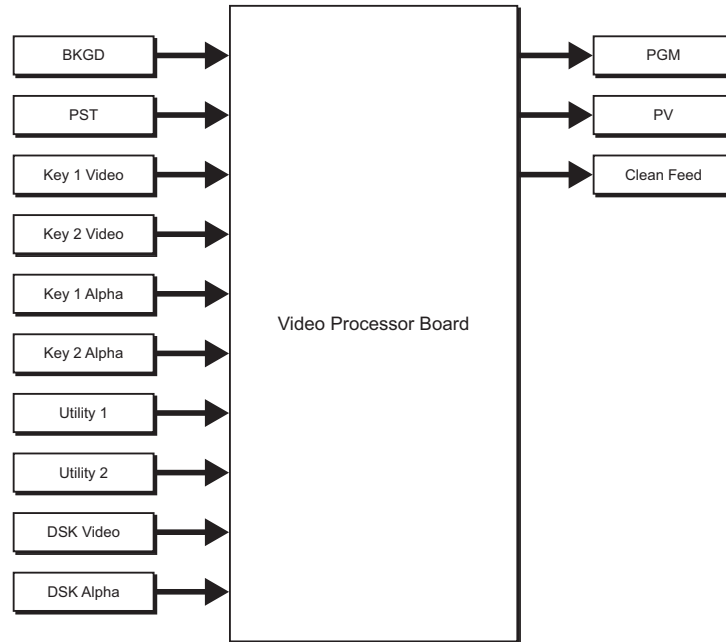
Video Flow Through Video Processor

Inputs to the Video Processor are as follows:

- BKGD
- PST
- Key 1 Video
- Key 1 Alpha
- Key 2 Video
- Key 2 Alpha
- Utility 1
- Utility 2
- DSK Video
- DSK Alpha

Outputs from the Video Processor are as follows:

- PGM
- PV
- Clean Feed

Squeeze & Tease MD

If you have Squeeze & Tease MD installed in your switcher, video signals are routed from the Video Processor board to the Squeeze & Tease Carrier and daughter boards, where they are manipulated, and then fed back to the Video Processor. Refer to the following diagram for details.
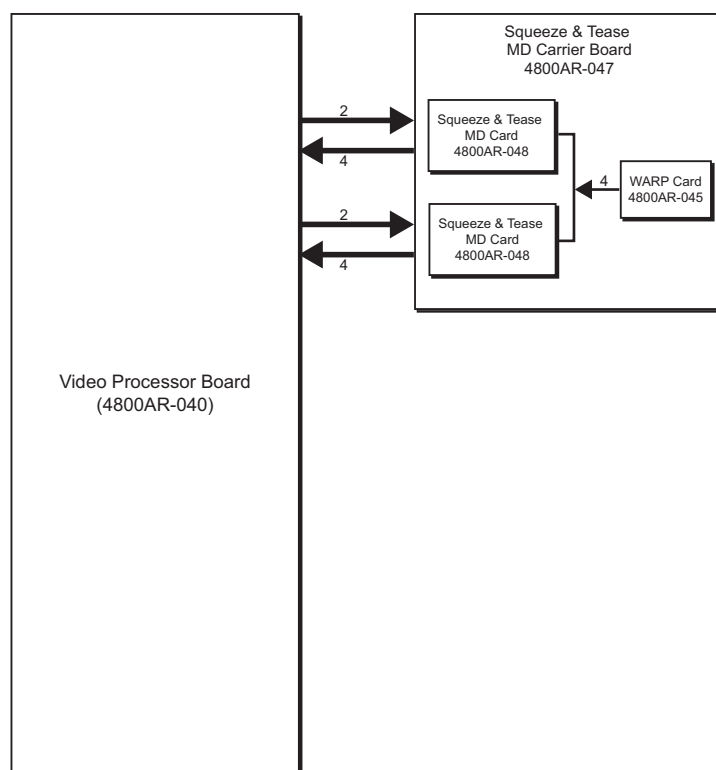
Video Flow Through Squeeze & Tease MD

Inputs are as follows:

- 4 inputs (can be either video or alpha)

Outputs are as follows:

- 4 alpha out
- 4 video out

Aux Buses

Synergy 100 MD has a total of 10 "timed" Aux Buses, with each having access to all 16 possible inputs of the crosspoint matrix. Outputs for each reside on the **Output Board** (4800AR-064), and are configured through the menu system. Refer to the section "**Configuring the Outputs**" on page 8-4 for more information.

| Note | As the Synergy 100 MD only supports 16 outputs, only 16 Aux Buses are accessible at a time. |

Reference and PLL

The Synergy MD switcher uses a distributed clocking strategy. This means that each board that processes video generates its own clock source, ensuring high-quality, low-jitter timing within the system. A pair of oscillators are used on each module to ensure optimal performance in each video mode: 148.5MHz is used for 1080i/60, 720p/60, 480i/59.94 and 576i/50; 148.352MHz is used for 1080i/59.94 and 720p/59.94. Each board's clock generator is locked to a master reference.

✎ **Note** | The internal reference signals are bused, so that the input reference may be sourced from any input card slot.

On the Video Input Board with Reference (4400AR-060B) there is an analog Reference input, consisting of a pair of BNCs which can be looped. This input can accept Composite/Black Burst or Tri-Level Sync. For optimal performance, it is recommended that tri-level sync be used for HD video modes. Refer to the section "**Compatible Video Formats**" on page 11-10 for more information on compatible video formats.

The reference processor includes a PLL (Phase-locked Loop) which locks the internal clock source to the incoming video reference. This clock source is then used to generate master vertical sync and clock reference signals which are passed on to the rest of the system. When the PLL acquires lock with the applied reference signal, the green "Lock" indicator on the rear panel, beside the reference BNCs will illuminate.
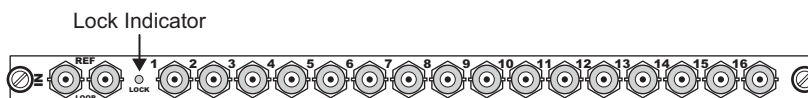
Lock Indicator — Input Board

✎ **Note** | If the analog reference signal is removed, the system will continue to run nominally at the desired video rate, but may drift out of phase with the original analog reference source. The system will re-lock if the reference source is re-applied.

It is possible for the system to run in a format which differs from the format of the incoming analog video reference. It is, however, necessary for the analog reference format and the video format in the switcher to be frame locked. For example, it is possible to provide a reference at 1080i/59.94, and run the switcher at 720p/59.94 or 480i/59.94; but it would not be possible to run the video at 1080i/60.

✎ **Note** | You can only use a 720p reference if the switcher is operating in 720p. The standard 720p reference signal does not include the field information required for referencing interlaced video. Refer to the section "**Video Formats**" on page 2-10 for more information.

Video Formats

The Synergy 100 MD switcher can operate in a number of different video formats, at different frequencies in either interlaced or progressive scan mode. When you switch between these formats, various displays and settings automatically change to show the new information. To better understand what is being displayed, you must first understand what the information for the different video formats means.

The video formats that are displayed on the Synergy 100 MD switcher provide three pieces of information about the video format. This information is the number of horizontal Scan Lines, whether the scan lines are Interlaced (i) or Progressive (p), and the Frequency that the scan lines are drawn at.
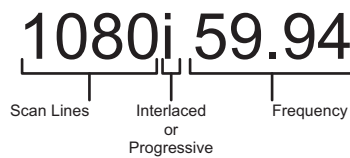
Horizontal Scan Lines

The number of horizontal scan lines is related to the pixel resolution of the image on screen. For example, if you have a 720p 59.94 video signal, the 720 is the number of vertical scan lines. A video signal with 720 scan lines usually corresponds to a 1280×720 (H×V) pixel image. This means that the image is comprised of 1280 columns of pixels and 720 rows of pixels. The reason the vertical resolution, the 720, is used to denote the video format is because of how it is drawn on a standard television. With Cathode-Ray Tube (CRT) television monitors, the image is created, or drawn, one pixel at a time, in rows, from the left side of the screen to the right, to create one scan line.
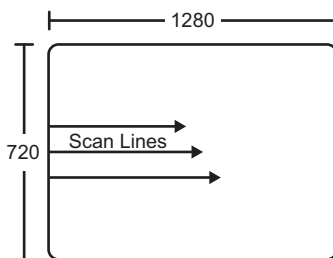
Scan Lines Example — 1280×720

Since each scan line starts from a vertical pixel, there are 720 rows of pixels, or scan lines, being drawn horizontally. The same is true of a video signal with 1080 vertical scan lines, which corresponds to a 1920×1080 pixel image.

Interlaced vs. Progressive

In the previous section we learned that a video signal is made up of a number of horizontal scan lines that are drawn from left to right on the screen. Although these scan lines are always drawn from left to right, they can be drawn in either an Interlaced or Progressive pattern.

Interlaced

An Interlaced video format starts at the top of the screen and draws all the odd number scan lines and then all the even number scan lines in sequence. This results in half the image being drawn in one pass

and the other half of the image being drawn in the second. These two passes are called Fields, where the first pass is called **Field 1** and the second pass is called **Field 2**. When both **Field 1** and **Field 2** have been drawn, resulting in a complete image, you have a single **Frame**.
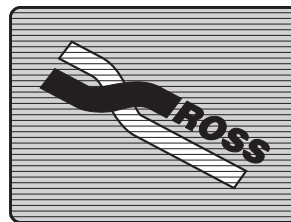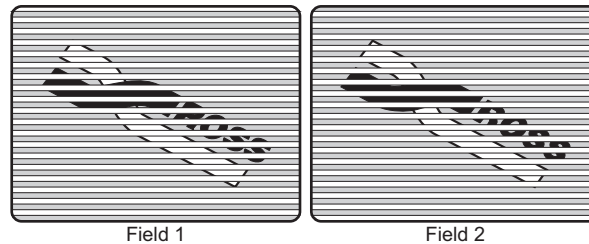
Field 1   Field 2

Interlaced
Frame 1 (Field 1 + Field 2)

Both **Field 1** and **Field 2** must be drawn to create **Frame 1**. If you are using field or frame numbers as a counter, you should remember that you must double the number if you are converting from **Frames** to **Fields**. For example, a **4 Frame** delay is equal to an **8 Field** delay.

Progressive

A Progressive scan video format draws each scan line in sequence, starting from the top of the screen and working to the bottom. Unlike Interlaced, with Progressive scan the entire image is drawn at one time, in a single pass. This means that there are no fields in a Progressive scan image.

Progressive
Frame 1

Because there are no fields in a Progressive scan video signal, you cannot use it as a reference signal for an Interlaced video signal. Because the Interlaced video format requires information about when each field is being drawn, you must use a Progressive scan video format as reference for a Progressive scan video signal.

Progressive Segmented Frame

A Progressive Segmented Frame video is similar to a Progressive scan video format in that both draw each scan line in sequence, starting from the top of the screen and working to the bottom. Unlike Progressive, Progressive Segmented Frame transmits the video signal as if it were an interlaced image: first the odd scanlines are transmitted and then the even scanlines. The even scanlines are delayed for one "field" on the transmitting end and the odd scanlines are delayed one "field" on the

Field 1 receiving end. This allows transmission of Progressive images via equipment that was designed to handle interlaced images only.

Because there are no true fields in a Progressive Segmented Frame video signal, you cannot use it as a reference signal for an Interlaced video signal.

Frequency

In the previous sections we learned that a video image is comprised of a number of horizontal scan lines that are drawn in either a progressive or interlaced format. The length of time it takes to draw the scan lines from the top of the screen to the bottom in a single pass is called the frequency, and is measured in Hertz (Hz). With a Progressive scan video format this will be the time it takes to draw the entire image. With an Interlaced video format this will be the time it takes to draw 1 field, or half, of the image.

Interlaced
Field 1
(1/50 sec at 50 Hz)

Progressive
Frame 1
(1/50 sec at 50 Hz)
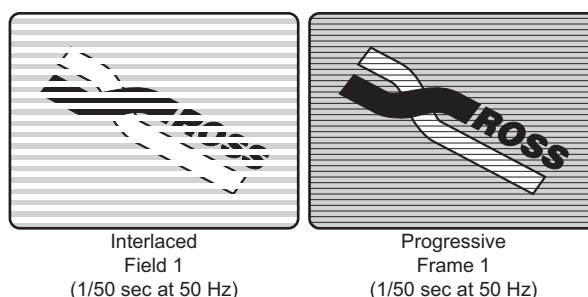
For example, an interlaced format of **1080i 50 Hz** draws **50** *fields* per second. Compare this to a progressive scan format of **720p 50 Hz** which draws **50** *frames* per second. Notice that the interlaced format is actually only drawing **25** frames (**Field 1** plus **Field 2**) per second, where the progressive scan format is drawing the full **50** frames per second.

Using Frame and Field Information

Frame and Field rates become very important when you are setting up custom control pauses, transition rates or any other system that counts a period of time in frame or fields on the switcher. Remember from the previous section that in a progressive scan format, running at **50** Hz, the switcher will draw **50** frames per second. In an interlaced format, also running at **50** Hz, the switcher will draw **25** frames per second.

The Synergy 100 MD switcher uses Frames to measure transition rates and custom control pauses. The amount of time that this represents will depend on the frequency and format you are operating the switcher in. For example, if you are operating the switcher in **1080i 59.94 Hz**, the default MLE transition rate is set at **15 Frames**. Since the frequency for an interlaced format is shown in fields, you must divide this number by **2** in order to get the number of Frames per second, **30**. By comparing the transition rate (**15** frames) and the video format frame frequency (**30** frame per second) you can calculate that the transition rate is **½** a second.

If you were operating the switcher in **720p 59.94 Hz**, the default MLE rate is set at **30 Frames**. Since the frequency for a progressive scan format is shown in frames, no conversion is required. By comparing the transition rate (**30** frames) and the video format frame frequency (**60** frames per second) you can calculate that the transition rate is **½** a second.

⚠	**Important**	When you switch reference formats, you must perform a soft reset in order to load the default rates for the format you have set.

CPU Structure

This section describes the Synergy 100 MD's CPU structure, in terms of which areas are controlled by which specific microprocessors. Effectively, the CPU structure functions as a master/slave multi-processor system, where the master processor controls high level functionality, and delegates other tasks to slave processors.

Processor distribution and functionality is as follows:

- One "PowerPC 440GX" on the **Frame CPU Board** is responsible for performing high level functions, and issuing commands to the remaining microprocessors. This processor manages all serial channels to and from the frame, manages communications with the control panel, and manages communications with all other peripheral devices connected to the frame.

  The Frame Processor also controls non-MLE functions, including all **Aux Bus** functions and all crosspoint switching on the **Crosspoint** module. It does *not* control the **Preview Overlay** module, but it *does* issue commands to that module, in terms of what text and graphics to display.

- One "PowerPC 440GX" on the **Video Processor Board** processes high-level information from the Frame CPU board that pertains to the current state and specific commands issued on the MLE.

  This high level information includes which functions are enabled or disabled, and what configurations have been set up by the user on the control panel. The Video Processor board translates that information, and sets the required bits in the hardware to complete the command request.

  Following are several examples:

  ~ If you press **WIPE** in the MLE and select the circle wipe in the **Pattern Control Group**, that information goes to the Frame CPU — which in turn tells the selected Video Processor that a circle wipe has been requested. The Video Processor then draws the proper tables required to make the image.

  ~ If you pull the **Fader** from Program to Preset, the Frame Processor receives that information and analyses how it affects the high level structures within the switcher — e.g., which buses are moving, what type of effect has been requested (Dissolve, Wipe, DVE Send, etc.). The Frame Processor then passes the current state of a particular field to the MLE Processor, which then writes the effect's specific values to the video processing circuitry.

  ~ If you press the **AUTO TRANS** button, that command goes from the control panel to the Frame Processor, which in turn keeps track of which state the transition is in. Commands are then issued to the MLE Processor to perform the transition at (for example) 4% in one field, 8% in the next field — until complete. The MLE Processor in turn *does not* process the video itself, but rather issues commands to the hardware on the Video Processor Board to set the mixer to the requested ratio and manipulate the pixels accordingly.

- One "PowerPC 405EP" on the **Output Board** is used for local control of this card. It also provides internal ethernet access, program store, and still store images.

- One "PowerPC 405EP" on the **Squeeze & Tease MD Carrier Board** governs the on-board communication and control, as well as the communication with the midplane and the daughter cards mounted on the board.

  The Squeeze & Tease MD Carrier board also contains 1 TI TMS320C6414, which performs all the mathematical calculations required for the DVE effects.

- One "Control Panel Processor" (within the **control panel** itself) simply turns LEDs on and off, and writes to the various displays on the panel. However, the Frame Processor instructs the Control Panel Processor *which* LEDs to activate and *which* text to display.

All boards in the Synergy 100 MD frame also contain a TI MSP430 microcontroller to manage upgrades, system booting, and other housekeeping functions.

A Note About CPU Architecture

Virtually all of the lookup tables and all of the bits that are used to configure the hardware and map the crosspoints are set *every field*. The system is in effect performing a complete memory recall operation every single field, always guaranteeing that the control panel is set properly. In terms of the architecture, there is no difference between a *requested* memory recall operation and the way that the switcher updates the panel normally — every field.

In addition to increasing the system's reliability tremendously, this functionality also allows you to return to the *exact* state of the panel, should a power failure occur.

Board Labeling

The figure below illustrates a typical circuit board label:
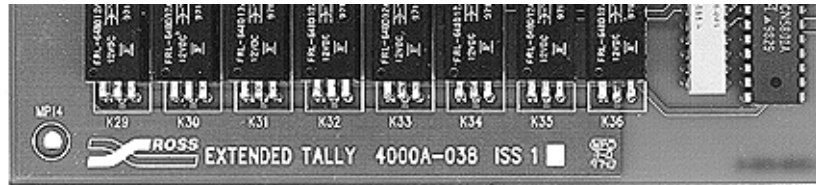
Circuit Board Labeling Scheme

For all system circuit boards, the following data is listed:

- Ross Logo

- Board name

- Board number

- Board revision (**ISS** = Issue)

Where a white square is present in the label string, letters *may* be written within the square to indicate a minor variation on the board itself.

Physical Installation

In This Chapter

This chapter provides instructions for installing Synergy 100 MD switcher hardware. The following topics are discussed:

- Static Discharge
- Getting Started
- Equipment Overview
- Installation at a Glance
- Hardware Installation
- Removing and Installing Circuit Boards
- Connecting Frame Power
- Installing Peripheral Equipment
- Installing the Control Panel
- Installing the Electronics Frame
- Removing and Installing the Frame Door
- Front Frame Circuit Boards
- Rear Frame Circuit Boards

Static Discharge

Operating Tip	Refer to "**Appendix C. Installation Worksheets**" for worksheets you can use to record switcher installation and wiring connections.

Throughout this chapter, please heed the following cautionary note:

ESD Susceptibility	Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling the switcher circuit boards in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Touch the frame to dissipate static charge before removing boards from the frame and exercise proper grounding precautions when working on circuit boards.

Getting Started

The following topics are covered in this section:

- Unpacking
- A Word About Serial Numbers

Unpacking

A complete Synergy 100 MD switcher system is typically shipped in three (or more) boxes, as outlined below. Your shipping configuration may vary.

- **Box 1** contains the electronics frame, with circuit boards installed inside the frame itself.
- **Box 2** contains the control panel — including its power supply.
- **Box 3** contains all other options and accessories such as Remote Aux Panels, coax cables, and manuals.

⚠️ **Caution**
> The control panel and frame are heavy units, which are both top-loading. It is *highly recommended* that you use two people to lift and unpack each unit.

Once the boxes are unpacked, check the contents against the packing list to ensure that all items are included. If any items are missing or damaged, contact your sales representative or Ross Video Limited immediately.

A Word about Serial Numbers

Serial numbers have been implemented to allow Ross Video to properly track which options have been purchased by each customer. switchers have serial numbers installed (in flash memory) at the factory. Refer to the section "**Installing the Control Panel**" on page 3-9 for more information.

Equipment Overview

This section provides a hardware overview of the Synergy 100 MD switcher.

Control Panel — Top View

The following figure illustrates a top view of the Synergy 100 MD control panel. Full details are provided in the *Synergy 100 MD Operator's Manual*.
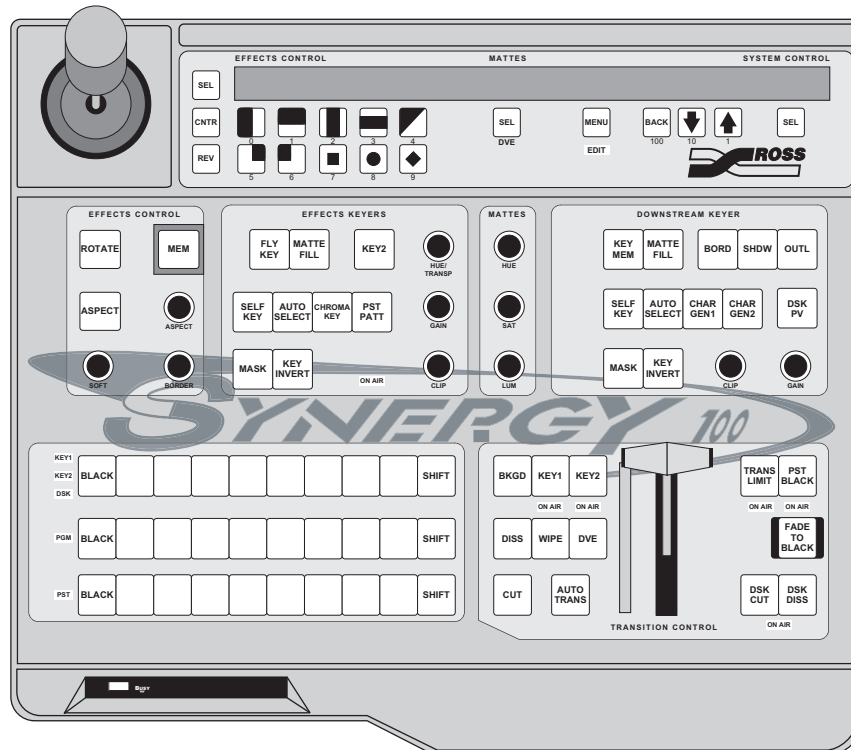
Synergy 100 MD Control Panel

⚠	**Important**	**Accessory Identification:**
		This control panel must be used with the Synergy MD Rack Frame. In addition, the power supply used must be the Globtek Inc. Power Adaptor, Model GT-21097-4812.

Control Panel Ports

The following figure illustrates the rear ports on the Synergy 100 MD control panel.
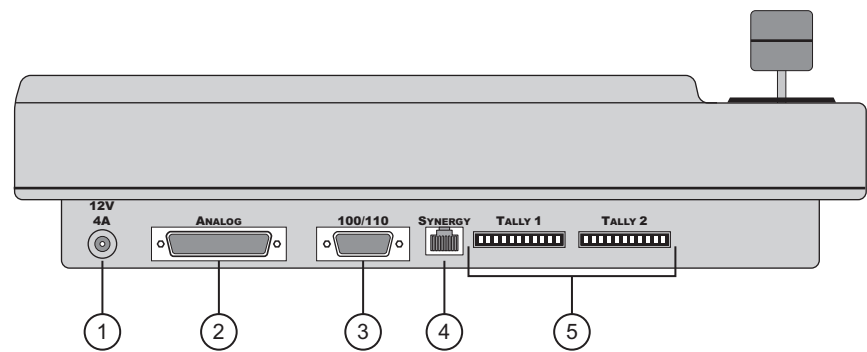
Synergy 100 MD Control Panel — Rear View

1) Power	3) 100/110 Port	5) Tally Ports
2) Analog Port	4) Frame (Synergy) Port	

1. Power

One DC connector is provided to supply power to the control panel.

2. Analog Port

This connector is currently not used.

3. 100/110 Port

This connector is currently not used.

4. Frame Port

One 8-pin shielded RJ-45 connector (**FRAME**) is provided for communications between the frame (**PANEL** connector) and the Synergy 100 MD control panel.

⚠ **Important** | The cable for connecting the Synergy Control Panel to the Synergy Frame is *not* wired as a standard CAT5 ethernet cable. If you need a cable of a specific length, contact your Ross Video Representative for ordering information.

5. Tally Ports

Two 12-pin ports labeled **TALLY 1** and **TALLY 2** are provided for a total of 16 standard panel tally relays.

Synergy 100 MD Frame

The following figure illustrates the rear of the frame.
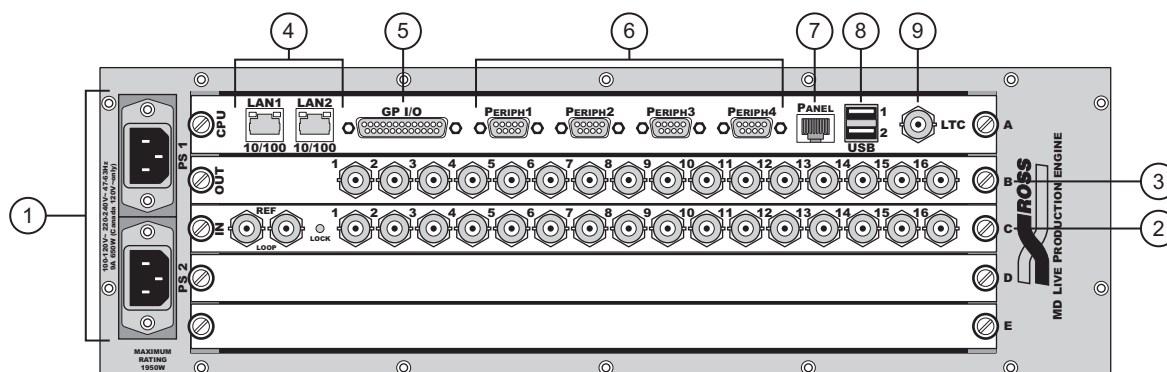
Synergy MD Frame — Rear View

1) Power Ports	4) LAN Ports	7) Panel Port
2) Input BNCs	5) GP I/O Port	8) USB Ports
3) Output BNCs	6) Peripheral 1 - 4 Port	9) Time Code Input BNC

1. Power Ports

Two AC ports are provided for frame power. Note that the Synergy 100 MD frame comes standard with one AC power supply factory-installed in the top slot. Refer to the section "**Connecting Frame Power**" on page 3-20 for complete instructions on connecting your AC power sources. Refer to the section "**Power Supply Functional Components**" on page 13-3 for full details on the power supplies and indicators.

2. Input BNCs

Sixteen BNCs are provided for a maximum of 16 digital video inputs.

Each input is identified by the uppercase letter that appears at the end of each row of inputs (i.e. **C**), and the number, from **1** to **16** inclusive, at the upper-left corner of the BNC connector (e.g. **C10**, **C12**, etc.). The analog reference inputs, if present on the card, are identified by the **REF** label that appears between the two BNC connectors.

Even though an input is *physically* connected to a numbered input connector, you can electronically place that input anywhere on the control panel's MLE bus row. All input configuration is performed through the menu system.

3. Output BNCs

Sixteen BNCs are provided for the video output of the switcher. Each output is identified by the uppercase letter that appears at the end of the row of outputs (i.e. **B**), and the number, from **1** to **16** inclusive, at the upper-left corner of the BNC connector (e.g. **B10**, **B16**).

All outputs are fully configurable, multi-definition video outputs that can be used as Aux Buses, MLE Program, MLE Preview, MLE Clean Feed, Preview Overlay, External DVE Send, or MultiDSK.

4. **LAN Ports**

Two 10/100 Base TX Ethernet ports are provided for connection of the frame to a network for upgrades, and to transfer images and animations from a computer to the internal hard drive of the switcher for use by the Global-Stores.

5. **GPI I/O Connector**

One DB25 port, labeled **GPI I/O**, is provided for connection of an interface device that will trigger cut, auto transition, Custom Control button, and memory recall functions. Please note:

- As standard, the port provides one common ground, 10 GPI outputs, and 10 GPI inputs.
- The remaining 4 pins are used as power-fail relays. These normally closed relays open in the event of a power failure, or other system fault that prevents a reliable program output.

6. **Peripheral 1 - 4 Ports**

Four DB9 ports, labeled **PERIPH1**, **PERIPH2**, **PERIPH3**, and **PERIPH4**, are provided for connection to and interface with external edit controllers and DVEs. These ports support both RS-232 and RS-422 standards. Please note:

- The appropriate software must be installed in order to properly control these devices.
- The ports are configured through the switcher's menu system.

7. **Control Panel Port**

One 8-pin, shielded, RJ-45 port, labeled **PANEL**, is provided for communications between the Synergy MD frame and the control panel.

<table>
<tr><td>⚠✱</td><td>**Important**</td><td>The cable for connecting the Synergy Control Panel to the Synergy Frame is *not* wired as a standard CAT5 ethernet cable. If you need a cable of a specific length, contact your Ross Video Representative for ordering information.</td></tr>
</table>

8. **USB Ports**

The two integrated USB ports allow the connection of USB peripheral devices.

9. **Time Code Input**

The Time Code Input allows the system to be synchronized to an external time reference

Installation at a Glance

The following section presents a *brief* overview of the installation process. The exact steps taken in installing your switcher will depend on the specific options that you have purchased.

Note   All cautionary rules regarding static discharge apply. Refer to the section "**Static Discharge**" on page 3-2 for details.

Experienced installers may wish to work from this outline as required.

- Install the control panel.

- Install the frame in an equipment rack.

- Install the frame power supplies.

- Perform the basic cabling:

  ~ control panel to frame interconnection

  ~ reference input(s)

  ~ switcher interconnections

  ~ connections to preview and program monitors

- Power up and do a quick video check on the switcher.

- Decide on inputs and install push-button inserts accordingly.

Note   Push-button inserts may be downloaded from the Ross Video website at http://www.rossvideo.com, and printed at your facility.

- Connect inputs.

- Connect output monitors as required for your installation.

- Make connections to external equipment. The ways of connecting such sources will depend on personal preference as well as on the combination of options purchased with the switcher.

- Connect character generator Key (alpha) and Video input signals.

- Connect the tallies.

- Connect and set up the general purpose interface, configuring the editor GPIs and the Aux Bus GPI inputs and outputs.

- Configure the switcher personality according to your installation requirements and personal preferences. The many operational parameters include editor related functions, auto keying selections, Aux Bus and memory configuration, and various button assignments and operational shortcuts.

Note   The previous steps cover switcher installation and configuration. Additional appendices at the end of this manual provide information for interfacing with DVEs and installing hardware options.

Hardware Installation

This section describes procedures for installing the following components of the Synergy 100 MD switcher system:

- Installing the Control Panel
- Installing the Electronics Frame

This equipment is to be installed and serviced by qualified personnel only.

| ✎ | **Note** | To ensure safe installation of your switcher, refer to the "**Important Regulatory and Safety Notices to Service Personnel**" section at the front of this manual for details. |

| ✎ | **Note** | The frame and control panel have separate power supplies. |

Installing the Control Panel

The control panel is shipped with all its circuit boards in place — you only have to install the control panel tub and some push-button inserts. The tub is designed so that it can be set into a desk (or console cutout), installed on a sliding shelf within the rack unit, or simply set on the desktop.

| ✎ | **Note** | The control panel is designed as a closed unit, so there is no need to access the inside of the panel under normal conditions. |

Installing your Control Panel into a Desk

Use the following procedure to install the control panel into a desk or console cutout:

1. Measure your console according to the measurements illustrated below. Centimeters are shown in parenthesis.

Synergy 100 Control Panel Cutout Dimensions
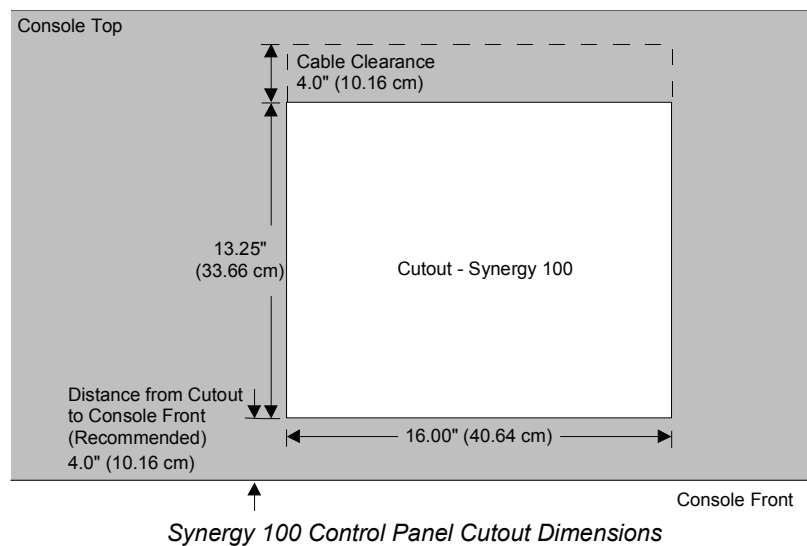
2. In addition to the cut-out measurement, ensure that there is sufficient clearance *under the desktop* for connectors and cables on the rear of the control panel. Approximately four inches (10.16 cm) of clearance should be sufficient, as displayed in the following figure.
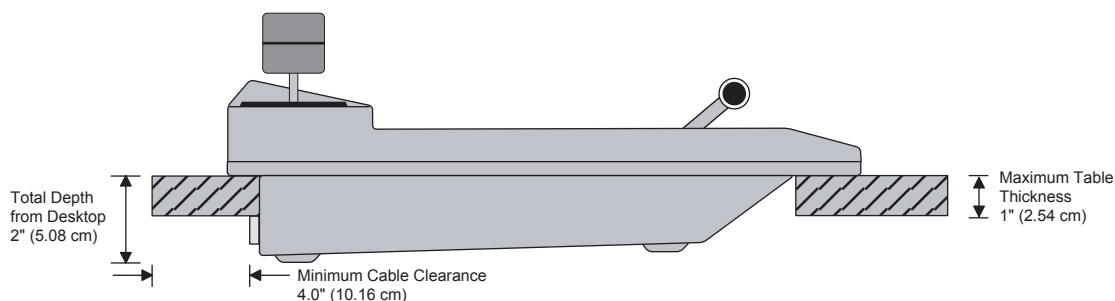
Detail — Control Panel Port Clearance Requirements

3. Install the control panel in your console. The tub drops into the cut-out from above and rests on edge supports at the sides.

Note The Synergy 100 MD control panel can simply be set on the desktop, if preferred.

4. Normally, fasteners are not required to hold the control panel in place. However, if your installation requires it (particularly for remote trucks), you can attach the tub to the desk using the optional mounting bracket assembly.
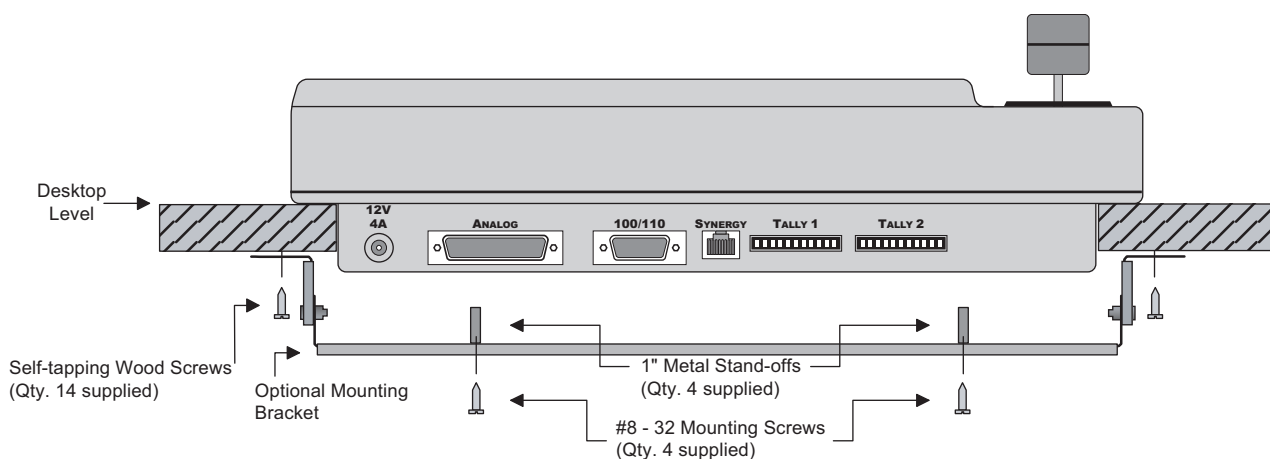
Detail — Optional Mounting Bracket Assembly

5. Install control panel power.

6. Connect the Model GT-21097-4812 power supply (supplied by Ross Video) to the DC connector.

This completes the procedure for installing the control panel into a desk or console cutout.

Installing the Sliding Shelf (Optional)

Use the following recommended procedure to install the optional sliding shelf within the rack frame:

1. You must have 5 RUs of rack space available in order to install the optional sliding shelf. The shelf itself is installed at the bottom, with 4 RUs above it providing the space required for the Synergy 100 MD control panel.

2. Attach the front of the shelf brackets to the frame through the holes provided. Please note that we do not supply the screws for this step.
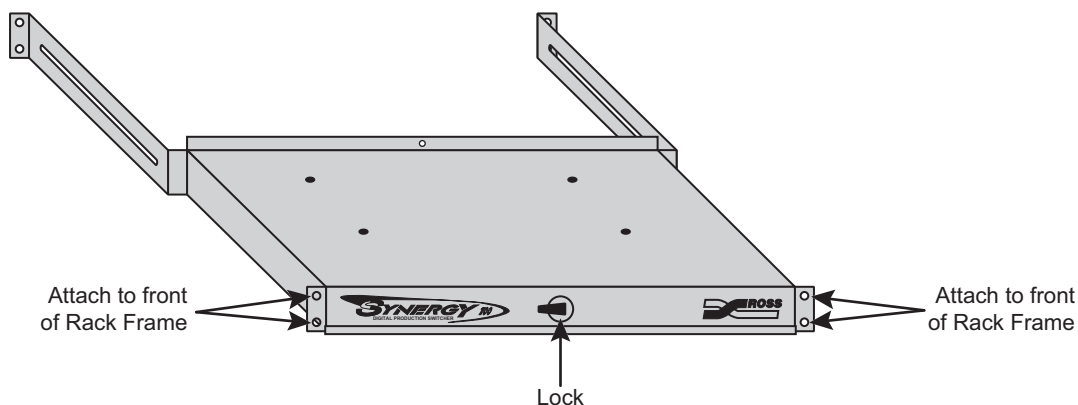
Front View of Sliding Shelf

3. At the rear of the shelf, there are two stiffening brackets which have been attached with one screw and a nut each. The *nuts* must be removed for the next step. Refer to the following diagram.

4. Attach the two adjustable rear brackets to the rack, with the screw from the stiffening bracket extending through the adjustment slots. Please note that we do not supply the screws for the bracket-to-rack installation.
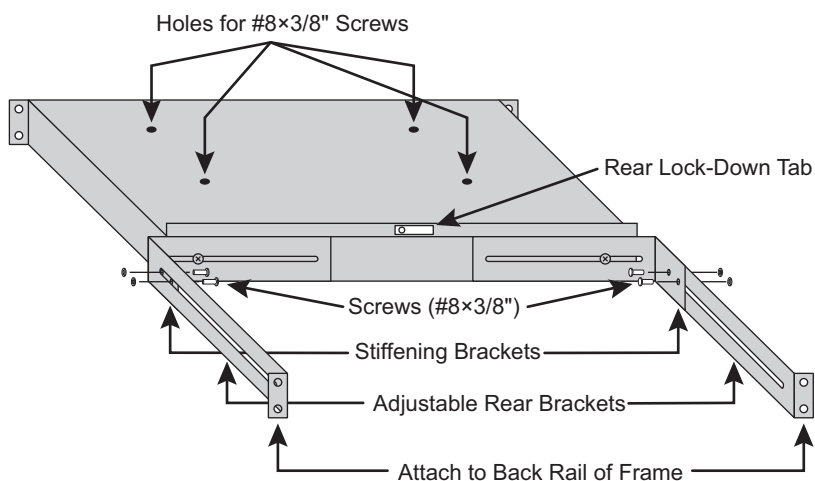
Rear View of Sliding Shelf

5. Replace the nuts that you removed in step 3, and tighten.

6. Insert the #8 × 3/8 screws (supplied) through the second hole in the stiffening brackets and through the slots in the adjustable brackets. Install the nuts over the screws and tighten.

7. From the front of the rack frame, set the Synergy 100 control panel on top of the shelf, with the four holes on the bottom of the control panel lining up with the four holes on the shelf.

8. Insert the four #8 × ¾ screws (supplied) up through the *underside* of the shelf into the control panel tub, and tighten.

9. This completes the installation procedure. You can now slide the shelf into the rack and secure it by turning the locking device on the front panel. In addition, the rear lock-down tab (as illustrated in *Rear View of Sliding Shelf*) can be rotated downward and tightened for added security during transportation of your unit.

⚡ **Warning** | The control panel's power supply is not intended to be field serviced — it is serviced by *replacement only*. In case of power supply failures, please contact your dealer or Ross Video. The power supply cover should only be removed by qualified service personnel.

This completes the control panel installation.

Installing the Electronics Frame

The electronics frame is designed to be rack mounted. Note the following installation requirements:

- **Rack Units**: RU

- **Height**: 5.25 inches (13.34 cm)

- **Depth**: 25 inches (63.50 cm)

- **Rack**: standard 19 inch wide equipment rack

⚠ **Caution** | Ensure that you leave space around the electronics frame for adequate ventilation. Both sides of the frame must be kept clear so that switcher airflow is not restricted in any way. Failure to provide adequate ventilation could result in overheating and damage to your switcher may occur.

Install the frame for maximum stability during operation, and in such a way as to allow adequate ventilation. Ensure that *both sides* of the frame are clear, so that switcher airflow is not restricted in any way. If possible, but not required, leave a 1RU space above the frame to facilitate installation and removal of the frame door. The frame's location should be accessible, dry, and dust free.

To ensure maximum stability, the Synergy 100 MD frame is mounted to the rack using two support brackets that are located at the rear of the frame. These brackets are included in your Installation Kit.

Use the following procedure to secure the support brackets to the frame:

1. Remove the frame door as per the instructions in the "**Removing/Installing the Frame Door**" section below.

2. Remove the support brackets from the Installation Kit that you received with your shipment.

3. Using standard rack mounting screws (not supplied), attach the support brackets to the Rear Panel Mounting Flange as per the diagram on the following page. The support brackets are adjustable, for your convenience.

Rear Panel Support Flange

Support Bracket

Rack

Rear of Synergy 100 MD Frame with Support Brackets Installed

4. Install the frame into the rack, as desired, and secure the support brackets to the rack rails.

5. Re-install the frame door as per the "**Removing/Installing the Frame Door**" section below.

⚠ **Notice** | Failure to install the support brackets as instructed will void the warranty.

This completes the procedure for securing the support brackets to the frame.

Notes on Hardware Installations

Please note:

- The system is shipped with the door on.

- The system is shipped with all circuit boards, the requested quantity of input and output boards, and the power already installed. If you have reason to remove or install additional printed circuit boards, most boards *are* hot-swappable. The circuit board extractors on the sides of the boards allow easy installation and removal.

- As a precaution after installation, ensure that all boards are tightly pushed into their midplane connectors.

Removing and Installing the Frame Door

If you are installing hardware options, or replacing circuit boards or power supplies, you will be required to remove and re-install the frame door.

⚠️ **Caution** | The frame door is *completely* removable and quite heavy, so care must be taken when performing these procedures.

Removing the Frame Door

✳️ **Important** | The Frame Door must be installed on the frame for proper cooling. Leaving the frame door off may cause the Frame to overheat.

Use the following procedure to remove the frame door. Refer to the following diagram for reference.
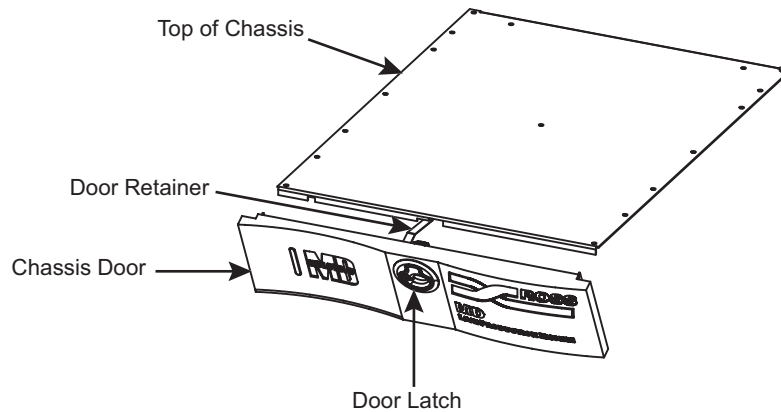
Synergy 100 MD Frame

1. Gently pull the door latch out and up, releasing the door from the top of the frame. Note that the door retainer prevents the door from falling.

2. With both hands, grasp the sides of the door, and gently lift it. Rotate the bottom towards you until the bottom edge clears the pivoting tongue on which it rests, and the door retainer is free of the frame top plate.

3. Move the door away from the frame, and place it on a clean, flat surface.

This completes the procedure for removing the frame door.

Installing the Frame Door

Use the following procedure to install the frame door. Refer to the following diagram for reference.
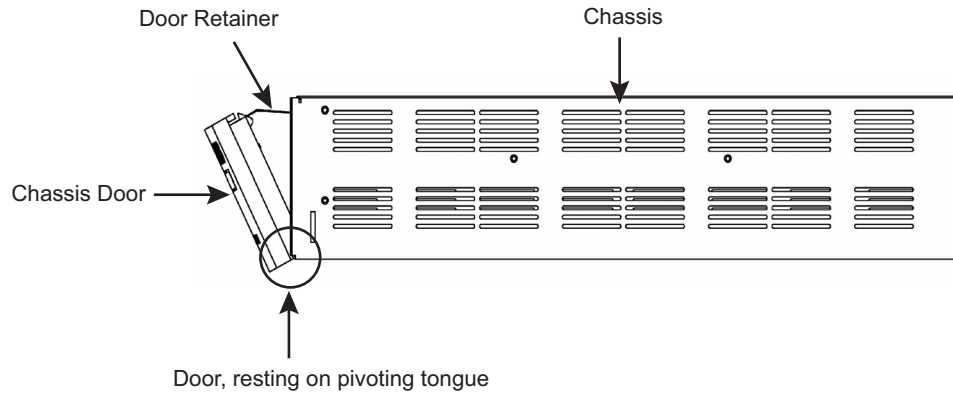
Synergy 100 MD — Side View

1.   With both hands, grasp the sides of the chassis door, and, ensuring that the door retainer is under the chassis top, hook the grooved bottom edge over the pivoting tongue on the bottom front ledge of the chassis.

2.   When you are satisfied that the door is resting properly, *firmly* press the top of the door until the latch pops into place and is secure.

3.   Check your work.

This completes the procedure for installing the frame door.

Removing and Installing Circuit Boards

The Synergy 100 MD frame comes standard with all the circuit boards already installed. If daughter cards or boards need to be installed, or replaced, you will have to go into the Synergy 100 MD frame and either remove and install or install the boards you need.

When a new board is installed, the switcher checks the current version of software on the board and tries to upgrade it the current version of the switcher. If the software on the board is the same as the software on the switcher, there is no change. If the board has a software version that is different than the version on the switcher, the switcher will upgrade the board to the same version as the switcher. For this reason it is important that you upgrade your switcher to the latest version of Synergy 100 MD software prior to installing a new board into the frame.

Refer to the section "**Software Upgrade**" on page 6-10 for more information on upgrading your switcher.

Front Frame Circuit Boards

The circuit boards at the front of the Synergy 100 MD frame manipulate video coming from the Video Input Board at the back of the frame. These boards can be removed and replaced as needed by removing the front door of the frame and sliding the desired boards out.

Removing Front Frame Circuit Boards

Important | If you remove a board that is providing a resource that is being used on-air, that resource will no longer be available when that board is removed.

Use the following procedure to remove circuit boards from the front of the Synergy 100 MD frame:

1. Backup any system setup configurations you have on the switcher. Refer to the section "**System Backup**" on page 6-10 for more information.

Note | All cautionary rules regarding static discharge apply. Refer to the section "**A Word About Static Discharge**" at the front of this manual for more information.

2. Remove the front door from the frame. Refer to the section "**Removing and Installing the Frame Door**" on page 3-14 for more information.

3. Locate the board you want to remove. Refer to the figure on the following page.
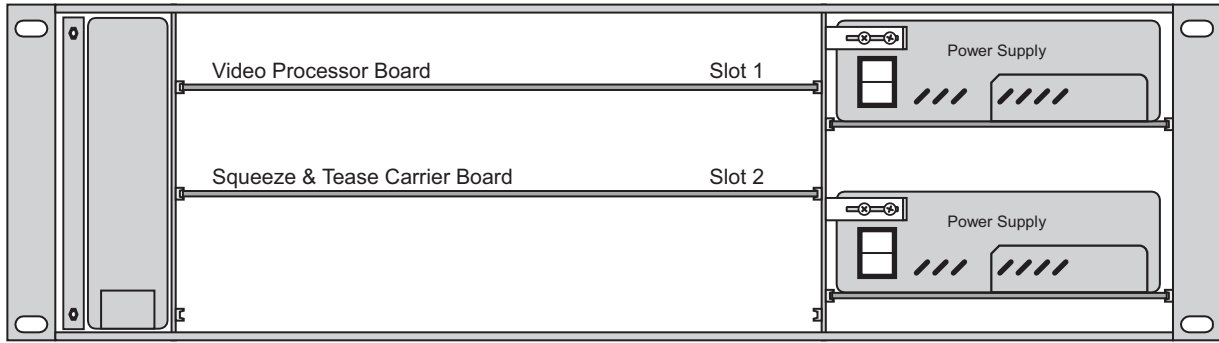
Synergy 100 MD Frame — Front Frame Boards

Synergy 100 MD Front Frame Boards

Slot	Board
1	Video Processor Board
2	Squeeze & Tease MD Carrier
3	(Empty)

4. If a tie wrap has been used to secure the extractor tabs on the sides of the board, remove the tie wrap.

5. Locate the two locking tabs at either side of the board you want to remove.

6. Grasp both locking tabs and rotate them towards you and out towards the outer sides of the frame. This will unseat the board from the midplane.

7. Gently slide the board out of the frame and place it on a clean, flat, static free surface.

This completes the procedure for removing a front frame board.

Installing Front Frame Circuit Boards

Use the following procedure to install printed circuit boards in the front of the Synergy 100 MD frame:

1. With the frame door removed, locate the slot into which you will be installing the circuit board. Refer to the section "**Removing Front Frame Circuit Boards**" on page 3-16 to ensure proper configuration.

2. Align the board with the guide rails and push the board in. When the board stops sliding freely, push firmly to seat the board, and secure it with the ejector tabs.

3. Locate the two small holes on the front edge of the board, near the extractor tabs, marked **SCRN1** and **SCRN2**. If you wish, you can further secure the board by threading tie wraps through these holes and fastening them around the extractor tabs.

4. Install the frame door as per the section "**Removing and Installing the Frame Door**" on page 3-14.

This completes the procedure for installing the printed circuit boards in the front of the Synergy 100 MD frame.

Rear Frame Circuit Boards

The Synergy 100 MD frame comes standard with **1 Video Input Board** and **1 Video Output Board**. If a replacement board is purchased, it must be installed in the proper slot at the back of the frame in order for the switcher to function properly.

Removing Rear Frame Circuit Boards

	Important	If you remove a board that is providing a resource that is being used on-air, that resource will no longer be available when that board is removed.

Use the following procedure to remove printed circuit boards from the rear of the Synergy 100 MD frame.

	Note	The switcher must be powered down before removing the Frame CPU Board. Refer to the section "**Shutting Down the Switcher**" on page 4-8 for more information on how to shut down the switcher.
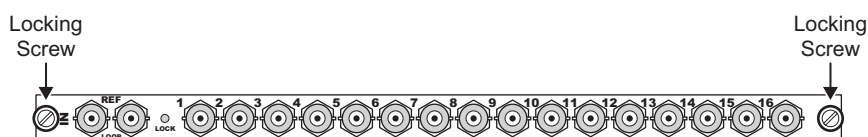
Locking Screws — Frame Rear Connector Panel

1. Locate the board you want to remove.
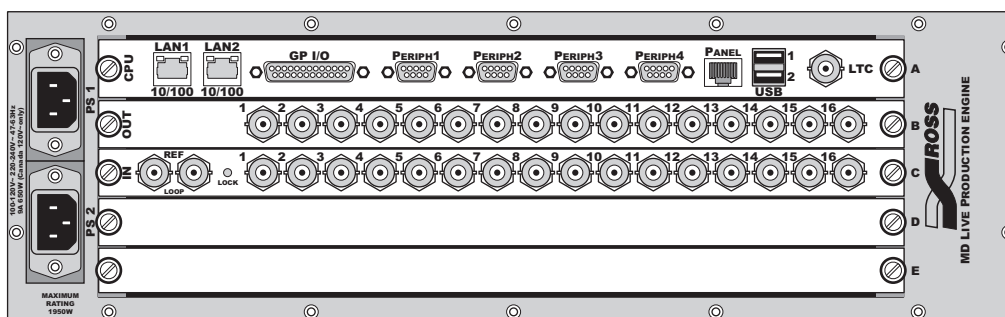
Synergy 100 MD Frame — Default Board Locations

Synergy 100 MD Front Frame Boards

Slot	Board
A	Frame CPU Board (4800A-001)
B	Video Output Board (4800A-064)
C	Video Input Board (4400A-060B or 4400AR-062)
D	(Empty)
E	(Empty)

2. Label and remove any cables connected to the board.

3. Loosen the locking screws on either side of the circuit board face plate.

4. Gently pull on the locking screws to unseat the board, and slide the board out of the frame. *Do not pull on any of the connectors*.

5. Place the board on a clean, flat, static free surface.

This completes the procedure for removing a frame board.

Installing Rear Frame Circuit Boards

Use the following procedure to install printed circuit boards in the rear of the Synergy 100 MD frame. Refer to the above diagram for reference

✎	**Note**	Throughout this procedure, take care not to damage the bronze-colored EMI gaskets located on the top of the circuit board face plates.

1. Locate the slot into which you will be installing the circuit board. The slots are labeled with letters from **A** to **E** inclusive. Refer to the section "**Removing Rear Frame Circuit Boards**" on page 3-18 for more.

2. Align the board with the guide rails and slide the board into the slot. When the board stops sliding freely, push firmly to seat the board.

✎	**Note**	Ensure that the board is properly aligned with the connectors on the midplane. The board should seat easily without too much pressure.

3. Tighten the captive screws on either side of the circuit board face plate.

4. Reconnect any cables as required.

This completes the procedure for installing a frame board.

Connecting Frame Power

⚡ **Warning** | This apparatus, when equipped with multiple power supplies, can generate high leakage currents. To reduce the risk of electric shock, ensure that each individual supply cord is connected to its own separate branch circuit with an earth connection.

Use the following procedure to install frame power:
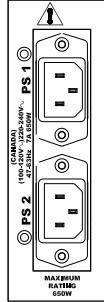
Power Connector Section

1. Connect the **PS 1** connector to an AC outlet.

2. If the **Redundant Power Supply** option is installed, connect the **PS 2** connector to an AC outlet.

Please note:

- Each AC connector includes a power lock, which is designed to retain the power cable connector.

✐ **Note** | Refer to the section "**Important Regulatory and Safety Notices to Service Personnel**" at the beginning of this manual for correct line cord information.

Power Failure

When the Synergy 100 MD switcher loses power, the frame and control panel react in the following fashion:

- A loss of control panel power *only* has no effect on the frame, because the frame stores the current video state. When control panel power is restored, your setups will return to their previous state.

✐ **Note** | Refer to the section "**Important Regulatory and Safety Notices to Service Personnel**" at the beginning of this manual for correct line cord information.

- If the frame is turned off, or the control cable is disconnected, the panel will indicate **Frame Comm Lost** across the display areas in the **Effects Control**, **Mattes** and **System**

Control Groups. When frame power is restored the panel returns to the default state with all control panel settings in factory default state.

- When power returns after a loss to both the frame and the control panel, control panel setting will return to the factory default state. Refer to the section "**Preliminary Functional Check**" on page 4-9 for factory default settings.

Installing Peripheral Equipment

Several ports are provided on the rear the frame for integration with various types of external equipment. Refer to the section "**Equipment Overview**" on page 3-4 for the location and description of these ports.

This section will provide you with procedures to follow in order to connect your peripheral equipment. The following topics are included:

- Tally Connections
- GPI I/O and System Fail Relay Ports
- Peripheral Control Connections

Tally Connections

Note | Prior to wiring each tally, ensure that you have completed the **Input Worksheet** found in the section "**Input Worksheet**" on page 19-2. You will need the information in the **Tally** column as a reference.

You will use the **Tally Setup Menu** to select the tally relays that are activated when control panel buttons are pressed. In this section, using the **Tally Column** on your "**Input Worksheet**" as a guide, you will wire each tally that you have assigned.

Tally connectors are located on the rear of the control panel:

- Ports 1 and 2 (and the associated tally relay electronics) are *standard*, each providing 8 tally relay contacts — for a total of 16 tallies.
- Each port is a 12-pin detachable terminal block.
- Each relay provides a contact closure to TALLY COMMON.

Using the tally pinout tables provided in Appendix A and the **Tally Column** data from your **Input Worksheet**, wire each 12-pin tally port. Connect the other end of the tally cable to your external equipment. Refer to the section "**Tally Ports**" on page 17-13 for pinout specifications.

Notes on Tally Connections

Please note:

- All relay contacts are normally open.
- Tally relay contacts are rated for a maximum of 10 VA (100 Vmax, 0.5 Amax) into a non-inductive load.
- Make all connection straight on, and allow at least four inches of cable clearance at the rear of the control panel.
- Be sure to fasten the clips to hold each connector in place. Run all tally cables in accordance with good engineering practice, and ensure that the cable will not be subjected to physical abuse.

Note | Red/green tallies are not currently implemented.

GPI I/O and System Fail Relay Ports

In this section, you will wire each GPI port that you have assigned to source and destination devices, respectively.

✎ **Note** | The System Fail Relays are not yet implemented. |

- Using the "**Standard GPI Pinout Table**" provided in Appendix A and the data from your "**Standard GPI Input Worksheet**", wire GPI input ports 1-10 (or simply the number of ports that you assigned) to each source device. Refer to your source device's *Installation Manual* for pinout information on the device's individual GPI output ports.

- Using the "**Standard GPI Pinout Table**" provided in Appendix A together with the data from your "**Standard GPI Output Worksheet**", wire GPI output ports 1-10 (or simply the number of ports that you assigned) to each destination device. Refer to your destination device's *Installation Manual* for pinout information on the device's individual GPI input ports.

Refer to the section "**GPI I/O Port**" on page 17-10 for standard GPI connector specifications.

Notes on GPI I/O and System Fail Relay Ports

Please note:

- Standard GPI Connector type: 25-pin "D" SUB Female

- GPI Out 1-10: active drive 5V TTL-compatible signals

- GPI In 1-10: 5V TTL-compatible edge or level trigger

- System Fail and System Fail Return relays: 0-24VDC, normally-closed contact-closure FET relays.

- Run all GPI cables in accordance with good engineering practice, and ensure that the cable will not be subjected to physical abuse.

Peripheral Control Connections

The Synergy 100 MD frame provides 4 peripheral ports to allow the serial control of a number of different devices.
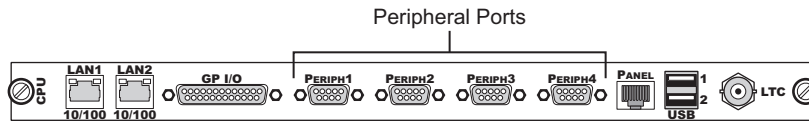
Synergy 100 MD Frame CPU Board — Peripheral Ports

Peripheral Ports 1 through **4** are DB9 ports that are provided for connection to a peripheral device, such as external editors and DVEs. Refer to the section "**Editor Communication Setup**" on page 9-3 for full details on configuring your switcher for external control.

Preliminary Cabling and Video Installation

In This Chapter

This chapter outlines procedures for making basic control panel, frame, reference, and monitor connections. It also describes the connections required to provide video and key signals to all areas of the switcher. You will complete input and output worksheets, connect inputs and alpha signals, install all pushbutton inserts, and connect your switcher outputs. A preliminary functional check procedure is also provided.

The following topics are discussed:

- Cabling
- Control Cable Installation
- Reference Signal Connection
- Monitor Connection
- Power Up
- Resetting the Switcher
- Software Reset
- Full Restart
- Preliminary Functional Check
- Basic Troubleshooting
- Switcher Timeout
- Input Worksheet
- Connecting and Verifying Inputs
- Input Connection
- Input Verification
- Pushbutton Inserts
- Control Panel Pushbutton Inserts

Cabling

In this section, the following connections are made:

- Control Cable Installation

- Reference Signal Connection

- Monitor Connection

Once these basic connections have been completed, a preliminary functional check can be performed to ensure that the switcher is passing video. The following figure illustrates the connections that you will make in this chapter.
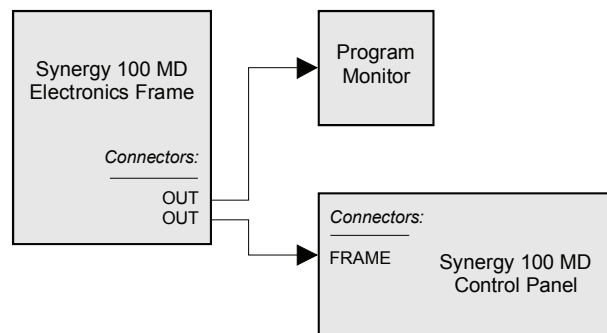
Preliminary Cable Connections

Control Cable Installation

Refer to the following figure during the control cable installation.
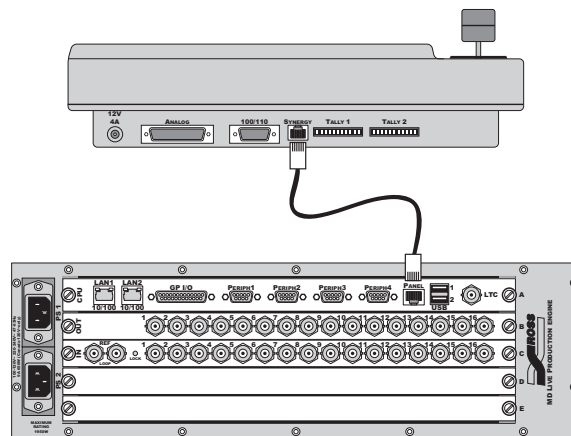
Frame to Synergy 100 MD Control Panel Interconnection

⚠	**Important**	The cable for connecting the Synergy 100 MD Control Panel to the Synergy MD Frame is *not* wired as a standard CAT5 ethernet cable. If you need a cable of a specific length, contact your Ross Video Representative for ordering information.

Use the following procedure to install the control cable between the electronics frame and the control panel:

1. Ensure that you have the correct **8-pin** shielded Telco cable, with **8-pin** connectors at each end. Because of their small size, all Telco connectors look quite similar.

2. Using an 8-pin shielded Telco cable, connect the communications port labeled **PANEL** (on the electronics frame) to the communications port labeled **SYNERGY** (on the rear of the control panel).

This completes the procedure for installing the control cable between the electronics frame and the control panel.

Please note:

- The maximum cable length is 1000 feet (305 meters).

- The cable must be run in accordance with good engineering practice. Ensure that there is sufficient room for the cable and that enough slack is left in the cable run to permit long, gentle bends. Always install cables so that they will not be subjected to physical abuse.

Reference Signal Connection

An analog Tri-Level Sync or Composite reference signal must be connected to the reference loop BNCs on one of the Video Input Boards on the switcher.

Reference Connectors
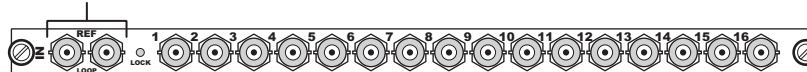
Video Input Board — Reference Connectors

Note

| If the reference loop is not connected, the loop BNC should be terminated with a 75ohm termination. |

Connect the reference signal to one of the 2 **REF** connectors on the **Video Input Board** in **Slot C**.

The following points should be considered when connecting a reference signal to your Synergy 100 MD switcher:

- Always use a stable signal that is low in jitter, and that preferably originates from a reliable analog test signal generator.

- The switcher regenerates color black from the reference input. Therefore, as a recommendation, if you select **COLOR BARS** as your reference, you can satisfy the reference requirement, automatically generate black and also provide the (typically) required color bar input — all in one signal.

Monitor Connection

Virtually any Output BNC of the switcher can be assigned as your program or preview output; however, if you have the MultiDSK™ options installed, Output BNCs **B1** through **B6** will be locked to specific output types.

If you are using a serial digital monitor, connection is direct. If you are using an analog monitor, one of three D-A converters is required:

- Serial Digital to NTSC
- Serial Digital to PAL
- Serial Digital to Analog Component

For more information on Ross Video's full line of conversion equipment, contact your sales representative or Ross Video Limited.

Power Up

Use the following procedure to power up the system:

1. Ensure that all power cables, including the DC power supply cable to the control panel, are fastened and secure.

Note There is no power switch on the Synergy 100 MD control panel. If the power supply is plugged in, the control panel is on.

2. Remove the front door from the frame. Refer to the section "**Removing and Installing the Frame Door**" on page 3-14 for more information.

3. Locate the power supplies on the right side of the frame.

4. Toggle each of the power supply switches to **ON** to power up the frame.

This completes the procedure for powering up the system.

Notes on Powering Up the Synergy 100 MD Switcher

Please note:

- The *order* in which you power up the frame and control panel is not important — either can be powered up first.

- Powering up the switcher causes the system to restore the *previous condition* that existed before power down. In the absence of a valid condition, a "reset" condition is presented, with the **BLACK** crosspoint selected on all buses. The switcher's memory contents are retained.

Resetting the Switcher

If required, the Synergy 100 MD can be reset manually from the control panel. There are two types of resets:

- A **Software Reset** affects software only
- A **Full Reset** affects hardware and software simultaneously

Software Reset

The software reset function is performed in the **Effects Control** and **System Control** groups. Use the following figure for reference:

⚛ **Important** | Performing a Reset will set all crosspoints to Black, including the main PGM output.
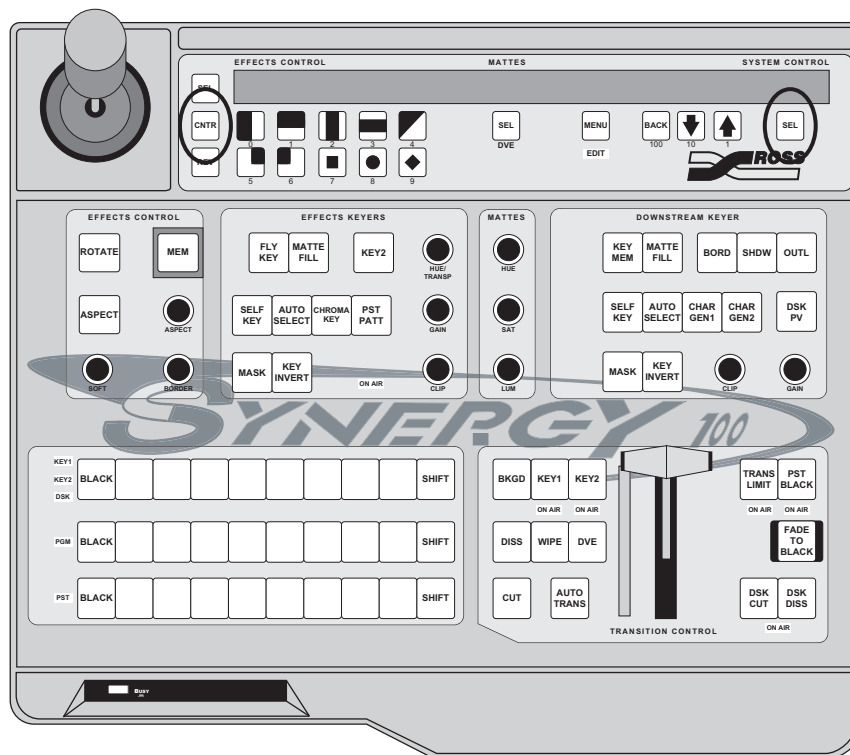
Software Reset Function

Press and hold the **CNTR** button in the **Effects Control Group** and the **SEL** button in the **System Control Group** to perform a software reset. Note the small "reset" symbols beside each button.

This resets the control panel to its default values. Switcher memory registers, personality registers, and installation registers are not affected by the reset, but all other switcher parameters, such as the current state of the panel, are reset. **BLACK** will be selected on all buses.

Full Restart

This function performs both a hardware and a software reset simultaneously. Switcher memory registers, personality registers, installation registers, and custom control registers are not affected by the reset, but all other switcher parameters, for example, the current state of the panel, are reset. **BLACK** will be selected on all buses.

⚠	**Important**	It is not recommended to reset the frame by turning the power off and then on again as this may damage the hard disk.

Use the following procedure to perform a full restart of the switcher:

1. Navigate to the **Default Menu** as follows:

   • Press **MENU** to display the **Main Menu**.

   • Press **7. Options** to display the **Options Menu**.

   • Press **5. System Resets** to display the **System Resets Menu**
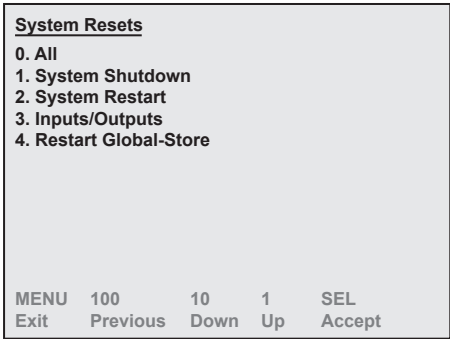
   ```
   System Resets
   0. All
   1. System Shutdown
   2. System Restart
   3. Inputs/Outputs
   4. Restart Global-Store




   MENU    100       10    1     SEL
   Exit    Previous  Down  Up    Accept
   ```
   System Resets Menu

2. Press **2. System Restart** to display the **System Restart Confirmation Screen**.

   ```



   Are you sure you want to RESTART the system?

   0. Confirm          1. Cancel




                       10     1     SEL
                       Down   Up    Accept
   ```
   System Restart Confirmation Screen
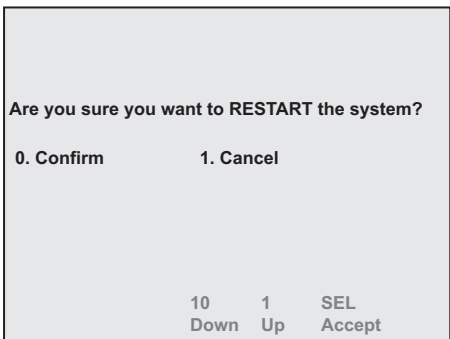
3. Press **0. Confirm** to restart the switcher.

✓	**Operating Tip**	Press **1. Cancel** to *not* restart the switcher and return to the **Default Menu**.

This completes the procedure for restarting the switcher.

Shutting Down the Switcher

This function powers off the switcher, placing the CPU Board into a hibernation mode. In this mode it is safe to turn off all your power supplies and remove the CPU Board.

⚠	**Important**	It is not recommended to shut down the frame by turning the power off, as this may damage the hard disk.

Use the following procedure to shutdown the switcher:

1. Navigate to the **Default Menu** as follows:

    • Press **MENU** to display the **Main Menu**.

    • Press **7. Options** to display the **Options Menu**.

    • Press **5. System Resets** to display the **System Resets Menu**.

```
Options S/N:XXXXXXXXXX

0. Network Setup          5. System Resets
1. Software Options
2. Panel ID         XXXX-X
3. Panel SW         X.X
4. Frame ID         XXXX-X




MENU    100      10    1    SEL
Exit    Previous Down  Up   Accept
```

System Resets Menu

2. Press **1. System Shutdown** to display the **System Shutdown Confirmation Screen**.

```



Are you sure you want to SHUTDOWN the system?

0. Confirm          1. Cancel




                   10    1    SEL
                   Down  Up   Accept
```

System Shutdown Confirmation Screen

3. Press **0. Confirm** to shutdown the switcher.

This completes the procedure for shutting down the switcher.

Preliminary Functional Check

At this point, the basic connections have been completed. With the switcher powered up, a preliminary functional check can be performed to ensure that the switcher is passing video. A variety of tests can be performed, including:

- Dissolves between **BLACK** and **COLOR BKGD**
- Wipes between **BLACK** and **COLOR BKGD**
- Fade to Black

All Ross Video products undergo thorough quality control and testing before shipment. The following preliminary check ensures that no damage has occurred during transit, and that all boards are correctly installed. Once the preliminary check is complete, the remaining installation procedures can be performed.

Preliminary Functional Check

With your video monitor properly connected, perform the following steps for a preliminary check:

1. Perform a full software reset, as outlined in the section "**Software Reset**" on page 4-6. This sets the panel to a *full* reset state.

2. Check the status of the control panel. In a reset (or "default") condition, the following buttons and indicators will be lit:

    - The first input (typically **BLACK**) is selected on the **PGM** and **PST** buses.
    - On the combined **KEY** bus, **KEY1** is lit and the first crosspoint is selected.
    - In the **Transition Control** group, the **BKGD** and **DISS** buttons are lit. A background dissolve is the switcher's default transition.
    - In the **System Control** group, the **MENU** button is lit and the display shows **AUTO** as the mode, with a transition rate of 30 (or 25 for PAL systems) frames.
    - In the **Effects Keyers** and **Downstream Keyer** groups, the **AUTO SELECT** button is lit.
    - In the **Effects Control** group, the **CNTR** button and button #0 (the vertical wipe) are lit.

3. Select sources for the transition:

    - Ensure that **BLACK** is selected on the **PGM** bus.
    - Select **BKGD** on the **PST** (Preset) bus.
        - ~ **Color Background** is factory preset to blue.

4. Ensure that **DISS** is selected in the **Transition Control** group.

5. While watching the monitor, move the fader from one limit to the other, and verify that the video dissolves from black to color.

Note | The LEDs in the **Transition Progress Bar** adjacent to the fader indicate the direction of travel. To complete the transition, simply continue moving the fader to the limit where the LEDs are *not* illuminated.

6. In the **Transition Control** group, press **WIPE**.

7. While watching the monitor, move the fader from one limit to the other and verify that the video *wipes* between color and black.

8. On the active bus, switch between two or three crosspoints to ensure that "cuts" are taking place.

This completes the preliminary check. Once you are satisfied that video is switching and mixing, continue with the remaining connection procedures.

Basic Troubleshooting

Note the following basic troubleshooting points:

- If you experience any problems with knobs, the fader, or the joystick during the preliminary functional check, there may be a problem with switcher calibration or MLE communications. Refer to the section "**Switcher Calibration**" on page 12-2 for instructions.

- If the system is not switching and is not outputting video, there may be a problem with the reference connection. Check that a valid analog reference is connected to the reference input. The system will not output video if the reference signal is invalid or not present.

For other switcher problems, please contact **Ross Video Technical Support**.

Switcher Timeout

If no control panel buttons are touched and the fader arm is not moved for a period of 10 minutes, the switcher goes into a "sleep" mode and all lights are automatically turned off. If this timeout occurs, press any button or move the fader (or joystick) to "wake" the switcher and turn on all lights. Please note:

- The switcher does *not* act on a button push when it is coming out of "sleep" mode.

- The factory default timeout interval is 10 minutes but can be changed as desired. Refer to the section "**Switcher Personality**" in the *Synergy 100 MD Operator's Manual* for details.

Input Worksheet

Complete the following worksheet for all of your video inputs, including primary sources, keys, and fills. To avoid marking up the *Synergy 100 MD Engineering Manual*, you can also use the worksheet provided in the section "**Input Worksheet**" on page 19-2 to make extra copies.

Following are basic input recommendations:

- Connect your analog reference to the reference input, as outlined in the section "**Reference Signal Connection**" on page 4-3.

⚠ **Important** | Until you connect the reference input, the switcher's video output will *not function*.

- Connect your primary video sources to inputs **C01**, **C02**, **C03** (etc.), and then continue forward in sequence.

  On the control panel, by default, input **C01** is mapped to pushbutton **2**, input **C02** is mapped to pushbutton **3**, etc. This association will minimize subsequent re-mapping of your inputs, and make it *very easy* for you to locate inputs on the panel during the initial cabling procedure.

- Connect your Key signals (alphas) to inputs **C16**, then **C15**, and continue backwards in sequence. This association will allow you to view each alpha during preliminary cabling, and will also assist in the subsequent alpha-to-video re-mapping procedure.

Completing the Input Worksheet

Using the above recommendations, complete the following input worksheet. The majority of this data will be used in the section "**BNC Configuration**" on page 7-3 to complete the configuration of each input.

For each input (moving from left to right in the worksheet columns):

- Fill in the *type* of input. Choose between:

  ~ Off

  ~ Alpha

  ~ Video

- If the input is a key fill, choose the alpha with which you want the key fill to be associated. List the primary source's BNC number.

- If the input is an alpha, choose between Shaped (**Yes**) or unshaped (**No**) keying mode.

- Fill in the audio channel or group associated with the input's two audio channels, if applicable.

- Fill in the desired panel button on which you want to place the input signal (including "shifted" buttons).

- Fill in the input's tally number.

- To avoid marking up the *Synergy 100 MD Engineering Manual*, use the blank worksheet provided in the section "**Input Worksheet**" on page 19-2 to make extra copies.

Input BNC Worksheet

BNC #	Actual Source	Remote Port	Device Address	Input Name	Input Type	Tally Number	Alpha Type	Auto Key	Audio Channel
Sample 1	CG Alpha	Remote 2		CG Alpha	Alpha	—	Shaped	C10	—
C01									
C02									
C03									
C04									
C05									
C06									
C07									
C08									
C09									
C10									
C11									
C12									
C13									
C14									
C15									
C16									

Connecting and Verifying Inputs

This section covers the following topics:

- Input connection
- Input verification

Input Connection

Using the data from the previous worksheet, connect your reference input, primary inputs, and all alpha inputs to the appropriate connectors on the rear of the frame. Remember that there are no specific "key" inputs — with the exception of the reference inputs, any input can be used for any purpose. All connectors are located in the "**Input**" section on the rear of the frame as shown below. Each input is identified by the letter **C** at the end of the row, and the number (**1** to **16** inclusive) at the top left of the connectors.
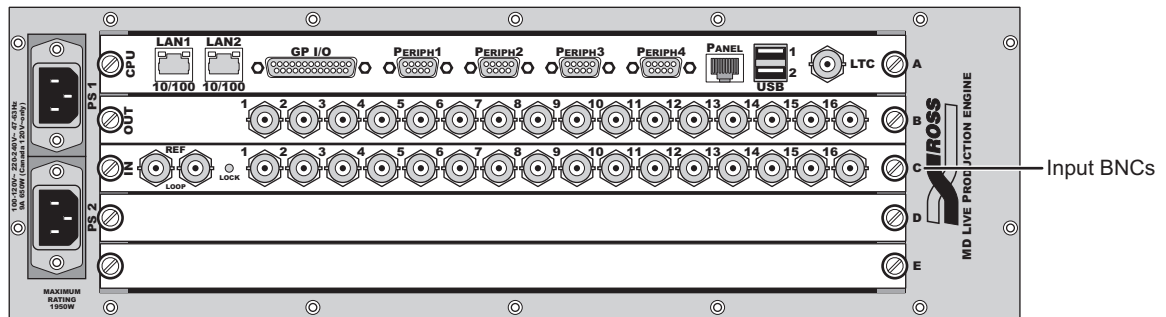
Synergy 100 MD Frame — Rear Input Section

Use cabling techniques in accordance with good engineering practice.

✎	**Note**	The Synergy 100 MD switcher passes all embedded audio and ancillary data signals, including "closed captioning" that are present on the background video. The MLE program output has the ancillary data associated with the MLE's background video.

Input Verification

For verification of your inputs, ensure that a monitor is connected to BNC output **B01** on your switcher. Remember that, at this point in the installation, default mapping is still in effect. The above-mentioned output is defaulted to **Program** out. Re-mapping of inputs will be performed in the section "**BNC Configuration**" on page 7-3. Configuration of outputs will be performed in the section "**Configuring the Outputs**" on page 8-4. During these procedures, you can map *any input* to any button on a bus row, and configure the outputs to be program, preview, clean feed or Aux Bus outputs.

On the unshifted row, default mapping is as follows:

- **BLACK** is mapped to button 1.
- **GLOBAL-STORE 1** is mapped to the second-to-the-last button.
- **SHIFT** is mapped to the last button in a bus row.

On the shifted row, default mapping is as follows:

- **BKGD** is mapped to the first *shifted* button.
- **GLOBAL-STORE 3** is mapped to the second-to-last *shifted* button.

Note

> If you double press a crosspoint button assigned to a Global-Store channel, the **Global-Store Menu** for that particular channel is displayed. You can use the menu to select an image and take it to air.

You can now verify input video signals as they are connected. The following check assumes a *default* switcher condition.

- To view the first 7 inputs (inputs **C01** through **C07)**, press button **2** through **8**, respectively. (Buttons **1**, **9**, and **10** are already mapped as indicated above).

- To view the next 7 inputs (inputs **C08** through **C14)**, press **SHIFT 2** through **SHIFT 8**, respectively. (Shifted buttons **1** and **9** are already mapped as indicated above, and button **10** is mapped to **SHIFT** on the shifted row).

- The remaining 2 inputs (inputs **C15** and **C16**) cannot be verified unless re-mapped.

Pushbutton Inserts

Once your inputs and alpha signals are connected, install the pushbutton designation inserts to identify the sources for your inputs.

Before proceeding to label and install control panel pushbutton inserts, note the following:

- All pushbutton inserts are printed on full-sized sheets of transparent plastic.

- For best results when cutting out the button inserts, use a sharp **X-ACTO®** knife and a steel-edged ruler.

- All inserts are easily installed under the lens caps.

- A **Lens Cap Remover** is supplied in the **Installation Kit** you received with your switcher.

Labeling Synergy 100 MD Buttons

Note that there are four ways of labeling Synergy 100 MD pushbuttons:

- Use our standard inserts. Push-button inserts may be downloaded from the Ross Video website at http://www.rossvideo.com, and printed at your facility.

- Ross Video will make *custom inserts* for your facility at a very reasonable price. Please call us for details.

- Make your own inserts using transparency material.

- Use a **Brother®** labeler to create your own labels

Standard films with common input designations are provided to all customers. If a designation that you require has *not* been included on a certain film, and it is a type likely to be needed by other switcher users, Ross Video would be pleased to consider adding it to the standard film.

Notes on Installing Control Panel Button Inserts

Please note:

- When reinstalling the lens assembly, line up the alignment and locking tab on the key cap with the alignment tab of the lens cap, and then with the locating slots in the primary input switch in the panel. Otherwise, the lens cap may pop off when the switch is pressed and released.

- The designation film must read correctly with the lens alignment tabs at the top and bottom, *not* at the sides.

- Perform this procedure for all buttons on each bus on your switcher.

Control Panel Pushbutton Inserts

Use the following procedure to install all control panel pushbutton inserts:

1. Cut out the designation film inserts for the primary input pushbuttons.

2. Remove the lens assembly from the primary input switch by pulling straight upward on the lens cap. Use the diagram on page 4-16 for reference.

Control Panel Pushbutton Insert

Lens Cap

Designation Film

Key Cap

Switch in Panel
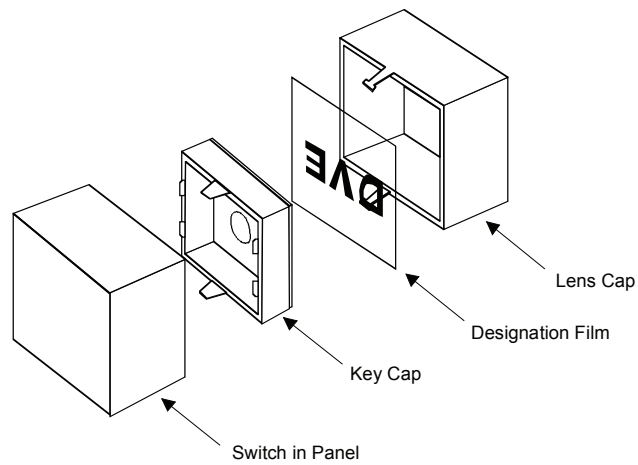
3. Remove the lens cap from the key cap and place the desired input designation under the lens cap.

This completes the procedure for installing all control panel pushbutton inserts.

Using the Menu System

In This Chapter

This chapter introduces the menu system of the Synergy 100 MD switcher. The following topics are discussed:

- Menu System Basics
- Menu Information
- Navigation Menus
- Option Menus
- Split Menus
- Menu System Operation
- Help Features

Menu System Basics

The menu system is accessed using the **System Control Group** of the Synergy 100 MD control panel and displayed on the preview monitor as a **Preview Overlay**.

The following figure details the panel buttons that are used to access the menus.
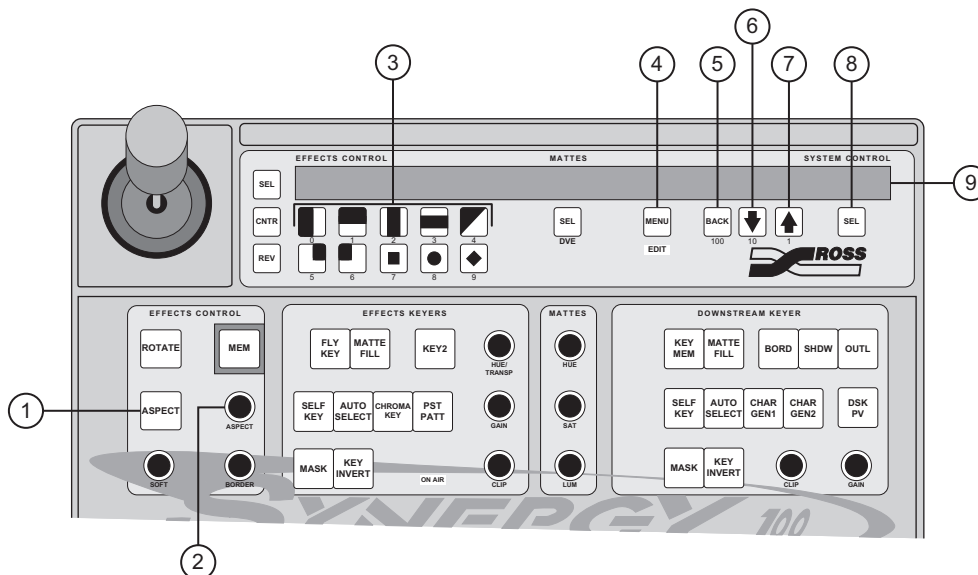
Synergy 100 MD Control Panel

1) ASPECT Button	4) MENU Button	7) UP (1)
2) SCROLL (ASPECT) Knob	5) BACK (100)	8) Right SEL Button
3) EFFECTS CONTROL Group	6) DOWN (10)	9) Display

1. ASPECT Button

The **ASPECT** button lights automatically to indicate that the **Aspect** knob is active and can be used to scroll through values in the menus.

2. SCROLL (ASPECT) Knob

The **Aspect** knob can be used to scroll through the menu values.

3. Effects Control Group

The **Pattern** buttons in the **Effects Control Group** allow you to use the menu system to navigate to sub-menus or select menu item by pressing the corresponding number. Refer to the section "**Menu System Operation**" on page 5-7 for more information.

4. MENU Button

The **MENU** button turns the menu system of the Synergy 100 MD on and off. When toggled on, the **MENU** button will light green and the **Main Menu** is displayed on the **Preview Monitor**.

✎ **Note**   You must have a monitor connected to Preview with Overlay, **BNC C02**, in order to be able to view the menu system.

5. **BACK (100)**

   Pressing the **BACK (100)** button will return you to the *previous* menu or position in the menu tree.

6. **⬇ (10)**

   Pressing the **DOWN ARROW (10)** button will scroll **DOWN** to the next item in a selection list or to the next menu item.

7. **⬆ (1)**

   Pressing the **UP ARROW (1)** button will scroll **UP** to the next item in a selection list or to the next menu item.

8. **Right SEL Button**

   Pressing the right **SEL** button will **SELECT / ACCEPT** your option, setup, or position in the menu tree.

9. **Display**

   Once you have entered the menu system, **MENU** appears in the four-character **MODE** displays in the **Effects Control** and **System Control Groups**. This identifies the menu system as the area of the control panel that has control of the buttons and knobs in the **Effects Control** and **System Control Groups**.

Menu Information

There are 3 types of menus on the Synergy 100 MD switcher that allow you to alter settings and configure inputs and outputs. These types are **Navigation Menus**, **Option Menus**, and **Split Menus**.

Navigation Menus

Navigation Menus, such as the **Main Menu**, are used strictly to navigate from menu to menu. They have no configuration options and will not change as you select different options.
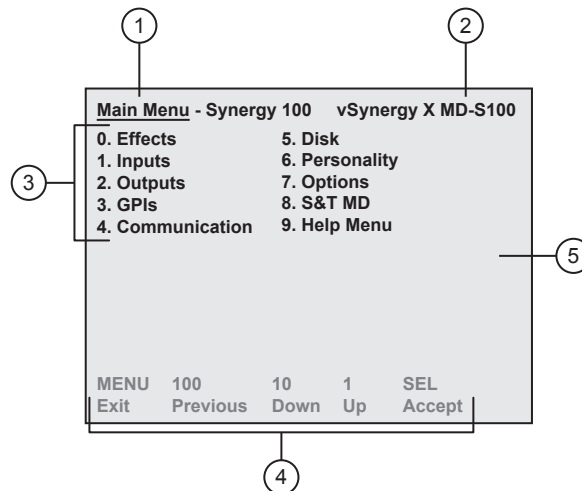
Navigation Menu Example — Main Menu

1) Menu Title	3) Menu Items (Headings)	5) Menu Background
2) Software Version (Main Menu Only)	4) Navigation Legend	

1. **Menu Title**

   Each menu is named in the upper left corner.

2. **Software Version**

   The **Main Menu** is the only one that displays the software version number in the upper right hand corner.

3. **Menu Items**

   Menu Items, or headings, can be selected to change their current settings, or used to navigate to sub-menus. Menu items that do not have selections next to them will take you to a sub-menu. Refer to the section "**Option Menus**" on page 5-4 for more information on menu selections.

   When a menu item is highlighted, this indicates that it is active and can be accessed using the right **SEL** button. When selected, the menu item or the selection for it, will change color to indicate that you can change the current configuration.

   | Note | If a menu item is gray, it cannot be changed. |

4. **Navigation Legend**

   The navigation legend provides information on how to navigate to the different sub-menus, or select menu items.

5. **Menu Background**

   The menu background can be turned on and off for some menus. When turned on, the images on the preview are not visible. This allows you to read the menu more easily.

   | Note | Menus such as the **UltraChrome Parameters Menu** turn the menu background feature off so that you can preview your Chroma Key before taking it on-air. |

Option Menus

Option Menus, such as the **Inputs Menu**, function in much the same way as the Navigation Menus, except that they allow you to configure specific settings on the switcher, as well as navigate to different menus. In many cases, these settings are dependent on each other, meaning that as you make a selection for one menu item, the other menu items will change to indicate the current setting. In the **Inputs BNC Config Menu**, for example, menu item **0. Output BNC** is used to select a BNC you want to configure. When menu item **0** is set to a BNC, all other menu items update to show the current configuration for the BNC you selected for **0. Input**.

```
Inputs
0. Input       BNC C01
1. Type        Off
2. AutoKey     Black
3. Shaped      No
4. Aud Chan1 Chan 1
5. Aud Chan2 Chan 2
6. Vid Format  720p 59.94




MENU   100       10    1    SEL
Exit   Previous  Down  Up   Accept
```
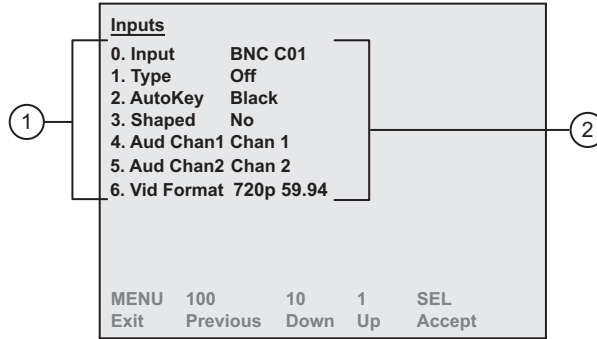
Option Menus Example — Inputs Menu

1. **Menu Items**

    Menu Items, or headings, can be selected to change their current settings, or used to navigate to sub-menus. Menu items that do not have selections next to them will take you to a sub-menu. Refer to the section "**Option Menus**" on page 5-4 for more information on menu selections.

    When a menu item is highlighted, this indicates that it is active and can be accessed using the right **SEL** button. When selected, the menu item or the selection for it, will change color to indicate that you can change the current configuration.

2. **Menu Selections**

    Menu Selections indicate the current configuration of a menu item. The menu items can be changed, allowing you to assign different configurations to the switcher, or to other menu selections.

Split Menus

Split Menus, such as the **Network Setup Menu**, are used to adjust multiple or complex, options for a single menu item. Split Menus are identified by a vertical line that separates the menu items from the options. When a menu item is selected, the configurable option for that item are listed below the vertical line. In the **Network Setup Menu**, for example, when you select **4. Secondary DNS**, the option for this item is displayed below the vertical line. As this option has 4 numbers that are to be entered, it is considered a complex menu item.

```
Network Setup
0. IP Address            5. DHCP   Off
1. Subnet
2. Gateway
3. Primary DNS
4. Secondary DNS

      Secondary DNS: 0.0.0.0




Use Hue to select element, Sat to adjust value.
Exit menu and reboot for settings to take effect
```
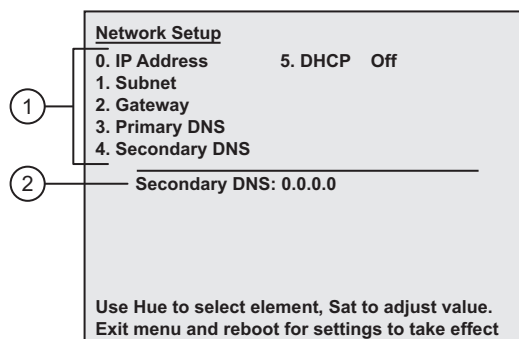
Navigation Menu Example — Network Setup Menu

1. **Menu Items**

    Menu Items, or headings, can be selected to change their current settings, or used to navigate to sub-menus. Menu items that do not have selections next to them will take

you to a sub-menu. Refer to the section "**Option Menus**" on page 5-4 for more information on menu selections.

When a menu item is highlighted, this indicates that it is active and can be accessed using the right **SEL** button. When selected, the menu item or the selection for it, will change color to indicate that you can change the current configuration.

2. Menu Selections

Menu Selections for some menus are separated from the menu items by a vertical line. This is often used when there are multiple selections for a single menu item, or if it is a complex selection with multiple parts, as in the case of the **Secondary DNS**.

This concludes the discussion on the types of menus on the Synergy 100 MD. For more information on using the menu system, refer to the section "**Menu System Operation**" on page 5-7.

Menu System Operation

The menu system on the Synergy 100 MD allows you to set up the various inputs and outputs, as well as communications with external devices and various peripheral settings for switcher operation.

In order to navigate through the menus of the Synergy 100 MD, you will have to learn how to access the menu system, navigate to the various menus on the switcher, and alter the setting you find on the menus.

The following example will show you how to navigate to the **Inputs Menu** and set up a particular Input BNC:
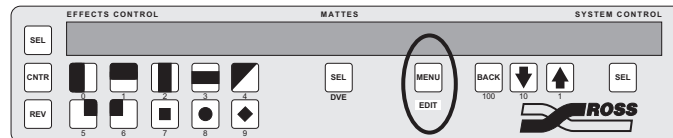
Menu Control Group — MENU Button

1. Press **MENU** in the **System Control Group** to display the **Main Menu**. The **MENU** button will light green and the **Main Menu** is displayed on the **Preview Monitor**.
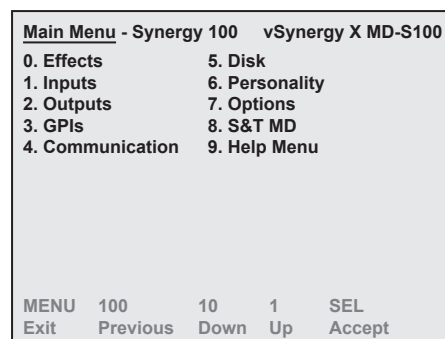
Main Menu

2. Navigate to the **Inputs Menu 1** as follows:

✓ **Operating Tip**

> Menu items that do not have a menu selection next to them, and are not part of a split menu, will display a sub-menu when selected.

• The **Pattern** buttons in the **Effects Control Group** each have a number below them, corresponding to the numbers beside the menu items.
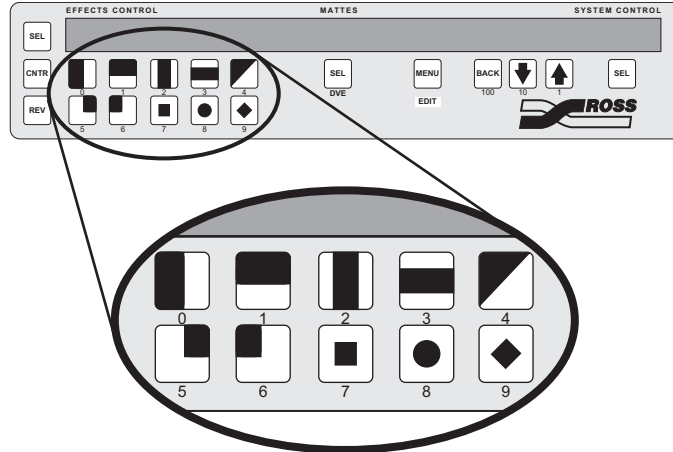
Effects Control Group — Pattern Button Numbers

- Press the **Pattern** button corresponding to the number next to the menu item that you want to select. In this case, press the pattern button with the **1** below it.

Operating Tip

> Navigation instructions are identified by the number next to the menu item. In this example you will navigate to the **Input Menu 1**, so you would be instructed to press **1. Inputs** to display the **Inputs Menu 1**.

- The **Inputs Menu 1** is displayed instead of the **Main Menu**. If the **Inputs Menu 1** is not shown, you can press the **BACK** button to return to the **Main Menu**. The **BACK** button will return you to the previous menu, or de-select a menu item you have selected.

Inputs Menu 1

3. Press **0. Inputs** to display the **Inputs Menu 2**.

```
┌─────────────────────────────────────┐
│ Inputs                              │
│                                     │
│ 0. Input      BNC C01               │
│ 1. Type       Off                   │
│ 2. AutoKey    Black                 │
│ 3. Shaped     No                    │
│ 4. Aud Chan1 Chan 1                 │
│ 5. Aud Chan2 Chan 2                 │
│ 6. Vid Format 720p 59.94            │
│                                     │
│                                     │
│                                     │
│ MENU  100        10      1    SEL   │
│ Exit  Previous   Down    Up   Accept│
└─────────────────────────────────────┘
```

Inputs Menu 2

✓ **Operating Tip**

> If you are not at the correct menu, or want to start over again, you can either press **BACK** until the **Main Menu** is displayed, or press **MENU** to turn the menu system off, and then press **MENU** again to turn the menu system on again. When toggled on by the **MENU** button, the **Main Menu** is displayed on **Preview Monitor**.

• Now that you have navigated to the proper menu, you can select the Input BNC you want to set up.

4. Select **Input BNC C10** as follows:

• Press **0. Input**.

• Use the ⬇ and ⬆ buttons to select **BNC C10**.

• Press the right **SEL** button to accept the new settings.

```
┌─────────────────────────────────────┐
│ Inputs                              │
│                                     │
│ 0. Input      BNC C10               │
│ 1. Type       Video                 │
│ 2. AutoKey    Black                 │
│ 3. Shaped     No                    │
│ 4. Aud Chan1 None                   │
│ 5. Aud Chan2 None                   │
│ 6. Vid Format 720p 59.94            │
│                                     │
│                                     │
│                                     │
│ MENU  100        10      1    SEL   │
│ Exit  Previous   Down    Up   Accept│
└─────────────────────────────────────┘
```

BNC C10 — Inputs Menu 2

• With **BNC C10** active, all the menu selections apply to this particular BNC. If you change the active BNC again, the menu selections will update to reflect the new BNC.

5. Change the **Type** for **BNC C10** to **Alpha** as follows:

• Press **1. Type**.

• Use the ⬇ and ⬆ buttons to select **Alpha**.

✓ **Operating Tip**

> **Alpha** — Select this option when an alpha signal (also known as a "Key" signal) is connected to the frame. Devices such as DVEs, Character Generators, Graphics (Paint) Systems, and Still Stores typically provide unique alpha signals.

• Press the right **SEL** button to accept the new settings.

```
Inputs
0. Input        BNC C10
1. Type         Video
2. AutoKey      Black
3. Shaped       No
4. Aud Chan1 None
5. Aud Chan2 None
6. Vid Format  720p 59.94




MENU   100          10     1      SEL
Exit   Previous    Down   Up     Accept
```

BNC C10 — Inputs Menu 2

• You have now set **BNC C10** up as an **Alpha**. Other configuration changes are made to this, and other menu items in the same manner as you have just performed. Now that you have finished configuring the BNC, you will want to exit the menu system.

6. Press **MENU** to display the **Installation Change Screen**. Whenever you change any of the switcher settings, you will be asked to confirm these changes when you exit the menu system. In this case, since we changed **BNC C10** to an **Alpha**, the switcher requires us to confirm this change.

```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm          1. Cancel






                   10     1      SEL
                  Down   Up     Accept
```

Installation Change Screen

7. Accept or cancel these changes as follows:

⚠️(✳)   **Important** | As this has been an example, you should press **1. Cancel** so as not to change the setting of your Synergy 100 MD switcher.

• Press **0. Confirm** to accept the changes.

• Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the example procedure for navigating to the **Inputs Menu** and setting up a particular BNC.

Help Features

A help feature is provided for convenient online assistance as you operate your Synergy 100 MD switcher.

Help Menu

The **Help Menu** provides a list of important "hidden" switcher functions. For example, you can access instructions to use the two-button **Copy Key** function.

When a function is selected, information about the requested function is displayed in the lower half of the menu screen.

Use the following procedure to access and browse the **Help Menu**:

1. Navigate to the **Help Menu** as follows:

    •   Press **MENU** to display the **Main Menu**.

    •   Press **9. Help Menu** to display the **Help Menu**.

```
Help Menu

                    Copy Key
                    Key Swap
                    Resetting the Switcher
                    Shift Buttons
                    Transition Preview

You can only copy key 1 onto key 2, except matte
fill color. Set up KEY 1, then press and hold the key
type button of KEY 1. Press KEY 2 Effects Keyers
group and release both buttons.

MENU    100         10      1       SEL
Exit    Previous    Down    Up      Accept
```
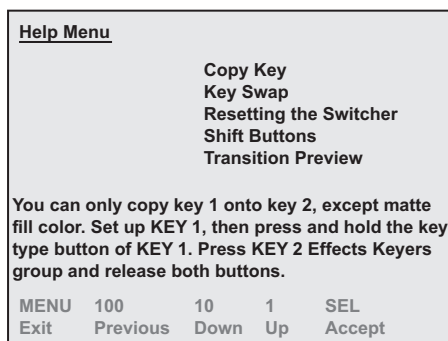
Help Menu

2. Use the ⬇ and ⬆ buttons to select a function, and view information about the function in the lower half of the menu screen.

This completes the procedure to access and browse the **Help Menu**.

Software Upgrades and Options

In This Chapter

This chapter provides instructions for upgrading system software, and verifying and installing various software options. The following topics are discussed:

- Network Setup

- Accessing the MD/X Web Interface

- Accessing the System Information

- Software Upgrade

- Changing the MD/X Web Interface Account

- Saving and Loading Setup Files

- Working with Port Monitor Files

- Notes on Using a USB Drive

- Installed Options

Network Setup

This section provides instructions for configuring your network setup for your Synergy 100 MD switcher software.

⍟	**Important**	Refer to the section "**Standard Network Security**" on page 20–2 for Ethernet security considerations.

Software upgrades are performed from a computer using the **LAN 1** Ethernet port on the rear of the Synergy 100 MD frame. Prior to performing the upgrade, it is necessary to configure the network setup for the switcher.

⍟	**Important**	If DIP Switch 1 on the frame CPU board is set to **ON**, the network IP address is forced to 192.168.1.1 and the netmask to 255.255.0.0. Network changes will still take effect but a warning message will be displayed and if you restart the switcher with DIP Switch 1 still **ON**, the network address will revert to 192.168.1.1 and the netmask to 255.255.0.0. Refer to the section "**Frame CPU Board (4800AR-001)**" on page 2-4 for more information.

Use the following procedure to configure the network setup of your switcher:

1. Ensure that the switcher is connected to your local network.

2. Navigate to the **Network Menu** as follows:

   • Press **MENU** to display the **Main Menu**.

   • Press **7. Options** to display the **Options Menu**.

   • Press **0. Network Setup** to display the **Network Setup Menu**.

```
Network Setup
0. IP Address          5. DHCP          Off
1. Subnet
2. Gateway
3. Primary DNS
4. Secondary DNS

   _____

   IP Address: XXX.XXX.XXX.XXX



Use Hue to select element, SAT to adjust value.
Exit menu and reboot for settings to take effect.
```

Network Setup Menu

3. Select the DHCP setting as follows:

   • Press **5. DHCP** to toggle DHCP **On** or **Off**.

      ~ **On** — Select **ON** to enable the DHCP. The network settings *cannot* be dialed up manually.

      ~ **Off** — Select **OFF** to disable the DHCP. You will have to specify the network settings manually.

✎	**Note**	If the **DHCP** option is **On**, the remaining setting are automatically configured. If the **DHCP** is **Off**, you will have to manually enter values into all the fields.

4. Press **0. IP Address** to display the **IP Address Menu**.

```
Network Setup
0. IP Address        5. DHCP        Off
1. Subnet
2. Gateway
3. Primary DNS
4. Secondary DNS
_____

   IP Address: XXX.XXX.XXX.XXX



Use Hue to select element, SAT to adjust value.
Exit menu and reboot for settings to take effect.
```

Network Setup — IP Address

5. Select the IP address as follows:
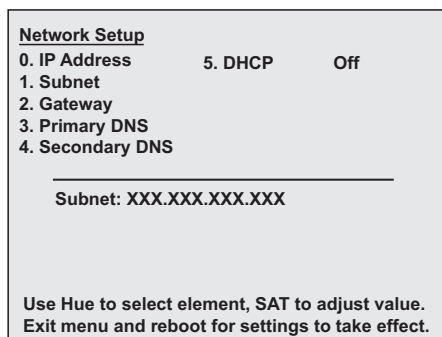
Note The Static IP Address should be assigned by your IT department, or the person that is managing your network so that there are no conflicts with other devices on the network.

• Move the Positioner **Left** or **Right** to select the segment you want to change.

• Move the Positioner **Up** or **Down** to select the value you want to enter into the selected segment.

6. Press **1. Subnet** to display the **Subnet Menu**.

```
Network Setup
0. IP Address        5. DHCP        Off
1. Subnet
2. Gateway
3. Primary DNS
4. Secondary DNS
_____

   Subnet: XXX.XXX.XXX.XXX



Use Hue to select element, SAT to adjust value.
Exit menu and reboot for settings to take effect.
```

Network Setup — Subnet Menu
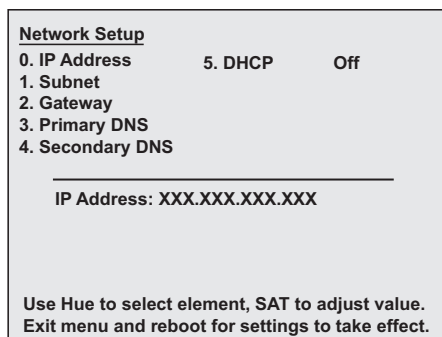
7. Select the Subnet Mask as follows:

• Move the Positioner **Left** or **Right** to select the segment you want to change.

• Move the Positioner **Up** or **Down** to select the value you want to enter into the selected segment.

8. Press **2. Gateway** to display the **Gateway Menu**.

```
Network Setup
0. IP Address        5. DHCP        Off
1. Subnet
2. Gateway
3. Primary DNS
4. Secondary DNS
_____
    Gateway: XXX.XXX.XXX.XXX



Use Hue to select element, SAT to adjust value.
Exit menu and reboot for settings to take effect.
```

Network Setup — Gateway Menu

9. Select the Gateway as follows:

    • Move the Positioner **Left** or **Right** to select the segment you want to change.

    • Move the Positioner **Up** or **Down** to select the value you want to enter into the selected segment.

10. Press **3. Primary DNS** to display the **Primary DNS Menu**.

```
Network Setup
0. IP Address        5. DHCP        Off
1. Subnet
2. Gateway
3. Primary DNS
4. Secondary DNS
_____
    Primary DNS: XXX.XXX.XXX.XXX



Use Hue to select element, SAT to adjust value.
Exit menu and reboot for settings to take effect.
```

Network Setup — Primary DNS Menu

11. Select the Primary DNS as follows:

    • Move the Positioner **Left** or **Right** to select the segment you want to change.

    • Move the Positioner **Up** or **Down** to select the value you want to enter into the selected segment.

12. Press **4. Secondary DNS** to display the **Secondary DNS Menu**.

```
Network Setup
0. IP Address        5. DHCP        Off
1. Subnet
2. Gateway
3. Primary DNS
4. Secondary DNS
_____
    Secondary DNS: XXX.XXX.XXX.XXX



Use Hue to select element, SAT to adjust value.
Exit menu and reboot for settings to take effect.
```

Network Setup — Secondary DNS Menu

13. Select the Secondary DNS as follows:

   • Move the Positioner **Left** or **Right** to select the segment you want to change.

   • Move the Positioner **Up** or **Down** to select the value you want to enter into the selected segment.

14. Press **MENU** to display the **Installation Change Screen**.

```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm              1. Cancel




                10      1      SEL
                Down    Up     Accept
```
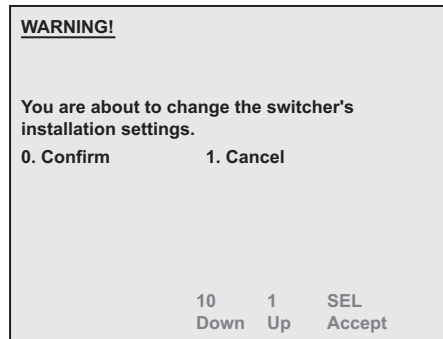
Installation Change Screen

15. Accept or cancel these changes as follows:

   • Press **Confirm** to accept the changes.

   • Press **Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for selecting the network settings for the switcher.

If you have previously configured your switcher, and wish to save these configurations, you will have to store these settings to a storage device, proceed with the upgrade, and then restore your settings.

Accessing the MD/X Web Interface

The **MD/X Web Interface** is included with the Synergy MD software. You use the MD/X Web Interface to obtain system information from your switcher, perform software upgrades, manage switcher file sets, and configure user access to the MD/X Web Interface.

Accessing the MD/X Web Interface

You access the MD/X Web Interface via a web browser on a computer that has network access to your Synergy 100 MD switcher.

Note | The current versions of Internet Explorer, Mozilla and Netscape are supported. If you have any problems, please contact Ross Video Technical support.

Before using the MD/X Web Interface, you need a user account. The MD/X Web Interface supports a single user name and password which can be changed from within the MD/X Web Interface. Refer to the section "**Changing the MD/X Web Interface Account**" on page 6-19 for information on creating and managing the user account.

Use the following procedure to access the MD/X Web Interface:

1. On your computer, open your Web Browser and, in the address bar, type in the IP address of your switcher to display the **MD/X Web Interface Splash Screen**.

Note | If your computer is not on the same network as your switcher or has no network route to that network, the MD/X Web Interface will not be available. Contact your IT department for assistance.

2. Wait a few seconds or click on the logo and the login window appears.

3. In the **Name** field enter the MD/X Web Interface user name.

4. In the **Password** field enter the password.

Note | If you do not know the user name or password contact your IT department or Ross Video Technical Support.

5. Click **OK** to start the MD/X Web Interface and display the **System Info Page**.

Card	Function	Slot	Version	Date	Status
Frame CPU Board	Linux	A	7.1.a	May30	Done
Control Panel CPU (S1)	Runtime	A	7.1.a		Done
Output Board	MSP	B	7.1.a	May30	Done
Output Board	Linux	B	7.1.a	May30	Done
Input Board (with Crosspoint)	MSP	C	7.1.a	May30	Done
Input Board (with Crosspoint)	FPGA	C	7.1.a	May30	Done
Input Board (with Crosspoint)	FPGA2	C	7.1.a	May30	Done
Output Board	MSP	D	7.1.a	May30	Done
Output Board	Linux	D	7.1.a	May30	Done
Video Processor Board	MSP	1	7.1.a	May30	Done
Video Processor Board	Linux	1	7.1.a	May30	Done
XFX DSP Cards	XFX_Boot	1	7.1.a	May 30	Done
XFX DSP Cards	XFX_Runtime	1	7.1.a	May 30	Done
XFX DSP Cards	XFX_Virtex_FPGA	1	7.1.a	May 30	Done
Squeeze & Tease Carrier	MSP	2	7.1.a	May30	Done
Squeeze & Tease Carrier	Linux	2	7.1.a	May30	Done
Squeeze & Tease DSP Cards	DSP_Boot	2	7.1.a	May 30	Done
Squeeze & Tease DSP Cards	DSP_Runtime	2	7.1.a	May 30	Done
Squeeze & Tease DSP Cards	DSP_FPGA	2	7.1.a	0103	Done
Squeeze & Tease DSP Cards	Channel_Card	2	7.1.a	0310	Done
Squeeze & Tease Warp Cards	WARP_FPGA	2	0.0.0		Done
Squeeze & Tease Warp Cards	Warp_Boot	2	0.0.0		Done
Squeeze & Tease Warp Cards	Warp_Runtime	2	0.0.0		Done
Fan Carrier (MD)	MSP	4	7.1.a	May30	Done

Storage Capacity

Usage of fixed storage space is as follows.

Device	Total Size	Current Usage	Remaining Capacity	Percent Used
Hard disk	105.7G	4.3G	100.3G	4%
System flash	32.0M	8.6M	23.4M	27%
Application flash	31.5M	22.1M	9.4M	70%

System Info Page

Use the menu at the top of the screen to access different MD/X Web Interface pages. Those pages are discussed in the following sections:

- **System Info** — For details on viewing system information, refer to the section "**Accessing the System Information**" on page 6-8.

- **Upgrade** — For details on upgrading your software, refer to the section "**Software Upgrade**" on page 6-10.

- **Admin** — For details on modifying system accounts, refer to the section "**Changing the MD/X Web Interface Account**" on page 6-19.

- **File Sets** — For details on accessing setup files, refer to the section "**Saving and Loading Setup Files**" on page 6-21.

Accessing the System Information

The **System Info Page** is the first page that is displayed after you log in to the MD/X Web Interface. It shows the status of every card installed in your switcher frame as well as information on hard drive and flash memory usage. Use the **System Info Page** during a software upgrade to monitor the progress of the upgrade or to obtain information about the installed cards and disk space in your switcher.

Accessing the System Information Page

Use the following procedure to access the **System Info Page**:

1. On your computer, open your Web Browser and, in the address bar, type in the IP address of your switcher to display the **Splash screen** and the **MD/X Web Interface Login** window.

2. In the **Name** field enter the MD/X Web Interface user name.

3. In the **Password** field enter the password.

> **Note** | If you do not know the user name or password contact your IT department or Ross Video Technical Support.

4. Click **OK** to start the MD/X Web Interface and display the **System Info Page**.

MD/X

| System Info | Upgrade | Admin | File Sets | | | | Help |

System Info

Installed cards and their versions are as follows.

Card	Function	Slot	Version	Date	Status
Frame CPU Board	Linux	A	7.1.a	May30	Done
Control Panel CPU (S1)	Runtime	A	7.1.a		Done
Output Board	MSP	B	7.1.a	May30	Done
Output Board	Linux	B	7.1.a	May30	Done
Input Board (with Crosspoint)	MSP	C	7.1.a	May30	Done
Input Board (with Crosspoint)	FPGA	C	7.1.a	May30	Done
Input Board (with Crosspoint)	FPGA2	C	7.1.a	May30	Done
Output Board	MSP	D	7.1.a	May30	Done
Output Board	Linux	D	7.1.a	May30	Done
Video Processor Board	MSP	1	7.1.a	May30	Done
Video Processor Board	Linux	1	7.1.a	May30	Done
XFX DSP Cards	XFX_Boot	1	7.1.a	May 30	Done
XFX DSP Cards	XFX_Runtime	1	7.1.a	May 30	Done
XFX DSP Cards	XFX_Virtex_FPGA	1	7.1.a	May 30	Done
Squeeze & Tease Carrier	MSP	2	7.1.a	May30	Done
Squeeze & Tease Carrier	Linux	2	7.1.a	May30	Done
Squeeze & Tease DSP Cards	DSP_Boot	2	7.1.a	May 30	Done
Squeeze & Tease DSP Cards	DSP_Runtime	2	7.1.a	May 30	Done
Squeeze & Tease DSP Cards	DSP_FPGA	2	7.1.a	0103	Done
Squeeze & Tease DSP Cards	Channel_Card	2	7.1.a	0310	Done
Squeeze & Tease Warp Cards	WARP_FPGA	2	0.0.0		Done
Squeeze & Tease Warp Cards	Warp_Boot	2	0.0.0		Done
Squeeze & Tease Warp Cards	Warp_Runtime	2	0.0.0		Done
Fan Carrier (MD)	MSP	4	7.1.a	May30	Done

Storage Capacity

Usage of fixed storage space is as follows.

Device	Total Size	Current Usage	Remaining Capacity	Percent Used
Hard disk	105.7G	4.3G	100.3G	4%
System flash	32.0M	8.6M	23.4M	27%
Application flash	31.5M	22.1M	9.4M	70%

System Info Page

> **Note** | The information listed on this page will be specific to your switcher and the boards and cards you have installed.

The **System Info Page** is divided into two sections:

- **System Info** – This section lists all the installed board and cards and their version and upgrade status (if applicable). Boards and Cards are presented in a table with the following columns:

  ~ **Card** – The name of the board or card.

  ~ **Func** – The type of board or card.

  ~ **Slot** – The switcher frame slot the board is installed in.

  ~ **Version** – The software version installed on the board (ideally, all boards should be running the same software version).

  ~ **Date** – The date of the software build installed on the board or card.

  ~ **Status** – The status should typically be reported as **Done**. During a software upgrade, the status of each board and card will change as the upgrade progresses. Refreshing the **System Info Page** allows you to monitor the upgrade.

- **Storage Capacity** – This section details the switcher hard drive and flash memory usage. Information is presented in a table with the following columns:

  ~ **Device** – The storage device being reported (either Hard disk, System flash, or Application flash).

  ~ **Total Size** – The total size of the hard disk or flash RAM. Hard disk size is reported in gigabytes and flash RAM storage is reported in megabytes.

  ~ **Current Usage** – The amount of memory currently being used on the storage device.

  ~ **Remaining Capacity** – The amount of memory still available for use.

  ~ **Percent Used** – The percentage of total storage space that is being used on the storage device.

This completes the procedure for accessing the **System Info Page**.

Software Upgrade

Software upgrades for your Synergy MD switcher are provided free of charge from Ross Video. Upgrading your switcher requires you to copy the upgrade file provided by Ross Video from your computer to your switcher and then initiate the upgrade process. You do this via the **Upgrade Page** of the MD/X Web Interface.

⚠	**Important**	Do not attempt to revert back to an older software version without contacting Ross Video Technical Support.

System Backup

Before starting a switcher software upgrade, it is good practice to back up your switcher setup. Switcher files such as memories, personality settings, and installation settings are stored in switcher setups. Each setup can contain a complete set of these switcher files that you can use to quickly store and recall different switcher configurations. You use the MD/X Web Interface to back up these setups from your switcher to your computer. The setups can then be restored to your Synergy 100 MD switcher at a later date.
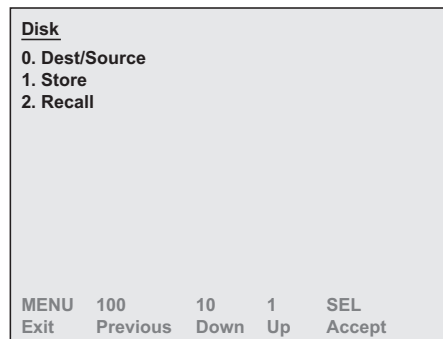
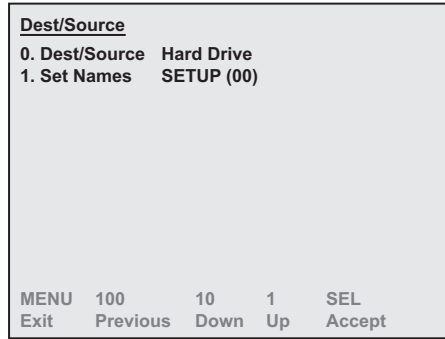| ⚠	**Important**	Because the software upgrade process *automatically* returns the switcher to *default* values, it is important that you back up all switcher elements to the hard drive at this point.

Use the following procedure to save your setup configurations:

1. Navigate to the **Disk Menu** as follows:

   • Press **MENU** to display the **Main Menu**.

   • Press **5. Disk** to display the **Disk Menu**.

```
Disk
0. Dest/Source
1. Store
2. Recall




MENU    100              10      1      SEL
Exit    Previous    Down    Up      Accept
```

Disk Menu

2. Press **0. Dest/Source** to display the **Dest/Source Menu**.

```
Dest/Source
0. Dest/Source   Hard Drive
1. Set Names     SETUP (00)




MENU    100       10    1    SEL
Exit    Previous  Down  Up   Accept
```
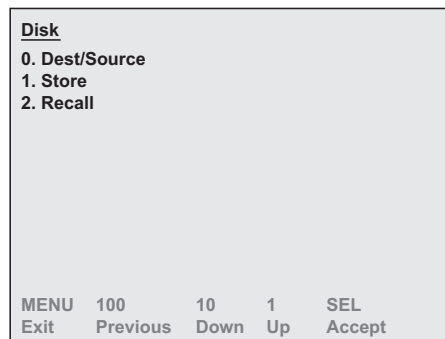
Dest/Source Menu

3. Select the storage device that you want to use to store the files as follows:

   • Press **0. Dest/Source**.

   • Use the ⬇ and ⬆ buttons to select the storage device you want to store the files to. You can select between the following:

      ~ **Hard Drive** — This option will allow you to store the files on the internal hard drive.

      ~ **USB** — This option will allow you to recall a file from a USB Drive. You must wait 5 seconds after inserting the USB Drive into the USB Port before you can save or recall files. Refer to the section "**Notes on Using a USB Drive**" on page 6-30 for further information.

   • Press the right **SEL** in the **System Control Group** to confirm the selection.

4. Select the Setup, or location, you want to store the files in as follows:

   • Press **1. Set Names**.

   • Use the ⬇ and ⬆ buttons to select the setup you want to store the files in.
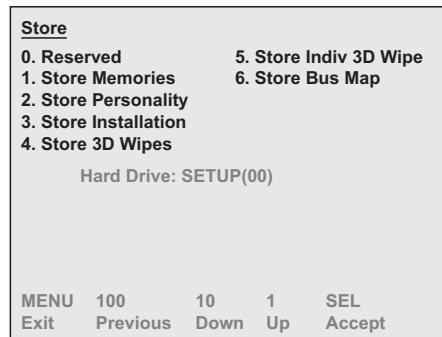
✎ **Note**   There are 100 setups available, from **00** through **99**, when you are storing files to the Hard Drive. You can only save one setup to a USB Drive.

   • Press the right **SEL** in the **System Control Group** to confirm the selection.

5. Press **BACK** to display the **Disk Menu**.

```
Disk
0. Dest/Source
1. Store
2. Recall




MENU    100       10    1    SEL
Exit    Previous  Down  Up   Accept
```

Disk Menu

6. Press **1. Store** to display the **Store Menu**.

```
Store

0. Reserved              5. Store Indiv 3D Wipe
1. Store Memories        6. Store Bus Map
2. Store Personality
3. Store Installation
4. Store 3D Wipes

        Hard Drive: SETUP(00)




MENU   100       10     1     SEL
Exit   Previous  Down   Up    Accept
```

Store Menu

| Note | Notice that the current storage device and setup are displayed, as well as whether there are any files in the selected Setup or not. |

7. Select the category of registers that you want to store as follows:

   • Press **1. Store Memories** to store only **Memory Registers**.

   • Press **2. Store Personality** to store only **Personality Registers**.

   • Press **3. Store Installation** to store only **Installation Registers**.

This completes the procedure for saving your setups to the hard drive. Now that the current settings have been stored, you can either copy your setups onto an external computer, or proceed to upgrade the switcher.
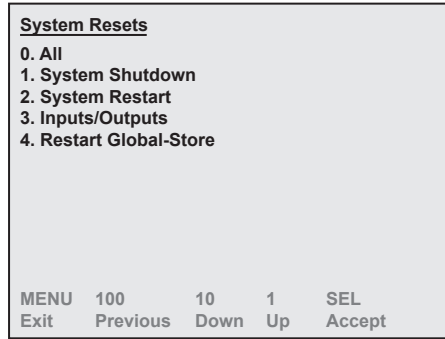
Upgrading the Switcher

A software upgrade affects many of the boards inside your Synergy 100 MD switcher. Since most of the boards are hot-swappable, it is necessary to constantly monitor which boards are plugged in, and make sure that their software and hardware versions are current and compatible with the rest of the system.

Restarting the Switcher Before an Upgrade

Before upgrading you switcher, you should reboot the switcher frame to ensure that all components are in a known state. You must also shut down the switcher control panel.
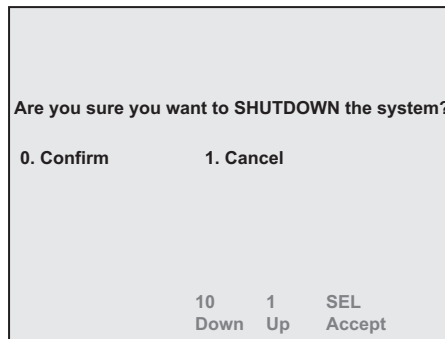
Use the following procedure to shutdown and restart the switcher before an upgrade is performed:

1. Navigate to the **Default Menu** as follows:

   • Press **MENU** to display the **Main Menu**.

   • Press **7. Options** to display the **Options Menu**.

   • Press **5. System Resets** to display the **System Resets Menu**.

```
System Resets

0. All
1. System Shutdown
2. System Restart
3. Inputs/Outputs
4. Restart Global-Store




MENU   100         10      1     SEL
Exit   Previous    Down    Up    Accept
```

System Resets Menu

2. Press **1. System Shutdown** to display the **System Shutdown Confirmation Screen**.

```



Are you sure you want to SHUTDOWN the system?

0. Confirm            1. Cancel




              10      1     SEL
              Down    Up    Accept
```

System Shutdown Confirmation Screen

3. Press **0. Confirm** to shut down the switcher.

⚠ **Caution** | Even though the switcher has been shut down, the power supplies are *still active* until they have been physically switched off.

4. Remove the front door of the frame. Refer to the section "**Removing and Installing the Frame Door**" on page 3-14 for details.

5. Locate the power supplies on the right side of the frame.

6. Toggle each of the power supply switches to **OFF** to power down the frame.

7. Wait about **6** seconds for the system to discharge any residual power.

8. Toggle the power switches on each power supply **ON** in order to power up the frame.

9. Allow the switcher to fully power up before attempting the upgrade. When the switcher is fully powered up, it will be able to pass video normally and, if you have the **Squeeze & Tease MD** option installed, you will be able to Fly a Key.

This completes the procedure for restarting the switcher before an upgrade. Next you will perform the upgrade.

Performing the Upgrade

	Important	Ensure that the switcher is fully powered up before attempting the upgrade.

Now that the switcher frame has been powered down and restarted, the upgrade can be performed:

1. On your computer, open your Web Browser and, in the address bar, type in the IP address of your switcher to display the **Splash screen** and the **MD/X Web Interface Login** window.

2. In the **Name** field enter the MD/X Web Interface user name.

3. In the **Password** field enter the password.

	Note	If you do not know the user name or password contact your IT department or Ross Video Technical Support.

4. Click **OK** to start MD/X Web Interface and display the **System Info Page**.

5. Ensure that all cards installed in your switcher frame appear in the list and that the **Status** column shows **Done** for each card.

6. Wait at least one minute and then refresh the **System Info Page** to ensure that all cards have appeared in the list.

7. Click **Upgrade** to display the **Upgrade Page**.

Upgrade Page

The **Upgrade Page** displays a list of software upgrade files that have been uploaded to your switcher. If the upgrade file you wish to use is included in this list, skip ahead to step 9, otherwise, proceed with the next step.

	Note	The **Name**, **Version**, and **Build Date** information listed is specific to your switcher and the software upgrade files you have copied to it.

8. Upload the software upgrade file to the switcher as follows:

- Enter a name for the new upgrade file in the bottom row of the **Name** column. This name will be used to identify this upgrade file so it is recommended that you use a descriptive name.

✎ **Note** | Only alphanumeric, - (dash), _ (underscore), and. (period) characters are permitted for upgrade file names.

- Click the **Browse** button and use the file requestor box to locate the upgrade file for the software version that you are upgrading to. The file will have the ***.tgz** file extension.
- Click the **Open** button in the file requestor and the path to the file you selected will be placed in the **Select file to upload** field.
- The switcher will verify that the file is a valid upgrade package. If not, you will receive an error message and be prompted to chose a valid upgrade package file.
- Select the **S100** option below the build list.

⚠ **Important** | Ensure the **Add Feature** check box in the **New Upgrade File** area is **unchecked** unless directed otherwise by Ross Video Technical Support.

9. Click the radio button next to the name of the upgrade file you wish to use for the upgrade (if you are uploading a new file, the radio button should already be selected).

✓ **Operating Tip** | You can delete an upgrade file that was previously uploaded by selecting it and then pressing the **Delete selected version** button.

10. Select the **S100** option below the build list.

⚠ **Important** | Ensure the **Add Feature** check box in the **New Upgrade File** area is **unchecked** unless directed otherwise by Ross Video Technical Support.

11. Click the **Upgrade selected version** button to commence the upgrade.

⚠ **Important** | You must wait until the software package has been uploaded and the upgrade page refreshed before proceeding with the upgrade.

12. The **Upgrade Successful Page** is displayed if the upgrade is completed successfully (it could take a few minutes for this page to display). If an **Error Screen** is displayed instead of the **Upgrade Successful Page** contact **Ross Video Technical Support**.
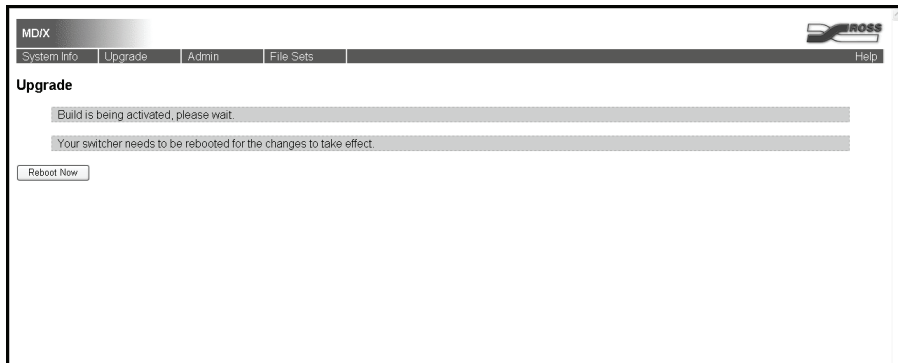
Upgrade Successful

13. The boards and cards in the switcher now need to be upgraded. The switcher will ask you to reboot the Synergy MD frame. Click the **Reboot Now** button to reboot the frame.

   Your switcher frame will reboot. During this time, it will be unavailable for use.

14. Click on the **System Info** button to monitor the progress of the reboot.

   As the reboot progresses, the various boards and cards will be upgraded and come back on-line. The boards and cards will appear in the list and their status will change as they are upgraded. Refresh the **System Info Page** to see more of the boards and cards as they become available. Once all cards have a status of **Done**, the software upgrade is complete.

Upgrade in Progress

| ✎ | **Note** | Some cards may appear and disappear from the **System Info Page** during the upgrade. Refresh the page a number of times to ensure that all cards finish upgrading. |

15. Allow the switcher to propagate the upgrade to all the boards and cards installed in the frame by waiting at least one minute after all cards have appeared on the **System Info Page**.

⚠ **Caution** | If the switcher has not finished propagating the upgrade before you proceed to shut-down the switcher, you may damage the switcher.

This completes the procedure for upgrading the software on the switcher. Next you will have to shut-down the switcher and power it back up in order to initialize the new software on all the boards and cards in the frame.

Restarting the Switcher After an Upgrade

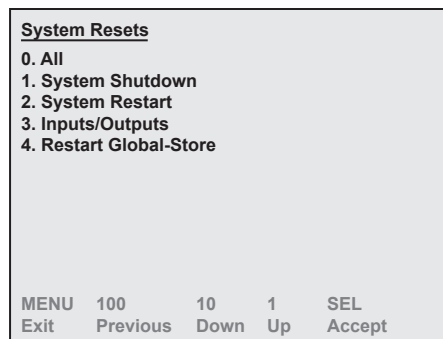The Synergy MD frame must now be restarted to have the software upgrade take effect.

⚠ **Caution** | If the switcher has not finished propagating the upgrade before you proceed to shut-down the switcher, you may damage the switcher.

Use the following procedure to shutdown and restart the switcher after an upgrade has been performed:

1. Navigate to the **Default Menu** as follows:

   • Press **MENU** to display the **Main Menu**.

   • Press **7. Options** to display the **Options Menu**.

   • Press **5. System Resets** to display the **System Resets Menu**.


```
System Resets

0. All
1. System Shutdown
2. System Restart
3. Inputs/Outputs
4. Restart Global-Store




MENU    100        10     1     SEL
Exit    Previous   Down   Up    Accept
```

System Resets Menu

2. Press **1. System Shutdown** to display the **System Shutdown Confirmation Screen**.


```
Are you sure you want to SHUTDOWN the system?

0. Confirm            1. Cancel




               10     1     SEL
               Down   Up    Accept
```
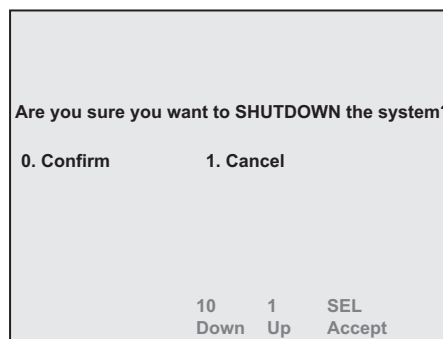
System Shutdown Confirmation Screen

3. Press **0. Confirm** to shut down the switcher.

4. Locate the power supplies on the right side of the frame.

5. Toggle each of the power supply switches to **OFF** to power down the frame.

6. Wait about **6** seconds for the system to discharge any residual power.

7. Toggle the power switches on each power supply **ON** in order to power up the frame.

8. Replace the front door of the frame

This completes the procedure for upgrading the switcher software. Next you will want to recall any setups you backed up. Refer to the section "**Restoring Setups from an External Computer**" on page 6-22 for more information.

Changing the MD/X Web Interface Account

Accessing MD/X Web Interface requires a user account. The Synergy MD software ships with a default user account:
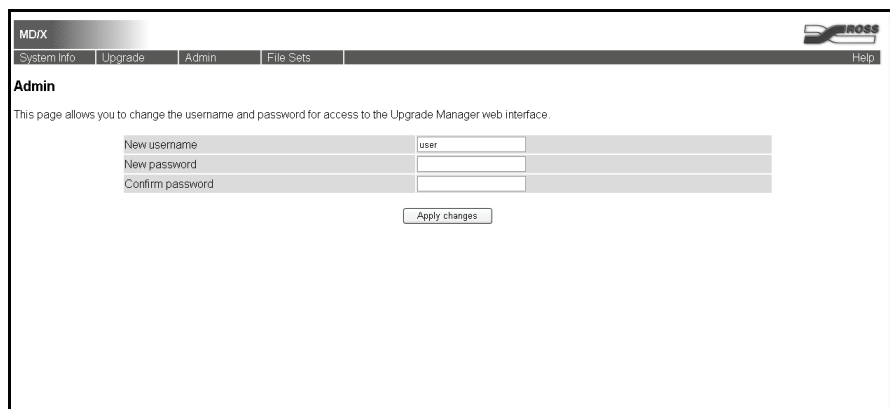
- User Name: **user**
- Password: **password**

For security reasons, you should change the user name and password as soon as possible. You may also wish to periodically change the user account to maintain secure access to your switcher.

Changing the Synergy MD/X Web Interface Account

Use the following procedure to change the MD/X Web Interface account:

1. On your computer, open your Web Browser and, in the address bar, type in the IP address of your switcher to display the **Splash screen** and the **MD/X Web Interface Login** window.

2. In the **Name** field enter the MD/X Web Interface user name (**user** if the default user account is still being used).

3. In the **Password** field enter the password (**password** if the default user account is still being used).

4. Click **OK** to start MD/X Web Interface and display the **System Info Page**.

5. Click **Admin** to display the **Admin Page**. This page allows you to change the user account.

Admin Page

6. If you wish to change the user name, click in the **New Username** field and then type the new user name. If you wish to leave the user name the same, leave this field blank.

7. If you wish to change the password, click in the **New Password** field and then type the new password. If you do not wish to change the password, leave this field blank.

8. If you are changing the password, click in the **Confirm Password** field and then re-type the new password that you used in step 7.

Note Only alphanumeric, - (dash), _ (underscore), and . (period) characters are permitted for user names and passwords.

---

9. Click the **Apply Changes** button to apply your new user name and password settings.

	Note	If you type different passwords in steps 7 and 8 above, you will receive an error message and the user account information will **not** change.

This completes the procedure for setting up and managing accounts.

Saving and Loading Setup Files

This section includes information on the following topics:

- Backing up Setups to an External Computer
- Restoring Setups from an External Computer
- Recalling Registers from a Storage Device
- Deleting Existing Setups

Backing up Setups to an External Computer

Switcher file sets can be copied onto an external computer for backup purposes (refer to the section "**Backing up Setups to an External Computer**" on page 6-21 for information on creating switcher file sets). You use the MD/X Web Interface to copy switcher file sets between your Synergy 100 MD switcher and your computer. Ensure that the switcher is powered on, and use the following procedure to initiate the software upgrade.

Use the following procedure to store your setups:

1. On your computer, open your Web Browser and, in the address bar, type in the IP address of your switcher to display the **Splash screen** and the **MD/X Web Interface Login window**.

2. In the **Name** field enter the MD/X Web Interface user name.

3. In the **Password** field enter the password.

✎ **Note** If you do not know the user name or password contact your IT department or Ross Video Technical Support.

4. Click **OK** to start MD/X Web Interface and display the **System Info Page**.

5. Click **File Sets** to display the **File Sets Page**.

File Sets Page

The numbers 00 - 99 correspond to the 100 setups that can be saved on your Synergy 100 MD switcher. Any of the setups that have been saved will be underlined and colored blue.

6. Click on the number of the setup that you wish to save to your computer.

7. When the save dialog box appears, click **Save** and then use the file requestor to save the setup to a location on your computer. The file will be saved as **set##.tar.gz**, where ## is the number of the setup you are saving.

Note When a Setup is downloaded from the switcher, it is compressed into a single file that contains all the switcher files that were stored in that setup location. You must use MD/X Web Interface to reload the file to the switcher.

This completes the procedure for storing a setup on your computer.

Restoring Setups from an External Computer

Switcher file sets that have been copied to an external computer can be uploaded back to the switcher. This is especially useful after you have performed a switcher software upgrade or replaced your switcher hard drive as your switcher will be in a default configuration. You can upload the setups that you stored on an external computer to the Synergy 100 MD switcher, and then recall the setups on the switcher.

Use the following procedure to upload a setup to your Synergy 100 MD switcher:

1. On your computer, open your Web Browser and, in the address bar, type in the IP address of your switcher to display the **Splash screen** and the **MD/X Web Interface Login Window**.

2. In the **Name** field enter the MD/X Web Interface user name.

3. In the **Password** field enter the password.

Note If you do not know the user name or password contact your IT department or Ross Video Technical Support.

4. Click **OK** to start MD/X Web Interface and display the **System Info Page**.

5. Click **File Sets** to display the **File Sets Page**.

File Sets Page

The numbers 00 - 99 correspond to the 100 setups that can be saved on your Synergy 100 MD switcher. Any of the setups that have been saved will be underlined and colored blue.

Important   Uploading to a location that has a currently saved setup will cause that setup to be overwritten.

6. Click in the **Number** field and enter the two-digit location (00-99) where you wish to upload the switcher setup.

7. Click the **Browse...** button and use the file requestor to select the setup file on your computer that you wish to upload to the switcher.

Important   The Setup file will be called **set##.tar.gz**, where ## is the number of the setup. Uploading any other file to the switcher may corrupt your setup location.

8. Click the **Open** button. The **Filename** field will contain the path to the setup file you just selected.

9. Click the **Upload set** button to upload the file to the switcher.

This completes the procedure for uploading a setup to the switcher. Next, you will have to recall the switcher files from the setup location.

Recalling Registers from a Storage Device

Use the following procedure to recall registers from a storage device:

1. Ensure that the new Synergy 100 MD software version is properly installed. If not, refer to the section "**Upgrading the Switcher**" on page 6-12 for more information.

2. Navigate to the **Disk Menu** as follows:

- Press **MENU** to display the **Main Menu**.
- Press **5. Disk** to display the **Disk Menu**.

```
Disk
0. Dest/Source
1. Store
2. Recall




MENU    100        10    1    SEL
Exit    Previous   Down  Up   Accept
```
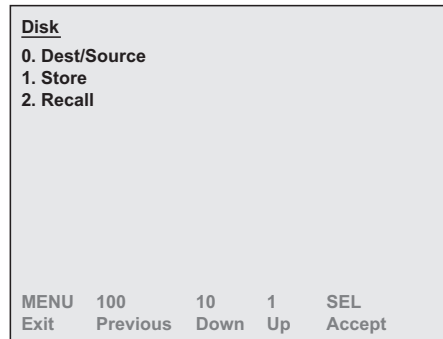
Disk Menu

3. Press **0. Dest/Source** to display the **Dest/Source Menu**.

```
Dest/Source
0. Dest/Source   Hard Drive
1. Set Names     SETUP (00)




MENU    100        10    1    SEL
Exit    Previous   Down  Up   Accept
```
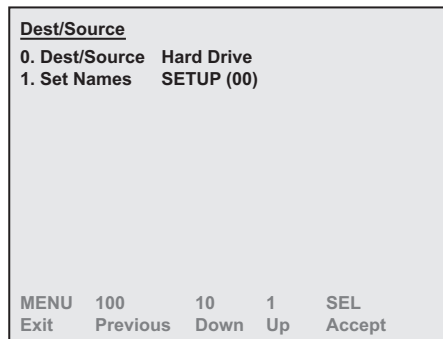
Dest/Source Menu

4. Select the storage device that you want to use to recall the files as follows:

- Press **0. Dest/Source**.
- Use the ⬇ and ⬆ buttons to select the storage device you want to recall the files from. You can select between the following:
  ~ **Hard Drive** — This option will allow you to recall the files from the internal hard drive.
  ~ **USB** — This option will allow you to recall a file from a USB Drive. You must wait 5 seconds after inserting the USB Drive into the USB Port before you can save or recall files. Refer to the section "**Notes on Using a USB Drive**" on page 6-30 for further information.
- Press the right **SEL** in the **System Control Group** to confirm the selection.

5. Select the Setup, or location, you want to recall the files from as follows:

- Press **1. Set Names**.
- Use the ⬇ and ⬆ buttons to select the setup you want to recall the files from.

✎ **Note** | There are 100 setups available, from **00** through **99**, when you are storing files to the Hard Drive. You can only save one setup to a USB Drive.

- Press the right **SEL** in the **System Control Group** to confirm the selection.

6. Press **BACK** to display the **Disk Menu**.

```
Disk
0. Dest/Source
1. Store
2. Recall




MENU    100      10    1    SEL
Exit    Previous Down  Up   Accept
```
Disk Menu
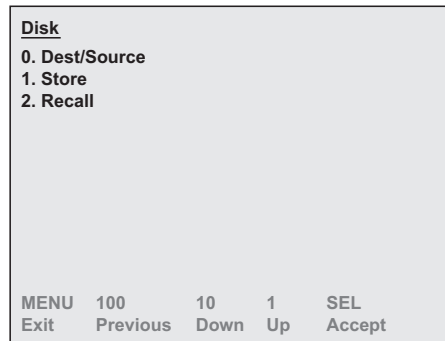
7. Press **2. Recall** to display the **Recall Menu**.
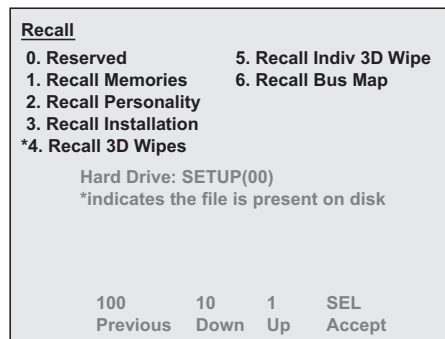
```
Recall
0. Reserved              5. Recall Indiv 3D Wipe
1. Recall Memories       6. Recall Bus Map
2. Recall Personality
3. Recall Installation
*4. Recall 3D Wipes
        Hard Drive: SETUP(00)
        *indicates the file is present on disk


        100      10    1    SEL
        Previous Down  Up   Accept
```
Recall Menu

Note   Notice that the current storage device and setup are displayed, as well as whether there are any files in the selected Setup or not.

8. Select the category of registers that you want to recall.

9. Confirm the recall of the selected category of registers from a storage device or cancel the procedure as follows:

   • Press **0. Yes** to recall the selected category of registers.

   • Press **1. No** to exit the menus, without making any changes. The system returns to the previously stored settings.

This completes the procedure for recalling your setups from a storage device.

Deleting Existing Setups

Switcher file sets that have been copied to an external computer can be deleted to allow for more storage space for newer setups.

Use the following procedure to delete an existing setup on an external computer:

1. On your computer, open your Web Browser and, in the address bar, type in the IP address of your switcher to display the **Splash screen** and the **MD/X Web Interface Login Window**.

2. In the **Name** field enter the MD/X Web Interface user name.

3. In the **Password** field enter the password.

✎ **Note** | If you do not know the user name or password contact your IT department or Ross Video Technical Support.

4. Click **OK** to start MD/X Web Interface and display the **System Info Page**.

5. Click **File Sets** to display the **File Sets Page**.

File Sets Page

The setup names and numbers in parentheses (00 - 99) correspond to the 100 setups that can be saved on your Synergy 100 MD switcher. Any of the setups that have been saved will be underlined and colored blue.

6. In the **Delete Sets** area, select the set you wish to delete using the drop-down list provided.

7. Click **Delete Set**.

8. Click **OK** in the confirmation dialog.

The setup is now deleted from the **File Sets** list.

This completes the procedure to delete an existing setup on an external computer.

Working with Port Monitor Files

✎ **Note** | Port Monitor files are used primarily for troubleshooting and diagnostic purposes. Therefore, you should not need to use this interface unless directed by Ross Video Technical Support.

The **TX/RX Test Menu** allows you to test communications with various remote control and communications ports. This data is stored to a file on the switcher hard drive, and may be retrieved via the Synergy MD/X Web Interface.

Each port will have a corresponding file for control panel and frame ports, named as follows:

- *pan##rx.txt* or *pan##tx.txt* for control panel ports
- **frm##rx.txt** or *frm##rx.txt* for frame ports

Refer to the section "**Communication Port Monitoring**" on page 12-9 for information on how to configure your switcher to stream data into a port monitor file.

Opening the Port Monitor File Browser

Use the following procedure to access the Web Interface for Port Monitor files:

1. On your computer, open your Web Browser and, in the address bar, type in the IP address of your switcher, with the addition of /cgi-bin/pmbroswer to display the **Splash screen** and the **MD/X Web Interface Login Window**.

   For example, enter *10.0.2.200/cgi-bin/pmbrowser*.

2. In the **Name** field enter the MD/X Web Interface user name.

3. In the **Password** field enter the password.

✎ **Note** | If you do not know the user name or password, contact your IT department or Ross Video Technical Support.

4. Click **OK** to start MD/X Web Interface and display the **Port Monitor File Browser**.

MD/X

System Info | Upgrade | Admin | File Sets | Help
Port Monitor Files

Port Monitor File Browser

File name	Action	
frm01rx.txt	Delete	
frm01tx.txt	Delete	
frm04rx.txt	Delete	
frm04tx.txt	Delete	
pan04rx.txt	Delete	
pan04tx.txt	Delete	
pan06rx.txt	Delete	
pan06tx.txt	Delete	

Port Monitor File Browser

This completes the procedure to access the Web Interface for Port Monitor files. Next, you will view port monitor files within the web interface.

Viewing a Port Monitor File

Note | Port Monitor files cannot be copied and saved from the Web Interface. To save a local copy, copy and paste the content of the Port Monitor file into a text editor.

Port Monitor files can be viewed directly from the Web Interface via the **Port Monitor File Browser**.

Use the following procedure to view a port monitor file:

1. In the **Port Monitor File Browser**, click on the port monitor file you wish to open.

    The Port Monitor file is displayed in the Web Interface.

MD/X

System Info | Upgrade | Admin | File Sets | Help
Port Monitor Files
File name : pan04tx.txt

```
0x000 : 4c 46 46 46 46 46 30 30 33 0d 4c 46 46 46 46
0x010 : 46 46 30 30 31 0d 4c 46 46 46 46 46 30 30 38
0x020 : 0d 52 46 46 46 46 46 30 30 31 0d 52 46 46 46
0x030 : 46 46 46 30 30 32 0d 52 46 46 46 46 46 30 30
0x040 : 33 0d 4c 46 46 46 46 46 30 30 36 0d 4c 46 46
0x050 : 46 46 46 30 30 34 0d 52 46 46 46 46 46 46 30
0x060 : 30 37 0d 52 46 46 46 46 46 30 30 38 0d 52 46
0x070 : 46 46 46 46 46 30 30 39 0d
```

Port Monitor File Example

2. Click **Port Monitor Files** to return to the **Port Monitor File Browser** and choose another port monitor file to view.

This completes the procedure to view a port monitor file.

Deleting Port Monitor Files

Note Stopping and restarting the streaming process will overwrite the existing port monitor files.

Port Monitor files may be deleted from the Web Interface.

Use the following procedure to delete a port monitor file from the **Port Monitor File Browser**.

1. On your computer, open your Web Browser and, in the address bar, type in the IP address of your switcher, with the addition of /cgi-bin/pmbroswer to display the **Splash screen** and the **MD/X Web Interface Login Window**.

    For example, enter *10.0.2.200/cgi-bin/pmbrowser*.

2. In the **Name** field enter the MD/X Web Interface user name.

3. In the **Password** field enter the password.

Note If you do not know the user name or password, contact your IT department or Ross Video Technical Support.

4. Click **OK** to start MD/X Web Interface and display the **Port Monitor File Browser**.

5. Click **Delete** beside the port monitor file you wish to delete.

6. Click **OK** in the confirmation dialog that displays.

    The port monitor file is deleted from the **Port Monitor File Browser**.

This completes the procedure to delete a port monitor file from the **Port Monitor File Browser**.

Notes on Using a USB Drive

The USB Port enables you to store and recall complete switcher setups including memory functions, switcher personalities, installation registers, and more, to a USB Drive.

Consider the following when using a USB Drive:

- You can only store one setup to a USB Drive using the method described in the section, "**Saving and Loading Setup Files**" on page 6-21. If you wish to store more than one, you must do so using a computer.

Important   A decrease in performance will result from storing more than one set of Synergy files on your USB Drive.

- Write protect should be disabled on any USB Drive.

- All Synergy files must be stored in the Root directory of the USB Drive.

- Only DOS or Windows™ partitions in the USB Drive directory are supported.

- You must wait 5 seconds after inserting the USB Drive into the USB Port before you can save or recall files.

- A delay can be expected when saving files to a USB Drive with more than half of the available memory allocated.

Installed Options

The following procedures enable you to navigate through the various Installed Options menus on the Synergy 100 MD control panel. Use the information provided in these menus to verify which options are currently installed on your frame and panel boards.

The following topics are discussed in this section:

- Accessing the Options Menu
- Installing Software Options
- Removing Software Options

⚠ **Important**

> Serial numbers allow Ross Video to properly track which options have been purchased by each customer. Serial numbers are installed in flash memory at the factory.

Accessing the Options Menu

The **Options Menu** allows you to verify all of the software options present in your Synergy 100 MD switcher. The menus also display the serial number, allow you to install additional software options, and store and recall option codes.

The following information is displayed on the **Options Menu**:

- **Panel ID** — This is the version number of the control panel CPU Board.
- **Panel SW** — This is the version of the software on the control panel.
- **Frame ID** — This is the version number of the frame CPU Board.

Accessing the Options Menu

Use the following procedure to display the **Options Menu**:

1. Press **MENU** to display the **Main Menu**.

2. Press **7. Options** to display the **Options Menu**.

```
Options S/N:XXXXXXXXXX

0. Network Setup              5. System Resets
1. Software Options
2. Panel ID          XXXX-X
3. Panel SW          X.X
4. Frame ID          XXXX-X




MENU    100       10     1      SEL
Exit    Previous  Down   Up     Accept
```
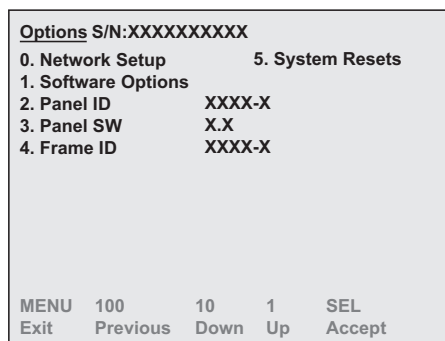
Options Menu

This completes the procedure for displaying the **Options Menu**.

Installing Software Options

Use the following procedure to activate your software options (after entering a new serial number) or to install a new software option that you have just purchased:

1. Navigate to the **Software Options Menu** as follows:

   - Press **MENU** to display the **Main Menu**.

   - Press **7. Options** to display the **Options Menu**.

   - Press **1. Software Options** to display the **Software Options Menu**.

```
Software Options - S/N:XXXXXXXXXX
0. List
1. Add
2. Remove




MENU    100        10     1     SEL
Exit    Previous   Down   Up    Accept
```
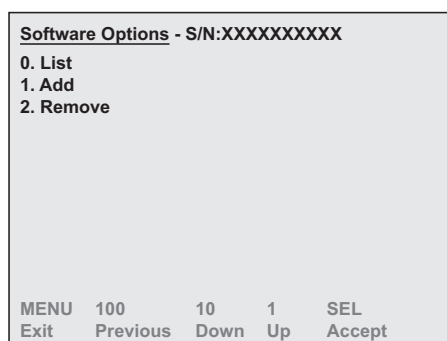
Software Options Menu

The following options are shown:

- **0. List** — Enables you to browse all currently enabled options. These options are listed down the right side of the **Software Options Menu**.

- **1. Add** — Enables you to add a new option

- **2. Remove** — Enables you to browse all currently enabled options and remove the option.

2. Call **Ross Video Technical Support** to obtain the software option code for the option you want to install. Ross Video Technical Support requires the following information:

   - Your name.

   - The name of the facility that the switcher is installed in.

   - The serial number of the switcher you want to install the option on.

   - The name of the options you want to install on the switcher.

✎ **Note** | Technical Support keeps an up-to-date record of the configuration and option status of each switcher.

3. You will be given a **5**-digit numeric code that must be entered in the **Add** field.

4. Enter the option code into the switcher as follows:

⚠ **Important** | You must enter all **5** characters, including any leading zeros.

   - Press **1. Add** to enter the encrypt code. The option code entry field will appear as **00000**.

   - Use the ⬇ and ⬆ buttons to enter the first character of the option code.

   - Press the right **SEL** button to select the next character.

- Use the ⬇ and ⬆ buttons to enter the second character of the option code.
- Continue until the option code has been entered.

| ✎ | **Note** | When you press **SEL**, after entering the fifth character, the switcher will add the option and the **Off** next to the option will change to **On**. |

This completes the procedure for installing the new software option.

Removing Software Options

Use the following procedure to remove software options:

1. Navigate to the **Software Options Menu** as follows:
   - Press **MENU** to display the **Main Menu**.
   - Press **7. Options** to display the **Options Menu**.
   - Press **1. Software Options** to display the **Software Options Menu**.

```
Software Options - S/N:XXXXXXXXXX
0. List
1. Add
2. Remove




MENU    100         10      1     SEL
Exit    Previous    Down    Up    Accept
```
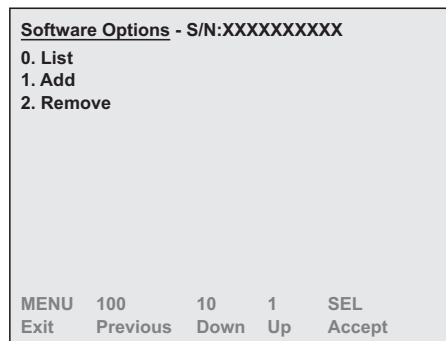
Software Options Menu

2. Press **2. Remove**.
3. Use the ⬇ and ⬆ buttons to scroll the list of installed options.
4. Press the right **SEL** button to select the option you wish to remove.
5. Press **0. Yes** in the **Warning Menu** to remove the software option from your system.

```
WARNING!

This will clear the option "Editor Interface".
Are you sure?

    0. Yes                  1. No




                10      1     SEL
                Down    Up    Accept
```
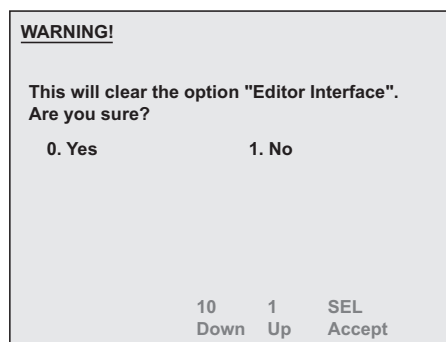
Warning Menu Example

This completes the procedure for removing a software option.

BNC Configuration and Check

In This Chapter

This chapter provides instructions for configuring and checking your BNC inputs. As you follow each procedure, you are in effect building a *database* that is used by the switcher to provide the desired names, sources, Key and fill associations and overall input functionality.

The following topics will be discussed:

- BNC Configuration Menu Tree
- BNC Configuration
- Setting Up BNC Types
- Setting Up Tallies
- Setting Up Auto Keys
- Setting Up Panel Buttons
- Assigning Audio Channels
- Checking BNC Inputs
- Checking Keys

BNC Configuration Menu Tree

The following figure shows the menu tree that is used to set up and configure your BNC inputs.

Main Menu - Synergy 100   vSynergy X MD-S100

0. Effects	5. Disk
1. Inputs	6. Personality
2. Outputs	7. Options
3. GPIs	8. S&T MD
4. Communication	9. Help Menu

MENU 100   10   1   SEL
Exit Previous Down Up Accept

Inputs

0. Inputs
1. Panel
2. Tally
3. Audio
4. Reference

MENU 100   10   1   SEL
Exit Previous Down Up Accept

Inputs

0. Input	BNC C01
1. Type	Off
2. AutoKey	Black
3. Shaped	No
4. Aud Chan1	Chan 1
5. Aud Chan2	Chan 2
6. Vid Format	720p 59.94

MENU 100   10   1   SEL
Exit Previous Down Up Accept

- BNC C01 - C16
- Global-Store 1 - 3

- Off
- Video
- Alpha

- Black
- BNC C01 - C16
- Global-Store 1 - 3

- Yes/No

- None
- Channel 1 - 16
- Group 1 - 6

• 480i	• 720p 25	• 1080p 24
• 480i 16:9	• 720p 24	• 1080p 23.98
• 576i	• 720p 23.98	• 1080pSF 30
• 576i 16:9	• 1080i 60	• 1080pSF 29.97
• 720p 60	• 1080i 59.94	• 1080pSF 25
• 720p 59.94	• 1080i 50	• 1080pSF 24
• 720p 50	• 1080p 30	• 1080pSF 23.98
• 720p 30	• 1080p 29.97	
• 720p 29.97	• 1080p 25	

Panel

0. Button	1
1. Input	Black

MENU 100   10   1   SEL
Exit Previous Down Up Accept

- 1 - 10
- SHIFT 1 - 10

- None
- BKGD
- Black
- Shift
- RevShift
- Global-Store 1 - 3
- BNC C01 - D16

Tally

0. Tally	Panel 1
1. Input	BNC C01
2. Type	On Air

MENU 100   10   1   SEL
Exit Previous Down Up Accept

- Panel 1 - 16

- None
- BNC C01 - C16
- Global-Store 1 - 3

- Off
- On Air
- Preview
- Aux 0 - 9

Audio

0. Channel	Chan 1
1. Level	75%
2. Groups	

MENU 100   10   1   SEL
Exit Previous Down Up Accept

- Chan 1 - 16

- 0% - 100%

Groups

0. Group	Group 1
1. Channel 1	None
2. Channel 2	Chan 15
3. Channel 3	Chan 9

MENU 100   10   1   SEL
Exit Previous Down Up Accept

- Group 1 - 6

- None
- Channel 1 - 16

- None
- Channel 1 - 16

- None
- Channel 1 - 16

Reference

0. Ref Format	720p 59.94
1. Input Ref	Board C
2. Video Format	720p 59.95
3. Reference	Int

Format: 720p 59.94
60 frames/sec
Scan Type: Progressive
Full Frame Res: 1650×750
Active Video: 1280×720
Switching Line: 7
Pixel Aspect Ratio: 1.00

MENU 100   10   1   SEL
Exit Previous Down Up Accept

• 480i	• 1080i 59.94
• 480i 16:9	• 1080i 50
• 576i	• 1080pSF 24
• 576i 16:9	• 1080pSF 23.98
• 720p 50	• 1080p 24
• 720p 59.94	

- Board C

• 480i	• 1080i 59.94
• 480i 16:9	• 1080i 50
• 576i	• 1080pSF 24
• 576i 16:9	• 1080pSF 23.98
• 720p 50	• 1080p 24
• 720p 59.94	

- Int
- Ext

BNC Configuration Menu Tree

BNC Configuration

In Chapter 4, you connected your physical inputs, including reference, primary inputs, and alpha inputs. In this section, you will *configure* each physical BNC input using the **Inputs Menu** on the **Preview Overlay**.

	Note	Before you begin, ensure that you have completed your **Input Worksheet**. Refer to the section "**Input Worksheet**" on page 4–11 for instructions.

Setting Up BNC Types

The **Inputs Menu** allows you to associate physical BNC connectors with input *types*. These associations play important roles throughout the system, particularly with regard to *filtering* subsequent BNC setup menus based on specific input types.

	Note	During the procedure, refer to the **Input Type** column in your **Input Worksheet**. These "types" will be entered on the **BNC Type Menu** for each input connected to the frame.

Use the following procedure to set your input types:

1. Navigate to the **Inputs Menu** as follows:

    - Press **MENU** to display the **Main Menu**.

    - Press **1. Inputs** to display the **Inputs Menu 1**.

    ```
    Inputs
    0. Inputs
    1. Panel
    2. Tally
    3. Audio
    4. Reference




    MENU    100       10     1    SEL
    Exit    Previous  Down   Up   Accept
    ```
    Inputs Menu 1

2. Press **0. Inputs** to display the **Inputs Menu 2**.

    ```
    Inputs
    0. Input      BNC C01
    1. Type       Off
    2. AutoKey    Black
    3. Shaped     No
    4. Aud Chan1 Chan 1
    5. Aud Chan2 Chan 2
    6. Vid Format 1080i 59.94



    MENU    100       10     1    SEL
    Exit    Previous  Down   Up   Accept
    ```
    Inputs Menu 2

3. Select the Input BNC you want to set up as follows:

   • Press **0. Input**.

   • Use the ⬇ and ⬆ buttons to select the input BNC you want to set up.

   • Press the right **SEL** button to accept the new settings.

4. Select the input type you want to assign to the selected input BNC as follows:

   • Press **1. Type**.

   • Use the ⬇ and ⬆ buttons to select the input type. You can choose between the following:

     ~ **Off** — Select this option when there is *no input* physically connected to the associated BNC. Selecting **Off** filters the input out of subsequent menus and eliminates menu "clutter."

     ~ **Video** — Select this option for all other video inputs that are not listed, such as cameras, routing switcher feeds, the fill portion of still stores or DVEs and other devices that provide both FILL and KEY sources.

     ~ **Alpha** — Select this option when an alpha signal (also known as a "Key" signal) is connected to the frame. Devices such as DVEs, Character Generators, Graphics (Paint) Systems, and Still Stores typically provide unique alpha signals.

   • Press the right **SEL** button to accept the new settings.

5. Select the video format of the input video of the associated BNC as follows:

Note | Internally generates signals, such as Global-Stores, cannot be set to a different video format than the switcher.

   • Press **6. Vid Format**.

   • Use the ⬇ and ⬆ buttons to select the input video format for the BNC. You can choose between the following:

Note | Assigning a **Video Format** to an **Input BNC**, that is different than the native video format that the switcher is operating in, can only be used for passing non-native video formats out an **Aux Bus**.
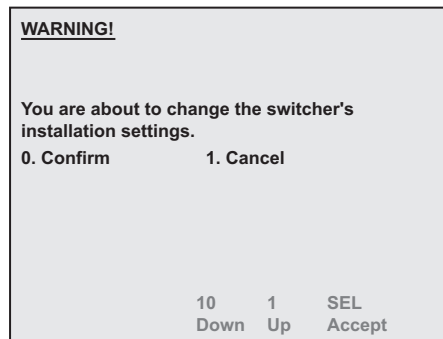
Note | Not all video formats are currently available.

~ 480i	~ 720p 25Hz	~ 1080p 24Hz
~ 480i 16:9	~ 720p 24Hz	~ 1080p 23.98Hz
~ 576i	~ 720p 23.98Hz	~ 1080pSF 30Hz
~ 576i 16:9	~ 1080i 60Hz	~ 1080pSF 29.97Hz
~ 720p 60Hz	~ 1080i 59.94Hz	~ 1080pSF 25Hz
~ 720p 59.94Hz	~ 1080i 50Hz	~ 1080pSF 24Hz
~ 720p 50Hz	~ 1080p 30Hz	~ 1080pSF 23.98Hz
~ 720p 30Hz	~ 1080p 29.97Hz	
~ 720p 29.97Hz	~ 1080p 25Hz	

   • Press the right **SEL** button to accept the new settings.

6. Press **MENU** to display the **Installation Change Screen**.

```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm          1. Cancel




                    10    1    SEL
                    Down  Up   Accept
```

Installation Change Screen

7. Accept or cancel these changes as follows:

   • Press **0. Confirm** to accept the changes.

   • Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for setting up the BNC Types.

Setting Up Tallies

The **Tally Menu** allows you to select the tally relays that will be activated when control panel buttons are pressed. Your associations on this menu affect the tally connectors (and associated relay electronics) on the control panel.

Note   During this procedure, refer to the **Tally Number** column in your **Input Worksheet**. These numbers will be entered on the **Tally Setup Menu** for each input connected to the frame.

Use the following procedure to set up your tallies:

1. Navigate to the **Inputs Menu** as follows:

   • Press **MENU** to display the **Main Menu**.

   • Press **1. Inputs** to display the **Inputs Menu**.

```
Inputs
0. Inputs
1. Panel
2. Tally
3. Audio
4. Reference




MENU   100        10    1    SEL
Exit   Previous   Down  Up   Accept
```
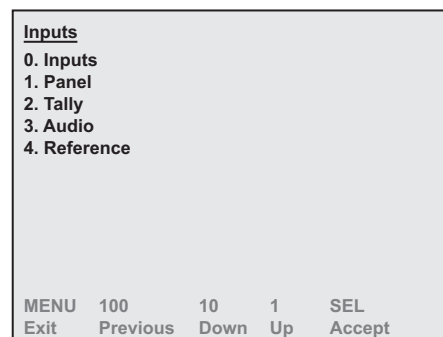
Inputs Menu 1

2. Press **2. Tally** to display the **Tally Menu**.

```
Tally
0. Tally      1
1. Input      BNC C01
2. Type       On Air




MENU    100       10     1     SEL
Exit    Previous  Down   Up    Accept
```

Tally Menu

3. Select the Tally you want to assign as follows:

   • Press **0. Tally**.

   • Use the ⬇ and ⬆ buttons to select the tally you want to assign to the input BNC or Global-Store channel.

   • Press the right **SEL** button to accept the new settings.

4. Select the Input BNC or Global-Store channel you want to assign to the selected tally as follows:

   • Press **1. Input**.

   • Use the ⬇ and ⬆ buttons to select the input BNC or Global-Store channel that you want to assign to the selected tally.

Note

The Synergy 100 MD Switcher has **16** panel tallies.

   • Press the right **SEL** button to accept the new settings.

5. Select the type of tally you want to assign as follows:

   • Press **2. Type**.

   • Use the ⬇ and ⬆ buttons to select the type of tally you want to assign. You can select between the following:

     ~ **Off** — Select this option to not assign a tally to the input BNC or Global-Store channel.

     ~ **On Air** — Select this option to have the selected BNC or Global-Store channel tallied when it is part of the Program Output of the switcher.

     ~ **Preview** — Select this option to have the selected BNC or Global-Store channel tallied when it is part of the Preview Output of the switcher.

     ~ **Aux** — Select **Aux 0** through **9** to have the selected BNC or Global-Store channel tallied when it is part of the output of that Aux Bus.

   • Press the right **SEL** button to accept the new settings.

6. Press **MENU** to display the **Installation Change Screen**.

```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm          1. Cancel




                    10     1     SEL
                    Down   Up    Accept
```
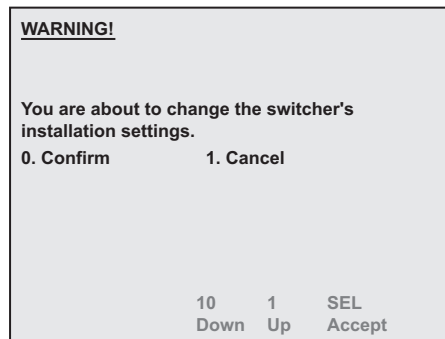
Installation Change Screen

7. Accept or cancel these changes as follows:

   • Press **0. Confirm** to accept the changes.

   • Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for setting up tallies.

Setting Up Auto Keys

The **Input Menu** allows you to select the specific Keying mode for the selected alpha (Key) signal. These mode selections determine how the Key is processed electronically, and how it appears *visually*. You can then associate an alpha (Key) signals with a primary (fill) video input (e.g., associating **CG Fill** with **CG Alpha**). This association simplifies the Keying process on the switcher. When you punch up a Key source on the Key bus, its alpha and fill are automatically selected.

Use the following procedure to set up your alpha inputs:

1. Navigate to the **Inputs Menu** as follows:

   • Press **MENU** to display the **Main Menu**.

   • Press **1. Inputs** to display the **Inputs Menu 1**.

```
Inputs
0. Inputs
1. Panel
2. Tally
3. Audio
4. Reference




MENU   100        10     1     SEL
Exit   Previous   Down   Up    Accept
```

Inputs Menu 1

2. Press **0. Inputs** to display the **Inputs Menu 2**.

```
Inputs
0. Input        BNC C01
1. Type         Off
2. AutoKey      Black
3. Shaped       No
4. Aud Chan1 Chan 1
5. Aud Chan2 Chan 2
6. Vid Format 1080i 59.94




MENU   100        10     1      SEL
Exit   Previous   Down   Up     Accept
```
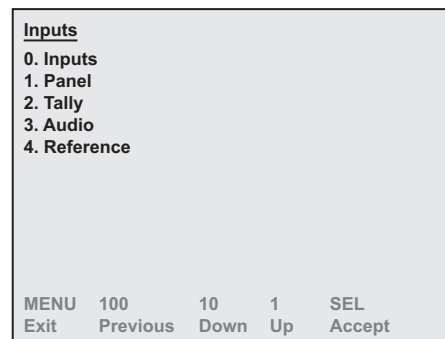
Inputs Menu 2

3. Select the input BNC you want to assign an alpha to as follows:

    •   Press **0. Input**.

    •   Use the ⬇ and ⬆ buttons to select the input BNC to want to assign an alpha to.

    •   Press the right **SEL** button to accept the new settings.

4. Assign an alpha to the selected input BNC as follows:

    •   Press **2. AutoKey**.

    •   Use the ⬇ and ⬆ buttons to select alpha you want to assign to the input BNC.

    •   Press the right **SEL** button to accept the new settings.

5. Assign a Keying mode to the select Auto Select Key as follows:

    •   Press **4. Shaped**.

    •   Press the right **SEL** button to select whether the AutoKey is **Shaped** (**Yes**) or **Unshaped** (**No**).

        ~   **Yes (Shaped)** — Select this option to have the switcher perform an *additive key*. Here, the fill video signal is precisely shaped (for example, characters, in the case of some **CG**s). The fill video signal, in turn, is matched *perfectly* by the alpha signal.

        ~   **No (unshaped)** — Select this option to have the switcher perform a *multiplicative key*. Here, the fill video signal is typically full screen, and the key (alpha) signal simply drops in — cutting a clean hole in the background.

6. Select the video format of the input video of the associated BNC as follows:

> **Note**
>
> Internally generates signals, such as Global-Stores, cannot be set to a different video format than the switcher.

    •   Press **6. Vid Format**.
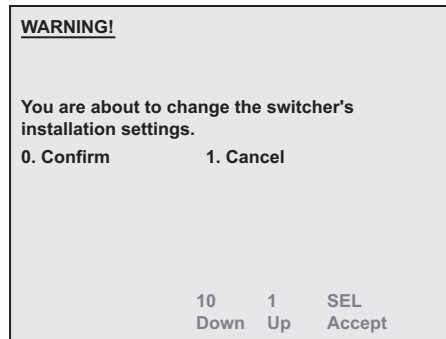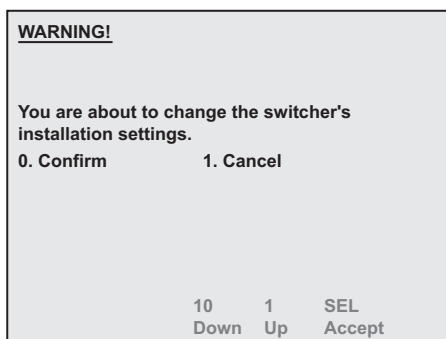
> **Note**
>
> Assigning a **Video Format** to an **Input BNC**, that is different than the native video format that the switcher is operating in, can only be used for passing non-native video formats out an **Aux Bus**.

- Use the ⬇ and ⬆ buttons to select the input video format for the BNC. You can choose between the following:

~ 480i	~ 720p 25Hz	~ 1080p 24Hz
~ 480i 16:9	~ 720p 24Hz	~ 1080p 23.98Hz
~ 576i	~ 720p 23.98Hz	~ 1080pSF 30Hz
~ 576i 16:9	~ 1080i 60Hz	~ 1080pSF 29.97Hz
~ 720p 60Hz	~ 1080i 59.94Hz	~ 1080pSF 25Hz
~ 720p 59.94Hz	~ 1080i 50Hz	~ 1080pSF 24Hz
~ 720p 50Hz	~ 1080p 30Hz	~ 1080pSF 23.98Hz
~ 720p 30Hz	~ 1080p 29.97Hz	
~ 720p 29.97Hz	~ 1080p 25Hz	

- Press the right **SEL** button to accept the new settings.

7. Press **MENU** to display the **Installation Change Screen**.

```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm                    1. Cancel




                    10      1      SEL
                    Down    Up     Accept
```

Installation Change Screen

8. Accept or cancel these changes as follows:

- Press **0. Confirm** to accept the changes.
- Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for setting up an alpha input.

Setting Up Global-Store Auto Keys

You can associate one Global-Store channel as the alpha for another Global-Store channel. This means that if you load a still that has alpha information in the file the switcher will use the associated channel to load the alpha still.

Use the following procedure to set up a Global-Store Auto Key:

1. Navigate to the **Inputs Menu** as follows:

- Press **MENU** to display the **Main Menu**.
- Press **1. Inputs** to display the **Inputs Menu 1**.

2. Press **0. Inputs** to display the **Inputs Menu 2**.

```
Inputs
0. Input        BNC C01
1. Type         Off
2. AutoKey      Black
3. Shaped       No
4. Aud Chan1 Chan 1
5. Aud Chan2 Chan 2
6. Vid Format 1080i 59.94




MENU   100        10    1     SEL
Exit   Previous   Down  Up    Accept
```
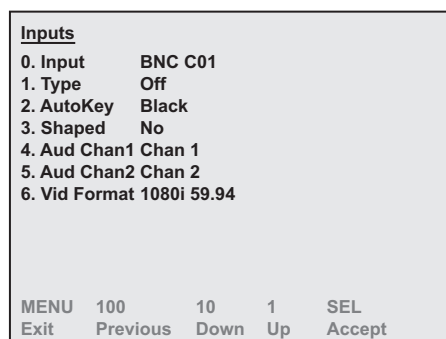
Inputs Menu 2

3. Select the Global-Store channel that will have the fill signal as follows:

   • Press **0. Input**.

   • Use the ⬇ and ⬆ buttons to select the Global-Store channel that will have the fill signal. This will be the Global-Store channel that you will load the still into.

   • Press the right **SEL** button to accept the new settings.

4. Select the Global-Store channel that will have the alpha signal as follows:

   • Press **2. AutoKey**.

   • Use the ⬇ and ⬆ buttons to select the Global-Store channel that will have the alpha signal. This will be the Global-Store channel that the alpha will be loaded into.

   • Press the right **SEL** button to accept the new settings.

5. Press **MENU** to display the **Installation Change Screen**.

```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm            1. Cancel




                      10    1     SEL
                      Down  Up    Accept
```

Installation Change Screen

6. Accept or cancel these changes as follows:

   • Press **0. Confirm** to accept the changes.

   • Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for setting up a Global-Store Auto Key.

Assigning Audio Channels

With an audio mixer connected to the Synergy 100 MD switcher you can create groups of audio channels, set the levels for audio channels or groups of channels, and assign two of them to each input BNC. You must have an audio mixer properly connected to the Synergy 100 MD switcher to be able to assign audio channels to Input BNCs. Refer to the section "**Connecting a Remote Audio Mixer**" on page 9–9 for more information.
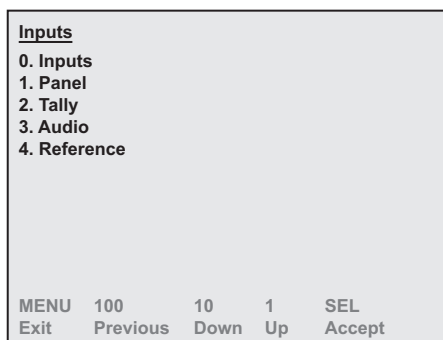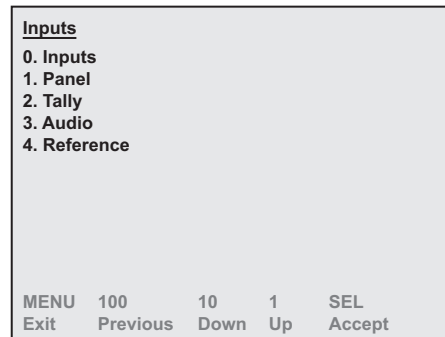
Note
> You cannot assign an audio channel to an internally generated signal.

Use the following procedure to assign audio channels or groups to an input BNC:

1. Navigate to the **Inputs Menu** as follows:

    •   Press **MENU** to display the **Main Menu**.

    •   Press **1. Inputs** to display the **Inputs Menu 1**.

```
Inputs
0. Inputs
1. Panel
2. Tally
3. Audio
4. Reference




MENU    100       10      1    SEL
Exit    Previous  Down    Up   Accept
```
Inputs Menu 1

2. Press **0. Inputs** to display the **Inputs Menu 2**.

```
Inputs
0. Input        BNC C01
1. Type         Off
2. AutoKey      Black
3. Shaped       No
4. Aud Chan1 Chan 1
5. Aud Chan2 Chan 2
6. Vid Format 1080i 59.94



MENU    100       10      1    SEL
Exit    Previous  Down    Up   Accept
```
Inputs Menu 2
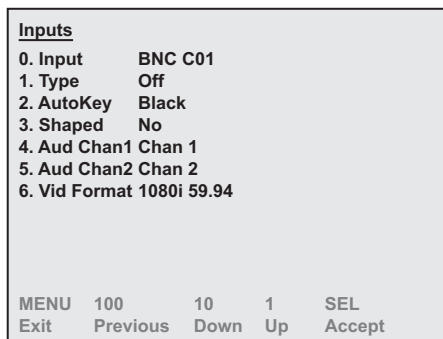
3. Select the input BNC you want to assign an audio channel to as follows:

    •   Press **0. Input**.

    •   Use the ⬇ and ⬆ buttons to select the input BNC to want to assign the audio channels or groups to.

    •   Press the right **SEL** button to accept the new settings.

4. Assign an audio channel or group to the selected input BNC as follows:

   • Press **5. Aud Chan1**.

   • Use the ⬇ and ⬆ buttons to select the audio channel or group that you want to assign to the selected input BNC.

   • Press the right **SEL** button to accept the new settings.

✓ **Operating Tip**

> You can assign a second audio channel or group to the selected input BNC by assigning it to **6. Aud Chan2**.

5. Press **MENU** to display the **Installation Change Screen**.
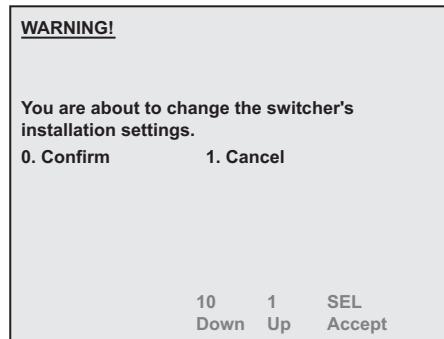
```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm              1. Cancel




                      10     1     SEL
                      Down   Up    Accept
```

Installation Change Screen

6. Accept or cancel these changes as follows:

   • Press **0. Confirm** to accept the changes.

   • Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for assign audio channels or groups to an input BNC.

Setting Up Panel Buttons

As the last step in the BNC configuration process, you can map BNC connectors to physical buttons on the control panel.

Use the following procedure to set up your control panel inputs:

1. Navigate to the **Inputs Menu** as follows:

   - Press **MENU** to display the **Main Menu**.

   - Press **1. Inputs** to display the **Inputs Menu**.

```
Inputs
0. Inputs
1. Panel
2. Tally
3. Audio
4. Reference




MENU    100        10     1     SEL
Exit    Previous   Down   Up    Accept
```

Inputs Menu

2. Press **1. Panel** to display the **Panel Menu**.

```
Panel
0. Button   1
1. Input    Black




MENU    100        10     1     SEL
Exit    Previous   Down   Up    Accept
```
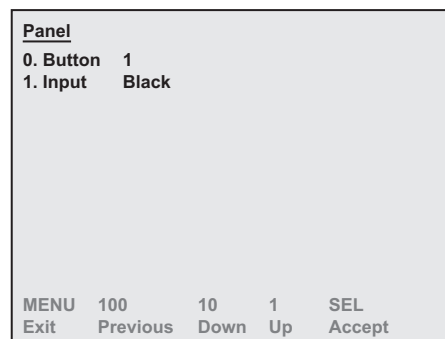
Panel Menu

3. Select the crosspoint button you want to assign to an input as follows:

   - Press **0. Button**.

   - Use the ⬇ and ⬆ buttons to select crosspoint button you want to assign to an input BNC. You can select the **unshifted** crosspoints **1** through **10** or the shifted crosspoints **Shift 1** through **Shift 10**.

   - Press the right **SEL** button to accept the new settings.

4. Assign a input to the selected crosspoint button as follows:

   - Press **1. Input**.

   - Use the ⬇ and ⬆ buttons to select the input you want to assign to the selected button. You can select between the following:

     ~ **None** — Select this option to assign no input to the crosspoint. When pressed, the button will light, but will not remain lit.

~ **BKGD** — Select this option to assign color background 1 to the crosspoint.

~ **Black** — Selecting this option to assign Black to the crosspoint.

~ **Shift** — Select this option to assign the Shift function to the crosspoint. Pressing and holding the Shift button allows you to access the 10 shifted crosspoint.

~ **RevShift** — Select this option to assign the special Key Bus Shift function to the crosspoint. The Key Bus Shift function places the Key bus in Shift mode by default. In this mode, pressing a crosspoint button will select the shifted crosspoint and pressing Shift plus the crosspoint will select the unshifted crosspoint. The crosspoint buttons on the Program and Preset Buses are unaffected by this function.

📝	**Note**	The **Reverse Shift** and **Shift** options can only be assigned to the crosspoint buttons on either end of the bus.

~ **Global-Store1** — Select this option to assign Global-Store channel 1 to the crosspoint.

~ **Global-Store2** — Select this option to assign Global-Store channel 2 to the crosspoint.

~ **Global-Store3** — Select this option to assign Global-Store channel 3 to the crosspoint.

~ **BNC** — Select **BNC C01** through **BNC C16** to assign that input BNC to the crosspoint.

• Press the right **SEL** button to accept the new settings.

5. Press **MENU** to display the **Installation Change Screen**.

```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm          1. Cancel




                    10     1     SEL
                    Down   Up    Accept
```
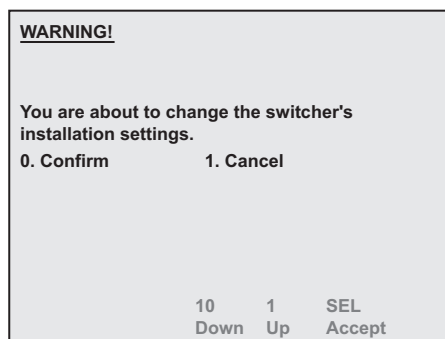
Installation Change Screen

6. Accept or cancel these changes as follows:

• Press **0. Confirm** to accept the changes.

• Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for setting up your control panel buttons.

Checking BNC Inputs

At this point in the installation process, ensure that you have performed the following tasks for *each BNC input*:

- Set up its BNC type

- Set up its auto Key association (if the input has an alpha signal)

- Set up its alpha parameters (shaped or unshaped if the input is an alpha signal)

- Set up its control panel button mapping

- Set up its tally

Now, use the following procedure to check your inputs:

1. Ensure that the program monitor is connected to the **B01** output connector (on the rear frame). Remember that, at this point in the installation, default output mapping is still in effect. The above-mentioned output is defaulted to **Program** out.

2. Ensure that each source device connected to the switcher is putting out a signal.

3. Using your "**Input Worksheet**" as a guide, press each control panel button on the **PGM** bus, starting with crosspoint 1. Verify that each signal is present on the crosspoint (as mapped) and that it matches each connected signal as written on your worksheet.

4. For each *shifted* crosspoint, *press and hold* the **SHIFT** button, then press the desired button on the **PGM** bus.

If any signal does not match, check your "**Input Worksheet**" against the settings that you made on the **Panel Menu**.

Checking Keys

Once your inputs have been checked, you should now check each auto-Key association that you have made. This procedure allows you to verify that each alpha-fill combination is working properly and generating a proper linear Key.

Use the following procedure to check your Keys:

1. On the **PGM** bus, select a background source (such as a camera or VTR).

2. In the **Transition Control** group, press **KEY1**.

3. In the **Effects Keyers** group, press **AUTO SELECT**.

4. On the **Key Bus**, select a crosspoint that has previously been defined as the fill for a Key signal.

5. After adjusting the **Clip** and **Gain**, if required, visually check the Key's appearance on the PV monitor:

    • The assigned alpha signal should be properly cutting the hole in the background.

    • The selected fill signal should be properly filling the hole.

    • The edges of the Key should be clean.

    • If the Key does not appear visually correct, the alpha and fill sources may be *incorrectly paired* or *improperly assigned.* Please check the associations in the **AutoKey** section of the **Inputs Menu**.

6. If the Key alpha and fill sources are correct, but the Key still does not appear correct *visually*, reassign the shaped designation and recheck the Key's visual appearance.

This completes the procedure for checking your Keys.

Output Configuration

In This Chapter

This chapter provides instructions for configuring and checking your BNC outputs. As you follow each procedure, you are in effect building a *database* that is used by the switcher to provide the desired names, sources, key and fill associations, and overall switcher functionality.

The following procedures are discussed:

- Output Configuration Menu Tree
- Output Worksheet
- Output Connection
- Configuring the Outputs
- Connecting and Verifying Outputs
- MultiDSK Option
- Additional Output Setup

Note

Before you begin, ensure that you have completed your **Output Worksheet**. Refer to the section "**Output Worksheet**" on page 8–3.

Output Configuration Menu Tree

The following figure illustrates the portion of the menu tree that is used for output setup procedures. Refer to this diagram throughout this chapter.
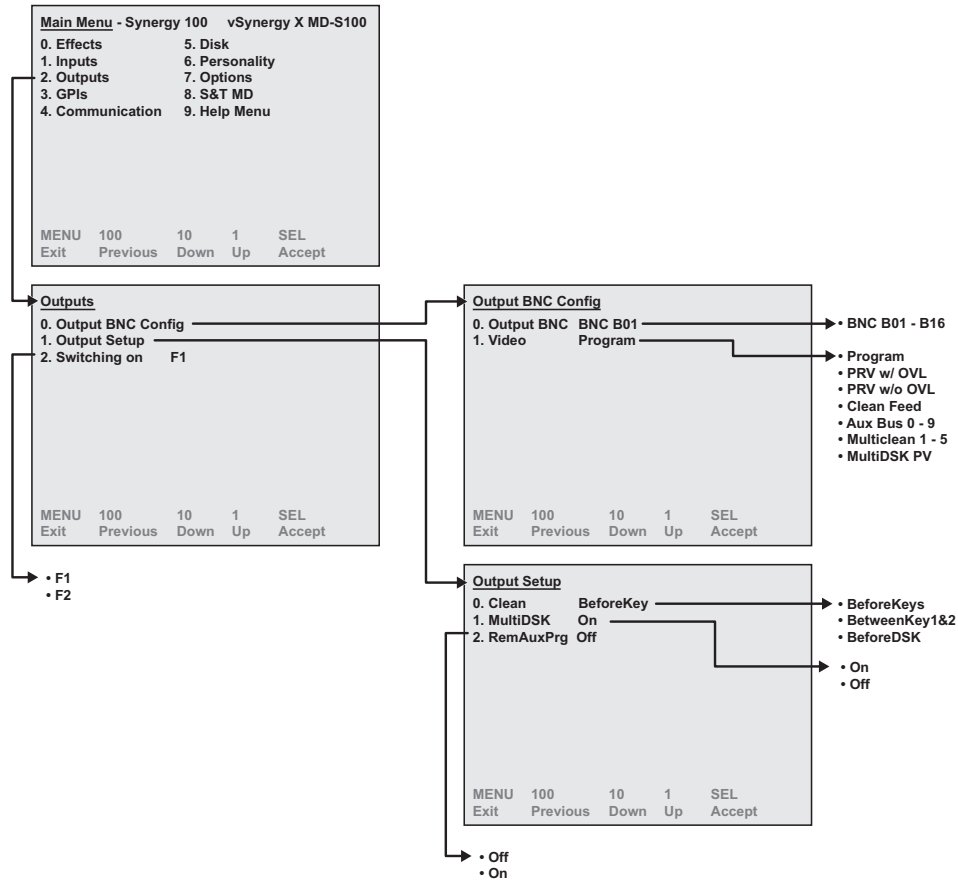
Output Configuration Menu Tree

Output Worksheet

Complete the following worksheet for all of your video outputs. To avoid marking up the Complete the following worksheet for all of your video outputs. To avoid marking up the *Engineering Manual*, you can also use the worksheet provided in Appendix C "**Installation Worksheets**" to make extra copies.

For each output, (moving from left to right in the worksheet columns):

- Check whether the output is locked because of an option.

- Fill in the output type.

- Fill in the destination of the outputs.

> **Note**   Output **BNCs B01** and **B02** are locked to **Program** and **Preview with Overlay**. If the **MultiDSK** option is enabled, Output **BNCs B01** through **B06** are locked. Refer to the section "**MultiDSK Option**" on page 8–8 for more information.

BNC Output Worksheet

BNC Output Connector #	Locked Output Type (MultiDSK)	Output Type	Destination
e.g. 1 B01		Program	Master Control
e.g. 1 B13		AuxBus 1:3	Monitor 6
B01	Program		
B02	Preview with Overlay		
B03	Preview without Overlay		
B04	Preview without Overlay		
B05	Clean Feed 1		
B06	Clean Feed 2		
B07	Preview with Overlay (not locked)		
B08			
B09			
B10			
B11			
B12			
B13			
B14			
B15			
B16			

Configuring the Outputs

Every Synergy 100 MD Switcher comes standard with 16 multi-definition serial digital outputs. Outputs are configured using the Synergy 100 MD menu system, and can be used as MLE Program, MLE Preview, Clean Feed, Preview Overlay, or Aux Buses.

Use this procedure to configure your general outputs, such as Program, Preview, Clean Feed, and Aux Bus outputs.

Setting Up General Outputs

The **Outputs Menu** allows you to associate physical BNC connectors with output *types*. These associations play important roles throughout the system, particularly with regard to *filtering* subsequent output setup menus based on specific output types.

✎ **Note** | Use this procedure to configure your general outputs, such as Program, Preview, Clean Feed, and Aux Bus outputs. This procedure will assume that your Synergy 100 MD switcher does not have the **MultiDSK** option installed.

Use the following procedure to set your Output BNCs:

1. Navigate to the **Outputs Menu** as follows:

    •   Press **MENU** to display the **Main Menu**.

    •   Press **2. Outputs** to display the **Outputs Menu**.

    ```
    Outputs
    0. Output BNC Config
    1. Output Setup
    2. Switching on       F1




    MENU    100           10      1     SEL
    Exit    Previous      Down    Up    Accept
    ```
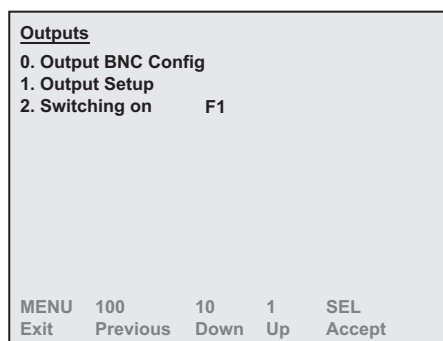
    Outputs Menu

2. Press **0. Output BNC Config** to display the **Output BNC Config Menu**.

✎ **Note** | Output **BNC B01** and **B02** are locked to **Program** and **Preview with Overlay**.

```
Output BNC Config
0. Output BNC    BNC B01
1. Video         Program




MENU  100      10    1    SEL
Exit  Previous  Down  Up   Accept
```
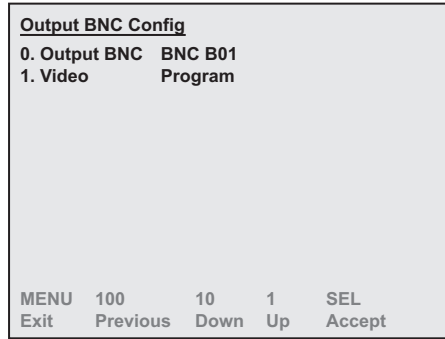
Output BNC Config Menu

3. Select a BNC output to assign an output type as follows:

    • Press **0. Output BNC**.

    • Use the ⬇ and ⬆ buttons to select from BNC **B03** through to BNC **B16**.

    • Press **SEL** to accept the selection.

4. Assign the output type to the select BNC as follows:

    • Press **1. Video**.

    • Use the ⬇ and ⬆ buttons to select one of the following output types:

        ~ **Program** — Select **Program** to assign the BNC output type to Program.

        ~ **PRV w/ OVL** — Select **PRV w/ OVL** to assign the BNC output type to Preview with the Overlay.

        ~ **PRV w/o OVL** — Select **PRV w/o OVL** to assign the BNC output type to Preview without the Overlay.

        ~ **Clean Feed** — Select **Clean Feed** to assign the BNC output type to a Clean Feed. Refer to the section "**Clean Feed Setup**" on page 8–10 for the procedure to set up and select the Clean Feed output type.

        ~ **Aux Bus** — Select Aux Bus to assign the BNC output type to an Aux Bus (numbered from 0 to 9).

    • Press **SEL** to accept the selection.

5. Assign each Output BNC as desired.

6. Press **MENU** to display the **Installation Change Screen**.
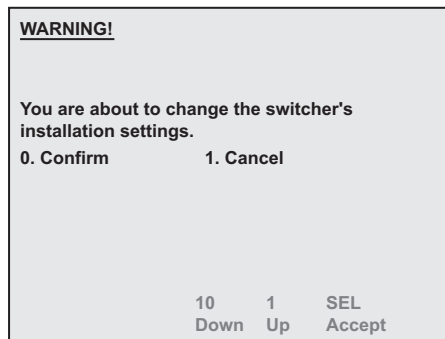
```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm           1. Cancel




            10    1    SEL
            Down  Up   Accept
```

Installation Change Screen

---

7. Accept or cancel these changes as follows:

- Press **0. Confirm** to accept the changes.
- Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for setting your Output BNC types.

Connecting and Verifying Outputs

This section covers the following topics:

- Output Connection
- Output Verification

![pencil icon] **Note** Before you begin, ensure that you have completed your **Output Worksheet**.

Output Connection

Connect the outputs to the desired external destinations, such as program monitors, preview monitors, transmission, routing switchers, VTRs, etc.

Connect auxiliary outputs to external destinations, such as monitors, VTRs, DVE channels, routing switchers, etc.
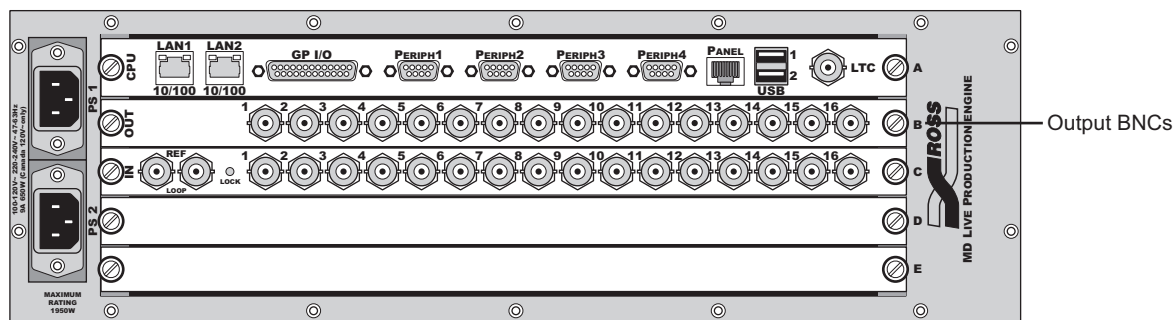
Output Board

Output Verification

For verification of your outputs, ensure that *some form of monitoring* is available at the destination of each specific output. The destination device *itself* may be a monitor, however, if the destination is a VTR or a routing switcher, ensure that you can monitor the input signal to the specific device.

Output Verification

To Verify This Output	Do This ...
PGM	Switch between inputs on the **PGM** bus.
PV w/ OVL	Switch between inputs on the **PST** bus.
PV w/o OVL	Switch between inputs on the **PST** bus.
AUX 0 - 9	Switch between inputs on the MLE.
CLEAN	Output depends on clean feed point of origin. Refer to the section "**Clean Feed Setup**" on page 8–10 for instructions

MultiDSK Option

The MultiDSK™ option provides two additional Downstream Keyers, DSK 4 and DSK 5. Refer to Chapter 7, "**Keying**", in the *Synergy 100 MD Operator's Manual* for more information on using MultiDSK.

If you have the **Multi-DSK Option** installed, the **TRANS LIMIT** and **PST BLACK** buttons will be changed to **DSK4 DISS** and **DSK5 DISS**, respectively and the Transition Limit and PST Black features will be unavailable.

The MultiDSK option assigns and locks certain BNCs on the Output Board to the main switcher outputs. These assignments are as follows:

- **Output #B01** — This output is locked to **Program**.

- **Output #B02** — This output is locked to **Program** (same as **B01**).

- **Output #B03** — This output is locked to **Multi Preview** without Overlay.

✎ **Note** | The Multi Preview output is a dedicated preview for the MultiDSK Keys. This preview is not assignable to any other Output BNC and only includes the MultiDSK Keys.

- **Output #B04** — This output is locked to **Multi Preview** (same as **B03**).

- **Output #B05** — This output is locked to **Multi Clean 2**, which is taken before Downstream Key 4.

- **Output #B06** — This output is locked to **Multi Clean 3**, which is taken before Downstream Key 5.

- **Output #B07** — This output is set, but not locked, to **PRV w/ OVL** (Preview with Overlay). **Output #B07** is automatically set to Preview with Overlay when you set up a MultiDSK. This can be changed later.

MultiDSK Setup

Use the following procedure to enable the MultiDSK:

✎ **Note** | The MultiDSK option must be purchased and installed before you can activate it.

1. Navigate to the **Outputs Menu** as follows:

   - Press **MENU** to display the **Main Menu**.
   - Press **2. Outputs** to display the **Outputs Menu**.

2. Press **1. Output Setup** to display the **Output Setup Menu**.

```
Output Setup

0. Clean          BeforeKey
1. MultiDSK       Off
2. RemAuxPrg      Off




MENU    100       10    1    SEL
Exit    Previous  Down  Up   Accept
```

Output Setup Menu

3. Press **1. MultiDSK** to toggle the option on.

   The following warning message appears when enabling MultiDSK:

```
You are about to change the output configuration
to enable MultiDSK. You may lose PRV w/ OVL.
Output BNC B07 will be assigned to PRV w/ OVL.
0. Confirm                    1. Cancel




MENU    100       10    1    SEL
Exit    Previous  Down  Up   Accept
```

Enabling Multi DSK Warning Message

⚠ **Important** | A similar warning displays when disabling the MultiDSK option.

4. Press **0. Confirm**.

This completes the procedure for enabling the MultiDSK option. Refer to Chapter 7, "**Keying**", in the *Synergy 100 MD Operator's Manual*, for more information on working with MultiDSK Keys.

Additional Output Setup

The **Output Menu** also allows you to set up the Clean Feed output parameters and select a field dominance.

Clean Feed Setup

The **Output Setup Menu** allows you to set the point from which the clean feed signal is derived. The selected signal then appears on the Clean Feed outputs. Once you assign an output BNC to use the Clean Feed, you can select the point of output in the BNC's video path.

Use the following procedure to assign the Clean Feed to an output BNC:

1. Navigate to the **Outputs Menu** as follows:

   • Press **MENU** to display the **Main Menu**.

   • Press **2. Outputs** to display the **Outputs Menu**.

```
Outputs
0. Output BNC Config
1. Output Setup
2. Switching on        F1




MENU    100         10     1     SEL
Exit    Previous    Down   Up    Accept
```
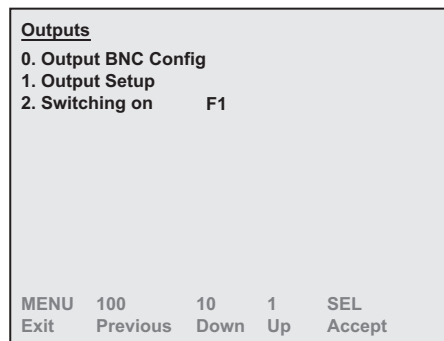
Outputs Menu

2. Press **0. Output BNC Config** to display the **Output BNC Config Menu**.

```
Output BNC Config
0. Output BNC    BNC B09
1. Video         Clean Feed





MENU    100         10     1     SEL
Exit    Previous    Down   Up    Accept
```
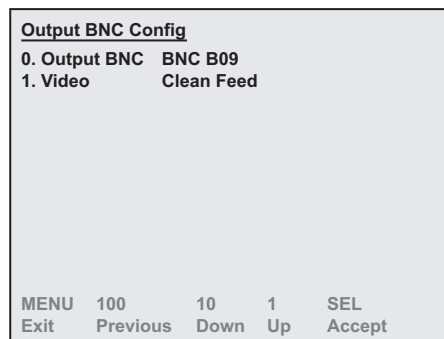
Output BNC Config Menu

✎   **Note**   Output **BNC B01** and **B02** are locked to **Program** and **Preview with Overlay**.

3. Select a BNC output to assign the Clean Feed output as follows:

   • Press **0. Output BNC**.

   • Use the ⬇ and ⬆ buttons to select from BNC **B03** and BNC **B16**.

   • Press **SEL** to accept the selection.

4. Assign the Clean Feed output to the select BNC as follows:

   - Press **1. Video**.

   - Use the ⬇ and ⬆ buttons to select the **Clean Feed** output.

   - Press **SEL** to accept the selection.

5. Press **BACK** to return to the **Outputs Menu**.

6. Navigate to the **Output Setup Menu** as follows:

   - Press **MENU** to display the **Main Menu**.

   - Press **2. Outputs** to display the **Outputs Menu**.

   - Press **1. Output Setup** to display the **Output Setup Menu**.

```
Output Setup
0. Clean          BeforeKey
1. MultiDSK       Off
2. RemAuxPrg      Off




MENU   100        10     1     SEL
Exit   Previous   Down   Up    Accept
```
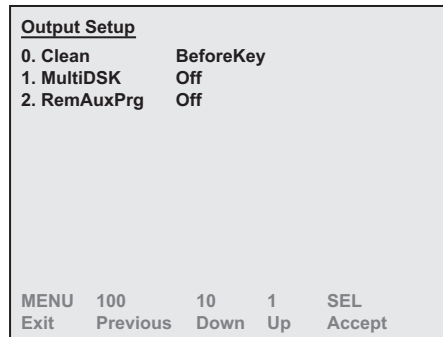
Output Setup Menu

7. Select the point from which the output is taken in the BNC's video path as follows:

   - Press **0. Clean** to select the clean feed setup.

   - Use the ⬇ and ⬆ buttons to select the clean feed point from the following:

     ~ **BeforeKey** — The clean feed output is pulled after the MLEs program/preset bus, but *before* the two keys are added.

     ~ **Between Key 1&2** — The clean feed output is pulled downstream of the first MLE keyer, but before the second key.

     ~ **BeforeDSK** — The clean feed output is pulled after the MLE's program/preset bus, but before the Downstream keyer is added.

   - Press **SEL** to accept the selection.

8. Press **MENU** to display the **Installation Change Screen**.

```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm             1. Cancel




                       10     1     SEL
                       Down   Up    Accept
```
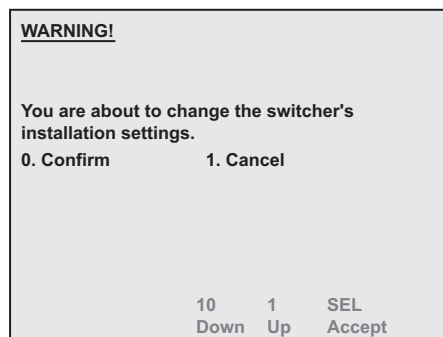
Installation Change Screen

---

9. Accept or cancel these changes as follows:

    •   Press **0. Confirm** to accept the changes.

    •   Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This concludes the procedure to assign the Clean Feed to an output BNC.

Field Dominance Setup

The **Switching on** option in the **Outputs Menu** allows you to select when the Synergy 100 MD switcher will trigger a transition from one video source to the next. Each video frame is composed of an Odd Field and an Even Field, Field 1 and Field 2 respectively.

> ✎ **Note**   If you are operating in a progressive scan video format, the Field Dominance option is not available.

Use the following procedure to setup the **Switching on** option:

1. Navigate to the **Outputs Menu** as follows:

    •   Press **MENU** to display the **Main Menu** on the **Preview Overlay**.

    •   Press **2. Outputs** to display the **Outputs Menu**.

```
Outputs
0. Output BNC Config
1. Output Setup
2. Switching on      F1




MENU   100        10    1    SEL
Exit   Previous   Down  Up   Accept
```
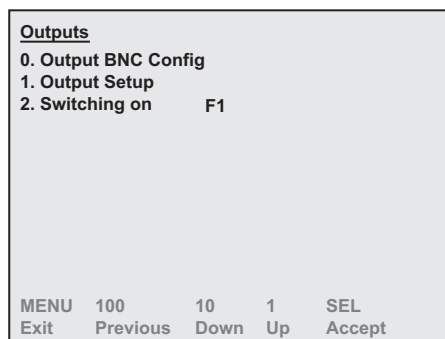
Outputs Menu

2. Select a field as follows:

    •   Press **2. Switching on** to select the option.

    •   Use the ⬇ and ⬆ buttons to select the field from the following:

        ~   **F1** — Select this option to enable the Synergy 100 MD switcher to trigger the transition to the next video source after the **Odd Field** of the *previous* video source. This is the default setting.

        ~   **F2** — Select this option to enable the Synergy 100 MD switcher to trigger the transition to the next video source after the **Even Field** of the *previous* video source.

    •   Press **SEL** to accept the selection.

3. Press **MENU** to display the **Installation Change Screen**.
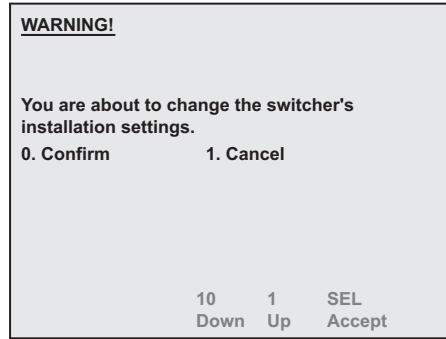
```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm              1. Cancel




                        10     1     SEL
                        Down   Up    Accept
```

Installation Change Screen

    4.   Accept or cancel these changes as follows:

- Press **0. Confirm** to accept the changes.

- Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure to set up the **Field Dominance** feature for the Synergy 100 MD switcher.

Communication Setup

In This Chapter

This chapter provides instructions for setting up communication parameters with external equipment, such as Editors and Audio Mixers.

The following topics are discussed:

- Peripheral Ports
- Editor Communication Setup
- Remote Audio Mixer Communication Setup
- Serial Tally Communication Setup

Note For information on setting up a Remote Aux Panel, refer to the section, "**Remote Aux Panel Overview**" on page 10-2.

Peripheral Ports

Remote devices for the Synergy 100 MD switcher are controlled through the **Peripheral Ports 1** through **4** located on the CPU Board at the back of the Synergy 100 MD frame. When properly connected and set up, you can use a remote device to control the switcher, or use the switcher to control a remote device.
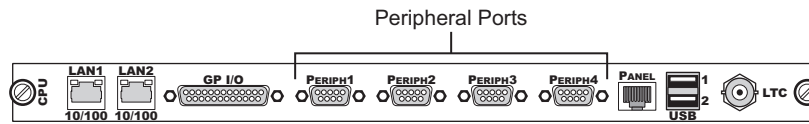
CPU Board — Peripheral Ports

✎	**Note**	All Peripheral Ports are DB9, Female, supporting RS-232 or RS-422 communications.

Editor Communication Setup

The **Editor and Automation Interface** option allows you to use the Synergy 100 MD switcher for linear editing, using an editor that supports the **GVG100**, **GVG200**, or **GVG4000** protocols.

Editor Menu Tree

The Editor Menu allows you to assign an editor to a Peripheral port and communicate with the editor using one of the supported communications protocols.
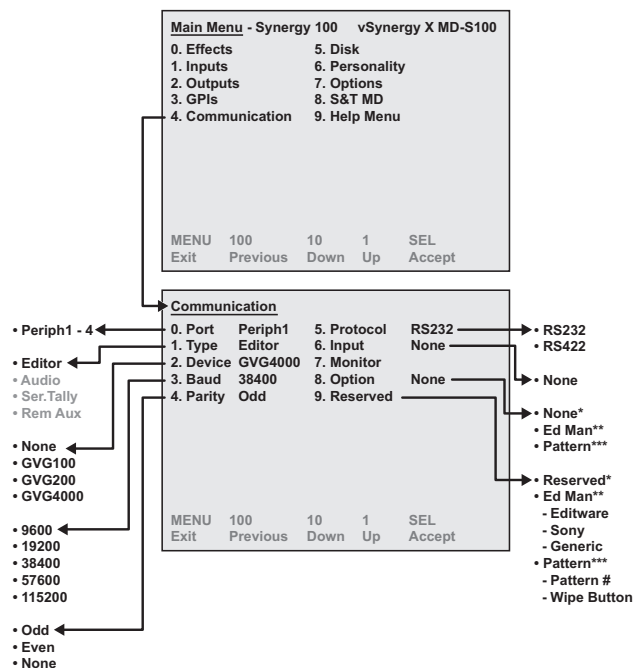
Communication — Editor Menu Tree

Editor Setup

In order to control the Synergy 100 MD Switcher from an Editor, you will have to connect the Editor to one of the **4** Peripheral Ports located at the back of the frame. Once the Editor is connected to the frame, you can set up the communications parameters for the device.

	Note	The **Editor and Automation Interface** option must be installed in order to set up and communicate with the editor.

Use the following procedure to set up an Editor:

1. Navigate to the **Communication Menu** as follows:

    • Press **MENU** to display the **Main Menu**.

    • Press **4. Communication** to display the **Communication Menu**.

```
┌─────────────────────────────────────────┐
│ Communication                           │
│                                         │
│ 0. Port    Periph1   5. Protocol  RS232 │
│ 1. Type    Editor    6. Input     None  │
│ 2. Device  GVG4000   7. Monitor         │
│ 3. Baud    38400     8. Option    None  │
│ 4. Parity  Odd       9. Reserved        │
│                                         │
│                                         │
│                                         │
│                                         │
│                                         │
│ MENU    100       10    1     SEL       │
│ Exit    Previous  Down  Up    Accept    │
└─────────────────────────────────────────┘
```

Communication Menu — Editor

2. Select the peripheral port that is connected to the editor as follows:

    • Press **0. Port**.

    • Use the ↓ and ↑ buttons to select the peripheral port on the Synergy 100 MD switcher that is connected to the editor.

    • Press the right **SEL** button to accept the new settings.

3. Assign a peripheral port to Editor as follows:

    • Press **1. Type**.

    • Use the ↓ and ↑ buttons to select **Editor**.

    • Press the right **SEL** button to accept the new settings.
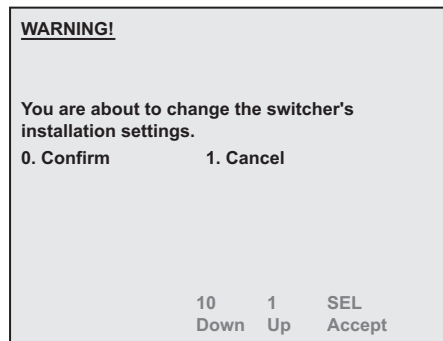
4. Select the device you want to assign to the editor communications port as follows:

    • Press **2. Device**.

    • Use the ↓ and ↑ buttons to select the type of editor that is connected to the port. You can select between the following:

        ~ **None** — Use this option to not assign an editor to the selected port.

        ~ **GVG100** — Use this option to assign an editor to the selected port using the **GVG 100 Editor** protocol.

✎   **Note**   If your editor uses the GVG100 protocol, you will have to set up the extra options for your device. Refer to the section "**Editor Extra Options**" on page 9-6 for more information.

        ~ **GVG200** — Use this option to assign an editor to the selected port using the **GVG 200 Editor** protocol.

        ~ **GVG4000** — Use this option to assign an editor to the selected port using the **GVG 4000 Editor** protocol.

    • Press the right **SEL** button to accept the new settings.

5. Select the Baud rate for the editor you have connected to the port as follows:

    • Press **3. Baud**.

    • Use the ↓ and ↑ buttons to select the baud rate for the editor. Refer to your editor documentation for the baud rate for your device.

    • Press the right **SEL** button to accept the new settings.

6. Select the Parity for the editor you have connected to the port as follows:

   - Press **4. Parity**.
   - Use the ⬇ and ⬆ buttons to select the parity for the editor. Refer to your editor documentation for the parity for your device.
   - Press the right **SEL** button to accept the new settings.

7. Select the communications protocol for the editor you have connected to the port as follows:

   - Press **5. Protocol**.
   - Use the ⬇ and ⬆ buttons to select the communications protocol for the editor. Refer to your editor documentation for the parity for your device. You can choose between the following:

     ~ **RS232** — Use this option if the editor uses the RS-232 communications protocol.

     ~ **RS422** — Use this option if the editor uses the RS-422 communications protocol.

   - Press the right **SEL** button to accept the new settings.

8. If you are using the **GVG100** protocol, you must set up the extra options for your specific editor. Complete the procedure in the section "**Editor Extra Options**" on page 9-6 to finish setting up your editor. If you are using the **GVG4000** protocol, proceed to the next step.
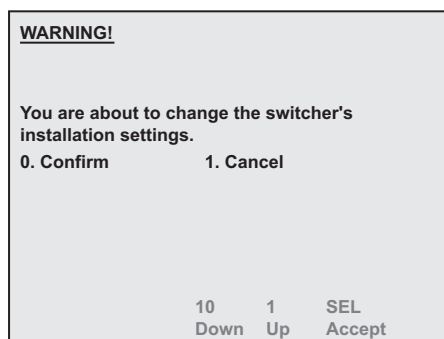
9. Press **MENU** to display the **Installation Change Screen**.

```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm            1. Cancel




                              10    1    SEL
                              Down  Up   Accept
```

Installation Change Screen

10. Accept or cancel these changes as follows:

    - Press **0. Confirm** to accept the changes.
    - Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for setting up an Editor on a peripheral port.

Editor Extra Options

The **GVG100** editor protocol has extra options that must be set up to properly interface with specific editors, and determine how you want to interface with it.

Use the following procedure to set up the extra option for your editor:

1. Ensure that the **Communication Menu** is displayed and that menu item **0. Port** is set to the editor you want to set up the extra options for.

2. Assign a specific editor device to the selected peripheral port as follows:

    *   Press **8. Option**.
    *   Use the ⬇ and ⬆ buttons to select **Ed Man**.
    *   Press the right **SEL** button to accept the new settings.

> ✎ **Note** | When menu item **8. Option** is set to **Ed Man**, menu item **9. Reserved** changes to **9. Ed Man**.

    *   Press **9. Ed Man**.
    *   Use the ⬇ and ⬆ buttons to select the specific editor device you have connected to the peripheral port. You can choose between the following:
        *   ~ **Editware** — Use this option to assign an Editware™ editor to the selected port.
        *   ~ **Sony** — Use this option to assign a Sony™ editor to the selected port.
        *   ~ **Generic** — Use this option to assign an editor that is produced by a company not listed here.
    *   Press the right **SEL** button to accept the new settings.

3. Assign the wipe pattern selection method you want to use for the editor as follows:

    *   Press **8. Option**.
    *   Use the ⬇ and ⬆ buttons to select **Pattern**.
    *   Press the right **SEL** button to accept the new settings.

> ✎ **Note** | When menu item **8. Option** is set to **Pattern**, menu item **9. Reserved** changes to **9. Pattern**.

    *   Press **9. Pattern**.
    *   Use the ⬇ and ⬆ buttons to assign a wipe pattern assignment method to the editor. You can choose between the following:
        *   ~ **Pattern #** — Use this option to have wipe patterns selected by their actual wipe number.
        *   ~ **Wipe Bttn** — Use this option to have wipe patterns selected by the number of the pattern button the wipe is assigned to.
    *   Press the right **SEL** button to accept the new settings.

4. Press **MENU** to display the **Installation Change Screen**.

```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm            1. Cancel




                      10     1     SEL
                      Down   Up    Accept
```

Installation Change Screen

5. Accept or cancel these changes as follows:

    •   Press **0. Confirm** to accept the changes.

    •   Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for setting up the extra options for an editor.

| **Note** | Refer to Chapter 10, "**Peripheral Control and More**" of the *Synergy 100 MD Operator's Manual* for more information on using an editor. |

Remote Audio Mixer Communication Setup

The **Small Audio Mixer Interface** option allows you to use the Synergy 100 MD to control a small Audio Mixer for standard Audio Follow Video production. When configured, a Remote Audio Mixer channel or, group of channels, will follow a video source when that source is taken to air. Channels will be brought up as the source is taken to air, and unused channels will be brought down on the same transition.

Supported Remote Audio Mixers

The following Remote Audio Mixers are currently supported by your Synergy 100 MD switcher:

- **Yamaha 01V96**

- **Graham-Patten D/ESAM-8000**

Remote Audio Mixer Menu Tree

The **Audio Menu** allows you to assign an Audio Mixer to a Peripheral port and control that Audio Mixer for audio follow video production.
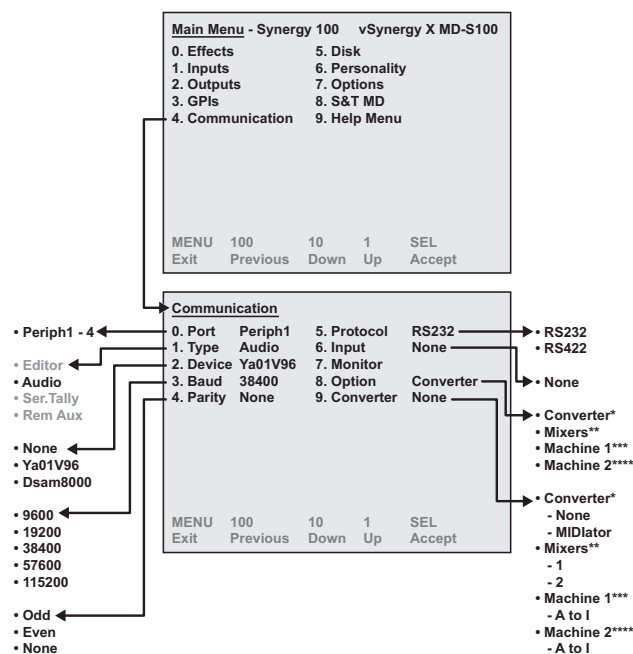
Communication Menu Tree — Audio Setup

Connecting a Remote Audio Mixer

In order to properly set up your Remote Audio Mixer to be controlled from your Synergy 100 MD switcher, you must connect the control cables from the switcher to the Audio Mixer. Then you must set up the communications protocols for the Audio Mixer on the peripheral port that you connected the Audio Mixer to.

> **Note** The **Small Audio Mixer Interface** option must be installed in order to set up and communicate with the Audio Mixer.

Connecting a Single Remote Audio Mixer without a MIDIator

In order to properly complete this procedure you will need the following software options and cables:

- **Small Audio Mixer Interface** — This is the software option from Ross Video that allows your Synergy 100 MD switcher to control up to 16 audio channels on an Audio Mixer.

- **DB9 Interface Cable** — This cable connects the 9-Pin, D-Type Peripheral Port on the Synergy 100 switcher frame to the 9-pin, D-Type serial port on the Remote Audio Mixer. Refer to the section "**MIDIator Interface Cable Specifications**" on page 9-14 for information on this cable.

The following diagram and procedure describe the basic physical connection of an Audio Mixer to your Synergy 100 MD switcher. The locations or names of ports may vary with your Audio Mixer.

Use the following procedure to connect a single Remote Audio Mixer without a MIDIator to your Synergy 100 MD switcher:

1. Connect and secure the **9-Pin D-Type** end of the **Interface Cable** to one of the **Remote Ports** on the back of the Synergy 100 MD switcher control panel.

2. Connect and secure the other end of the **9-Pin D-Type Interface Cable** to the appropriate port on the Remote Audio Mixer. The suggested ports for each supported Audio Mixer are as follows:

   - **Graham-Patten D/ESAM-8000** — Connect the Interface Cable to the Edit Port on the CPU Controller. Refer to the "**Graham-Patten D/ESAM-8000 Cabling**" on page 9-14 for more information on the cabling for this Audio Mixer.
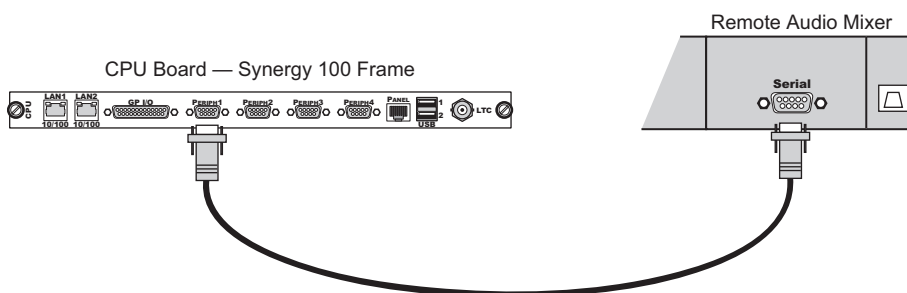
Connecting a Remote Audio Mixer to a Synergy 100 MD switcher without a MIDIator

This completes the procedure for connecting a single Remote Audio Mixer to a Synergy 100 MD switcher without a MIDIator. Refer to the "**Setting up Communication with a Remote Audio Mixer**" on page 9-15 for instructions on how to set up the communications protocols on the Synergy 100 MD switcher, as well as the Remote Audio Mixer.

Connecting a Single Remote Audio Mixer with a MIDIator

In order to properly complete this procedure you will need the following software options, cables, and equipment:

- **Small Audio Mixer Interface** — This is the software option from Ross Video that allows your Synergy 100 MD switcher to control up to 16 audio channels on an Audio Mixer.

- **MIDIator (MS-124W)** — This device converts the serial interface from the Synergy 100 MD switcher to a MIDI format.

- **MIDIator Interface Cable** — This is a straight-through cable with a DB9 to DB25 converter at one end. This cable connected the 9-pin, D-Type Peripheral port on the frame to the 25-pin, D-Type port on the MIDIator. Refer to the section "**MIDIator Interface Cable Specifications**" on page 9-14 for information on this cable.

- **MIDI Cable** — This is a MIDI cable that connects the 5-pin, DIN port on the MIDIator to the 5-pin, DIN port on the Remote Audio Mixer. You will need two of these cables.

The following diagram and procedure describe the physical connections of a Yamaha 01V96 Audio Mixer to your Synergy 100 MD switcher. The locations or names of ports may vary with your Audio Mixer.

Use the following procedure to connect a single Remote Audio Mixer to your switcher via a MIDIator:

1. Connect and secure the **9-Pin** end of the **MIDIator Interface Cable** to one of the **Peripheral Ports** on the back of the Synergy 100 MD frame.

2. Connect and secure the **25-Pin** end of the **MIDIator Interface Cable** to the **Serial Port** on the MIDIator.

3. Install the first **MIDI Cable** connecting the **MIDIator** to the **Remote Audio Mixer** as follows:

   - Connect one end of a MIDI Cable to the **OUT 1** port on the **MIDIator**.

   - Connect the other end of the MIDI Cable to the **MIDI IN** port on the **Remote Audio Mixer**.

4. Install the second MIDI Cable connecting the **MIDIator** to the **Remote Audio Mixer** as follows:

   - Connect one end of a MIDI Cable to the **IN** port on the **MIDIator**.

   - Connect the other end of the MIDI Cable to the **MIDI OUT** port on the **Remote Audio Mixer**.

5. Set up the MIDIator to **Multiple Burst** as follows:

   - Set the **B–A** switch to **B**.

   - Set the **S–M** switch to **M**.
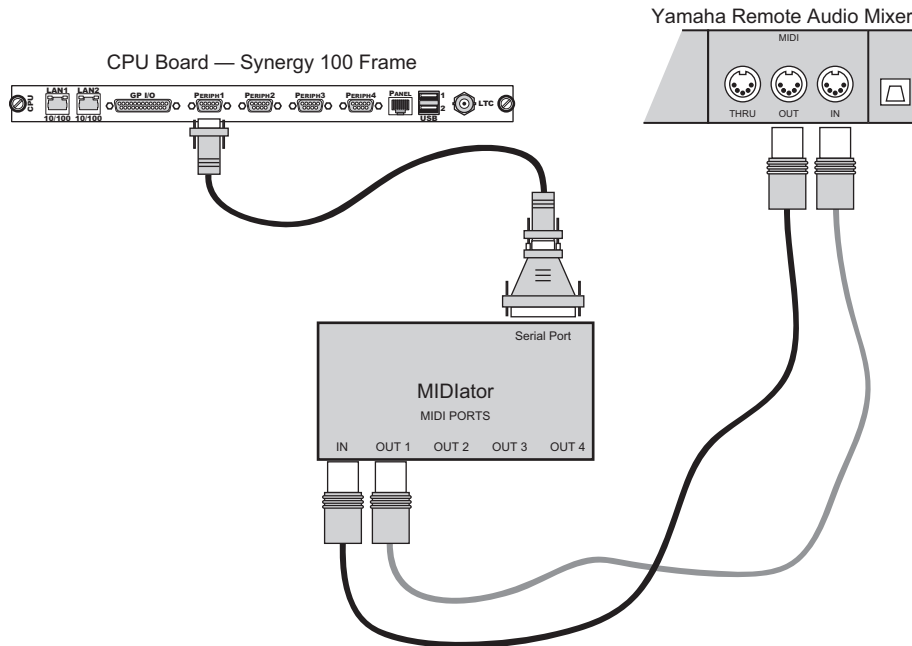
Connecting a Single Small Remote Audio Mixer to the Synergy 100 MD switcher

This completes the procedure for connecting a single Remote Audio Mixer to a Synergy 100 MD switcher.

Connecting Multiple Remote Audio Mixers

When connecting multiple Audio Mixers together you are telling the two Audio Mixers to act as one larger Audio Mixer. The total number of audio channels available will depend on the Audio Mixer you have, as well as the Audio Mixer Interface option you have.

	Note	The **Small Audio Mixer Interface** option enables you to control up to **16** audio channels.

In order to properly complete this procedure you will need the following software options, cables, and equipment:

- **Small Audio Mixer Interface** — This is the software option from Ross Video that allows your Synergy 100 MD switcher to control Audio Mixers.

- **Audio Mixer Ganging** — This is the hardware option from Ross Video that supplies a **MIDIator** and a **MIDI Solutions Merger**.

- **MIDIator** (MS-124W) — This device converts the serial interface from the Synergy 100 MD switcher to a MIDI format.

- **MIDIator Interface Cable** — This is a straight-through cable with a DB9 to DB25 converter at one end. This cable connects the 9-Pin, D-Type port on the Synergy 100 MD frame to the 25-Pin, D-Type port on the MIDIator. Refer to the "**MIDIator Interface Cable Specifications**" on page 9-14 for information on this cable.

- **MIDI Solutions Merger** — This device allows you to connect two Remote Audio Mixers and communicate with the Synergy 100 MD switcher. The **Merger** is MIDI-powered from the **Out** MIDI cable. When the Merger is powered and operating

normally, the red **MIDI** LED will illuminate. This **MIDI** LED will flash when the Merger is passing information.

✎   **Note** | If the **MIDI** LED goes out, and the MIDI cables are still properly connected to it, the Synergy 100 MD switcher is no longer receiving information from the Audio Mixers. Normal control of the Audio Mixers is *still possible*, but any manual level adjustment on the mixers will not be recorded by the switcher. To regain full communication between the Synergy 100 MD switcher and the Merger, cycle the power on the Merger by unplugging and reconnecting the **Out** MIDI cable.

•   **MIDI Cables** — This is a MIDI cable that connects the 5-Pin, DIN port on the MIDIator to the 5-Pin, DIN port on the Audio Mixer. You will need at least two of these cables, plus one for the MIDI Solutions Merger.

The following diagram and procedure describe the physical connection of two Yamaha 01V96 Audio Mixers to your Synergy 100 MD switcher. The locations or names of ports may vary with your Audio Mixer.

✎   **Note** | When connecting multiple Remote Audio Mixers together, you must set the first Audio Mixer to **Channel 1** and the second to **Channel 2** on the Audio Mixers themselves. Refer to the section "**Setting up a Remote Audio Mixer**" on page 9-18 for more information.

Use the following procedure to connect multiple Remote Audio Mixers to your Synergy 100 MD switcher:

1. Connect and secure the **9-Pin** end of the MIDIator Interface Cable to one of the **Peripheral Ports** on the back of the Synergy 100 MD frame.

2. Connect and secure the **25-Pin** end of the MIDIator Interface Cable to the **Serial Port** on the MIDIator.

3. Connect the MIDI Solutions **Merger** to the **MIDIator** as follows:

   • Connect one end of a MIDI Cable to the **IN** port on the **MIDIator**.

   • Connect the other end of the MIDI Cable to the **Out** port of the **Merger**.

4. Install the first MIDI Cable connecting the **MIDIator** to **Remote Audio Mixer 1** as follows:

   • Connect one end of a MIDI Cable to the **OUT 1** port on the **MIDIator**.

   • Connect the other end of the MIDI Cable to the **MIDI IN** port on **Remote Audio Mixer 1**.

5. Install the second MIDI Cable connecting the **MIDIator** to **Remote Audio Mixer 2** as follows:

   • Connect one end of a MIDI Cable to the **OUT 2** port on the **MIDIator**.

   • Connect the other end of the MIDI Cable to the **MIDI IN** port on **Remote Audio Mixer 2**.

6. Install the first cable connecting the **Merger** to **Remote Audio Mixer 1** as follows:

   - Connect one end of a MIDI Cable to the **In 1** port on the **Merger**.
   - Connect the other end of the MIDI Cable to **MIDI OUT** port on **Remote Audio Mixer 1**.

7. Install the second cable connecting the **Merger** to **Remote Audio Mixer 2** as follows:

   - Connect one end of a MIDI Cable to the **IN 2** port on the **Merger**.
   - Connect the other end of the MIDI Cable to **MIDI OUT** port on **Remote Audio Mixer 2**.

8. Set up the MIDIator to **Multiple Burst** as follows:

   - Set the **B–A** switch to **B**.
   - Set the **S–M** switch to **M**.
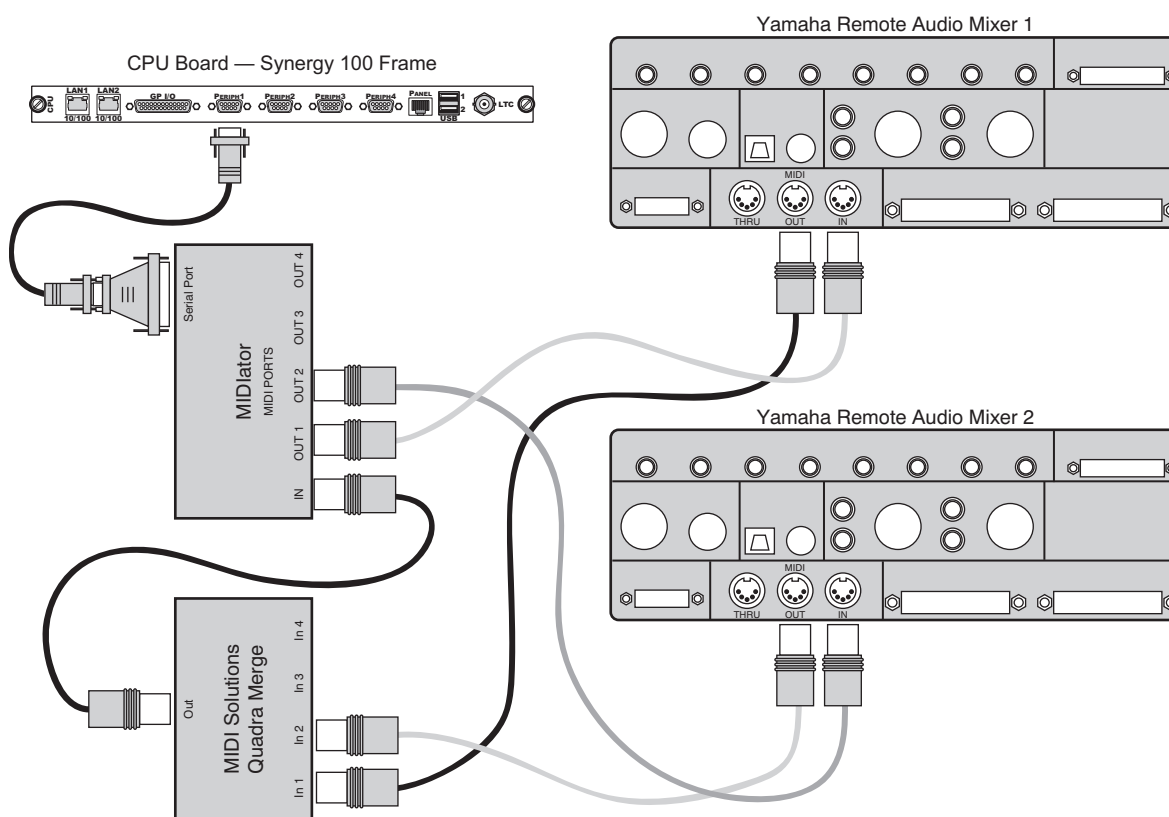
Connecting Two Remote Audio Mixers to the Synergy 100 MD Frame

✎	**Note**	On the Remote Audio Mixers you will have to set each one up so that the first Audio Mixer controls the first set of channels and the second one the second set of channels. Refer to the section "**Setting up a Remote Audio Mixer**" on page 9-18 for more information on setting up multiple Audio mixers.

This completes the procedure for connecting multiple Remote Audio Mixers to a Synergy 100 MD switcher. Refer to the section "**Setting up Communication with a Remote Audio Mixer**" on page 9-15 for instructions on how to set up the communications protocols on the Synergy 100 MD switcher, as well as the Remote Audio Mixers.

Remote Audio Mixer Interface Cable Pinouts

Use the information in this section to connect the Synergy 100 MD switcher to the Remote Audio Mixer.

MIDIator Interface Cable Specifications

The serial cable that connects the MIDIator to the Peripheral Port on the Synergy 100 MD frame has the following pinouts.

Synergy 100 MD -to- MIDIator MS-124 Wiring Chart

Synergy Frame			MIDIator MS-124 Converter	
Peripheral Port	Signal		Cable Adapter	Signal
1	n/c			n/c
2	Rx	→	2	Tx
3	Tx	→	3	Rx
4	n/c			n/c
5	Ground	→	5	Ground
6	n/c			n/c
7	n/c			n/c
8	n/c			n/c
9	n/c			n/c

Graham-Patten D/ESAM-8000 Cabling

The serial cable that connects the Graham-Patten D/ESAM-8000 Remote Audio Mixer to the Peripheral Port on the Synergy 100 MD frame has the following pinouts.

Synergy 100 MD -to- Graham-Patten D/ESAM-8000 Wiring Chart

Synergy Frame			Graham-Patten D/ESAM-8000	
Peripheral Port	Signal		CPU Controller Edit Port	Signal
1	n/c		1	Frame Ground
2	TxA (Tx-)	→	8	RxA (Rx-)
3	RxB (Rx+)	→	7	TxB (Tx+)
4	Ground	→	4	Transmit Common
5	Ground	→	6	Receive Common
6	n/c		5	Spare
7	TxB (Tx+)	→	3	RxB (Rx+)
8	RxA (Rx-)	→	2	TxA (Tx-)
9	n/c		9	Frame Ground

Setting up Communication with a Remote Audio Mixer

In order to have the Synergy 100 MD switcher communicate with the Remote Audio Mixer, the peripheral port on the frame that the Audio Mixer is connected to must be set up to communicate with the particular Remote Audio Mixer you have connected.

⊛	**Important**	If you are connecting a Graham-Patten D/ESAM-8000 Audio Mixer, it is recommended that you first perform a software reset on the Synergy 100 MD switcher before setting up communications. Refer to the section "**Software Reset**" on page 4-6 for instructions.

Use the following procedure to set up communication with a Remote Audio Mixer:

1. Navigate to the **Communication Menu** as follows:

    *   Press **MENU** to display the **Main Menu**.

    *   Press **4. Communication** to display the **Communication Menu**.

```
Communication
0. Port    Periph1    5. Protocol   RS232
1. Type    Audio      6. Input      None
2. Device  Ya01V96    7. Monitor
3. Baud    38400      8. Option     Converter
4. Parity  None       9. Converter  MIDIator




MENU    100        10      1      SEL
Exit    Previous   Down    Up     Accept
```

Communication Menu — Audio Mixers

2. Select the peripheral port that is connected to the Audio Mixer as follows:

    *   Press **0. Port**.

    *   Use the ⬇ and ⬆ buttons to select the peripheral port on the Synergy 100 MD switcher that is connected to the Audio Mixer.

    *   Press the right **SEL** button to accept the new settings.

3. Assign a peripheral port to Audio as follows:

    *   Press **1. Type**.

    *   Use the ⬇ and ⬆ buttons to select **Audio**.

    *   Press the right **SEL** button to accept the new settings.

4. Select the device you want to assign to the Audio Mixer communications port as follows:

    *   Press **2. Device**.

    *   Use the ⬇ and ⬆ buttons to select the specific Audio Mixer you have connected to the peripheral port. You can choose between the following:

        ~   **Ya01V96** — Use this option to assign a Yamaha™ 01V96 Audio Mixer to the selected port.

        ~   **DSAM8000** — Use this option to assign a Graham-Patten D/ESAM-8000 Audio Mixer to the selected port.

- Press the right **SEL** button to accept the new settings.

5. Select the Baud rate for the Audio Mixer you have connected to the port as follows:

   - Press **3. Baud**.

   - Use the ⬇ and ⬆ buttons to select the baud rate for the Audio Mixer. Use the following settings for your specific Audio Mixer:

      ~ **Yamaha 01V96** — Set the baud rate to **38400** if you are connecting to the Audio Mixer through a MIDIator.

      ~ **Graham-Patten D/ESAM-8000** — The baud rate is locked to **38400** and can not be changed.

   - Press the right **SEL** button to accept the new settings.

6. Select the Parity for the Audio Mixer you have connected to the port as follows:

   - Press **4. Parity**.

   - Use the ⬇ and ⬆ buttons to select the parity for the Audio Mixer. Use the following settings for your specific Audio Mixer:

      ~ **Yamaha 01V96** — Set the parity to **None** if you are connecting to the Audio Mixer through a MIDIator.

      ~ **Graham-Patten D/ESAM-8000** — Set the parity to **Odd**.

   - Press the right **SEL** button to accept the new settings.

7. Select the communications protocol for the Audio Mixer you have connected to the port as follows:

   - Press **5. Protocol**.

   - Use the ⬇ and ⬆ buttons to select the communications protocol for the Audio Mixer. Use the following settings for your specific Audio Mixer:

      ~ **Yamaha 01V96** — Set the communications protocol to **RS232** if you are connecting to the Audio Mixer through a MIDIator.

      ~ **Graham-Patten D/ESAM-8000** — The communications protocol is locked to **RS422** and can not be changed.

   - Press the right **SEL** button to accept the new settings.

8. If you are connecting a **Yamaha 01V96** Audio Mixer, configure your options as follows:

   - Select the converter you want to use for communicating with the Audio Mixer as follows:

      ~ Press **8. Option**.

      ~ Use the ⬇ and ⬆ buttons to select **Converter**.

      ~ Press **9. Converter**.

      ~ Use the ⬇ and ⬆ buttons to select **MIDIator**.

      ~ Press the right **SEL** button to accept the new settings.

- Set the number of Audio Mixers you want to connect to your Synergy 100 MD switcher as follows:

Important

You will need to use a **MIDI Solutions Merger** to combine the inputs from the multiple Audio Mixers to a single input for the **MIDIator** that connects to your Synergy 100 MD switcher. Refer to the section "**Connecting Multiple Remote Audio Mixers**" on page 9-11 for information on connecting multiple Remote Audio Mixers.

~ Press **8. Option**.

~ Use the ⬇ and ⬆ buttons to select **Mixers**.

~ Press **9. Mixers**.

~ Use the ⬇ and ⬆ buttons to select the number of Remote Audio Mixers (to a maximum of 2) connected to your Synergy 100 MD switcher.

~ Press the right **SEL** button to accept the new settings.

9. If you are connecting a **Graham-Patten D/ESAM-8000** Audio Mixer and want to control individual channels on a single Logic Machine, complete your setup as follows:

Note

The Synergy 100 switcher can control 16 audio channels. Assign these 16 channels to two Logic Machines on the Graham-Patten D/ESAM-8000, 8 channels for each machine. Refer to your Graham-Patten documentation for information on Logic Machines.

- Press **8. Option**.
- Use the ⬇ and ⬆ buttons to select **Audio Unit**.
- Press **9. Audio Unit**.
- Use the ⬇ and ⬆ buttons to select **Channel**. This option enables you to control individual channels of two Logic Machines on the
- Press the right **SEL** button to accept the new settings.
- Press **8. Option**.
- Use the ⬇ and ⬆ buttons to select the Logic Machine you want to control the channels for from the Synergy 100 switcher. You can select from the following:
  ~ **Machine1** — Select this option to associate Machine1 of the Synergy 100 switcher with a Logic Machine on the D/ESAM-8000. Machine1 will control the first set of 8 channels.

  ~ **Machine2** — Select this option to associate Machine2 of the Synergy 100 switcher with a Logic Machine on the D/ESAM-8000. Machine2 will control the second set of 8 channels.
- Press the right **SEL** button to accept the new settings.
- Press **9. MachineX** (where **X** represents the machine number on the D/ESAM-8000).
- Use the ⬇ and ⬆ buttons to select the Logic Machine you wish to control with the Synergy 100 MD switcher. You can select Logic Machines **A** to **I** and **R**. These letters correspond to the Logic Machine you wish to control from the Synergy 100 switcher.
- Press the right **SEL** button to accept the new settings.

10. If you are connecting a **Graham-Patten D/ESAM-8000** Audio Mixer, and wish to control an entire Logic Machine, instead of its individual channels, from the Synergy 100 switcher, complete your setup as follows:

- Press **8. Option**.

- Use the ⬇ and ⬆ buttons to select **Audio Unit**.

- Press the right **SEL** button to accept the new settings.

- Press **9. Audio Unit**.

- Use the ⬇ and ⬆ buttons to select **Logic Machine**.

- Press the right **SEL** button to accept the new settings.

11. Press **MENU** to display the **Installation Change Screen**.

```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm              1. Cancel




                        10     1      SEL
                        Down   Up     Accept
```
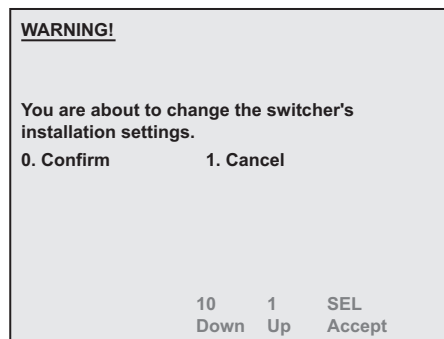
Installation Change Screen

12. Accept or cancel these changes as follows:

- Press **0. Confirm** to accept the changes.

- Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

✏️   **Note** | Ross Video recommends that you re-start the Synergy 100 switcher if you have toggled the Synergy **9. Audio Unit** menu option when setting up the Graham-Patten D/ESAM-8000. This will ensure the Synergy 100 switcher properly communicates with the Audio Mixer.

This completes the procedure for setting up communications with a Remote Audio Mixer. Next you must set up the Remote Audio Mixer to properly communicate with the switcher.

Setting up a Remote Audio Mixer

In order to complete the communications setup, you must configure the Remote Audio Mixer to accept commands and communicate with the switcher. This section covers setting up the following Audio Mixers:

- Yamaha 01V96

- Graham-Patten D/ESAM-8000

Yamaha 01V96

In order to allow the Synergy 100 MD switcher to communicate with the Audio Mixer, you must configure it as described in this section.

> ✎ **Note** For information on the Function Buttons and navigating the menu system on your Remote Audio Mixer, refer to the documentation that came with your Audio Mixer.

Use the following procedure to setup your Yamaha 01V96 Audio Mixer:

1. Press the **DIO/SETUP** function button in the **Display Access Group** to display the **DIO/SETUP Menu**.

2. Press the **MIDI/HOST** tab to display the **MIDI I/O HOST SETUP Menu**.

3. Use the **Cursor** buttons to navigate to the following (you will have to press **ENTER** after each selection):

   • **Tx PORT** — Use the Parameter Dial to set this to **MIDI**.

   • **Rx PORT** — Use the Parameter Dial to set this to **MIDI**.

4. Press the **MIDI** function button in the **Display Access Group** to display the **MIDI Menu**.

5. Press the **SETUP** tab to display the **MIDI SETUP Menu**.

6. Use the **Cursor** buttons to navigate to the following (you will have to press **ENTER** after each selection):

   • **Tx CH** — Use the Parameter Dial to set this to **1**.

   • **Rx CH** — Use the Parameter Dial to set this to **1**.

   • Use the following table to set the indicated parameters.

Yamaha 01V96 Setup

	Tx	Rx	OMNI	ECHO
Program Change	ON	ON	OFF	OFF
Control Change	ON	ON	OFF	--
Param Change	ON	ON	--	OFF
Bulk	--	OFF	--	--
Other Commands	--	--	--	OFF

   • **Fader Resolution** — Use the Parameter Dial to set this to **LOW**.

This completes the procedure for setting up the Remote Audio Mixer to communicate with the Synergy 100 MD switcher.

Graham-Patten D/ESAM-8000

In order to allow the Synergy 100 MD switcher to communicate with the Audio Mixer, you must configure it as follows:.

> ✎ **Note** For information on navigating the menu system on your Audio Mixer, refer to your Audio Mixer documentation.

- If the Synergy Peripheral Port is configured as **Channel**, by toggling the **9. Audio Unit** menu option, in the Synergy **Communication Menu**:

  ~ set the faders 1-8 on the D/ESAM-8000 to the 8 inputs of the Logic Machine you assigned to **Machine1** when configuring communications settings.

  ~ set faders 9-16 on the D/ESAM-8000 to the 8 inputs of the Logic Machine you assigned to **Machine2** when configuring communications settings.

- Manually set each fader to the desired level. The Synergy 100 MD switcher cannot control multi-fader levels for input channels directly, and will open and close the input channel at one level.

- If the Synergy Peripheral Port is configured as **LogicMachine**, by toggling the **9. Audio Unit** menu option, in the Synergy **Communication Menu**:

  ~ the Machine Name replaces the Channel and Group labels in the Synergy **Input Menu**.

  ~ when a BNC signal is taken on or off air, the associated Logic Machine and all of its channels is also taken on or off air.

Serial Tally Communication Setup

The **Serial Tally Interface** option allows you to set up communication parameters with tally system interface equipment using industry standard protocol.

✎	**Note**	The standard parallel tally interface will continue to operate normally when this option is enabled.

Serial Tally Menu Tree

The Serial Tally Menu allows you to set up the communication parameters you want to use for the tally system interface equipment.
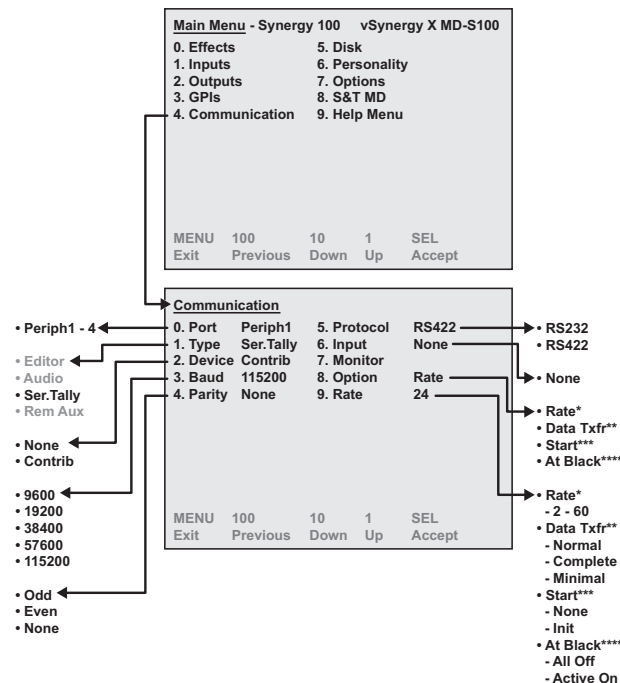
Communication Menu Tree — Serial Tally Setup

Serial Tally Setup

In order to connect a serial tally interface device to your Synergy 100 MD switcher, you will have to set up communication with the serial tally device.

✎	**Note**	The **Serial Tally Interface** option must be installed in order to set up and communicate with the editor.

Use the following procedure to set up a serial tally interface device:

1. Navigate to the **Communication Menu** as follows:

   • Press **MENU** to display the **Main Menu**.

   • Press **4. Communication** to display the **Communication Menu**.

```
Communication

0. Port     Periph1      5. Protocol   RS422
1. Type     Ser.Tally    6. Input      None
2. Device   Contrib      7. Monitor
3. Baud     115200       8. Option     Rate
4. Parity   Odd          9. Rate       24




MENU    100          10    1      SEL
Exit    Previous     Down  Up     Accept
```

Communication Menu — Serial Tally

2. Select the peripheral port that is connected to the serial tally interface device as follows:

    - Press **0. Port**.

    - Use the ⬇ and ⬆ buttons to select the peripheral port on the Synergy 100 MD switcher that is connected to the serial tally interface device.

    - Press the right **SEL** button to accept the new settings.

3. Assign a peripheral port to Serial Tally as follows:

    - Press **1. Type**.

    - Use the ⬇ and ⬆ buttons to select **Ser.Tally**.

    - Press the right **SEL** button to accept the new settings.

4. Select the device you want to assign to the serial tally communications port as follows:

    - Press **2. Device**.

    - Use the ⬇ and ⬆ buttons to select the specific serial tally protocol that you want to use to communicate with the serial tally interface device. You can choose between the following:

        ~   **None** — Use this option to not assign a communication protocol to the serial tally interface device connected to the selected port.

        ~   **Contrib** — Use this option to assign the contributional protocol to communicate with a serial tally interface device connected to the selected port.

    - Press the right **SEL** button to accept the new settings.

5. Select the Baud rate for the serial tally interface device you have connected to the port as follows:

    - Press **3. Baud**.

    - Use the ⬇ and ⬆ buttons to select the baud rate for the serial tally interface device. Refer to your serial tally interface device documentation for the baud rate for your device.

    - Press the right **SEL** button to accept the new settings.

6. Select the Parity for the serial tally interface device you have connected to the port as follows:

    - Press **4. Parity**.

    - Use the ⬇ and ⬆ buttons to select the parity for the serial tally interface device. Refer to your serial tally interface device documentation for the parity for your device.

- Press the right **SEL** button to accept the new settings.

7. Select the communications protocol for the serial tally interface device you have connected to the port as follows:

   - Press **5. Protocol**.

   - Use the ⬇ and ⬆ buttons to select the communications protocol for the serial tally interface device. Refer to your serial tally interface device documentation for the parity for your device. You can choose between the following:

     ~ **RS232** — Use this option if the editor uses the RS-232 communications protocol.

     ~ **RS422** — Use this option if the editor uses the RS-422 communications protocol.

   - Press the right **SEL** button to accept the new settings.

8. If you are using the **Contributional** protocol, you must set up the extra options for your serial tally interface device. Complete the procedure in the section "**Contributional Serial Tally Extra Options**" on page 9-23 to finish setting up your serial tally interface device. If you are not using the contributional protocol, proceed to the next step.
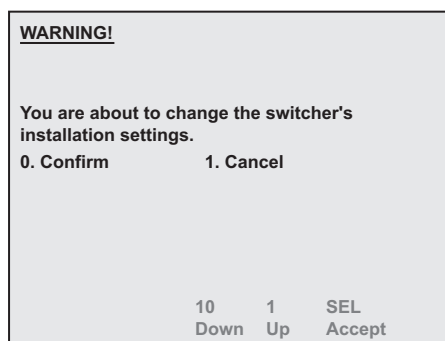
9. Press **MENU** to display the **Installation Change Screen**.

```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm         1. Cancel




                   10    1    SEL
                   Down  Up   Accept
```

Installation Change Screen

10. Accept or cancel these changes as follows:

    - Press **0. Confirm** to accept the changes.

    - Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for setting up a serial tally interface device on a peripheral port.

Contributional Serial Tally Extra Options

The **Contributional** protocol has extra options that must be set up to properly interface with a serial tally interface device.

Use the following procedure to set up the extra option for your serial tally interface device:

1. Ensure that the **Communication Menu** is displayed and that menu item **0. Port** is set to the serial tally interface device you want to set up the extra options for.

2. Assign a specific serial tally interface device to the selected peripheral port as follows:

   - Press **8. Option**.

   - Use the ⬇ and ⬆ buttons to select **Rate**.

• Press the right **SEL** button to accept the new settings.

✎ **Note** | When menu item **8. Option** is set to **Rate**, menu item **9. Reserved** changes to **9. Rate**.

• Press **9. Rate**.

• Use the ⬇ and ⬆ buttons to select the amount of time, in fields, between update messages being sent by the switcher to the serial tally interface device. You can choose between **2** and **60** fields.

• Press the right **SEL** button to accept the new settings.

3. Assign the number of messages that are sent to the serial tally interface device as follows:

• Press **8. Option**.

• Use the ⬇ and ⬆ buttons to select **Data Txfr**.

• Press the right **SEL** button to accept the new settings.

✎ **Note** | When menu item **8. Option** is set to **Data Txfr**, menu item **9. Reserved** changes to **9. Data Txfr**.

• Press **9. Data Txfr**.

• Use the ⬇ and ⬆ buttons to select the amount of switcher information that are sent to the serial tally interface device. You can choose between the following:

~ **Normal** — Use this option to have what is on the MLEs, Keys, and Aux buses, plus the names of the currently loaded stills sent to the serial tally interface device.

~ **Complete** — Use this option to have all switcher information sent to the serial tally interface device.

~ **Minimal** — Use this option to have only what is on MLEs and Keys sent to the serial tally interface device.

• Press the right **SEL** button to accept the new settings.

4. Assign whether or not an initialization message is sent to the serial tally interface device when the switcher starts sending data as follows:

• Press **8. Option**.

• Use the ⬇ and ⬆ buttons to select **Start**.

• Press the right **SEL** button to accept the new settings.

✎ **Note** | When menu item **8. Option** is set to **Start**, menu item **9. Reserved** changes to **9. Start**.

• Press **9. Start**.

• Use the ⬇ and ⬆ buttons to select whether or not an initialization message is sent when the switcher starts sending data. You can choose between the following:

~ **None** — Use this option to have no initialization message sent.

~ **Init** — Use this option to have an initialization message sent when the switcher starts sending data to the serial tally interface device.

- Press the right **SEL** button to accept the new settings.

5. Assign the messages that the switcher will sent to the serial tally interface device when the switcher is at black as follows:

   - Press **8. Option**.

   - Use the ⬇ and ⬆ buttons to select **At Black**.

   - Press the right **SEL** button to accept the new settings.

✎ **Note** When menu item **8. Option** is set to **At Black**, menu item **9. Reserved** changes to **9. At Black**.

   - Press **9. At Black**.

   - Use the ⬇ and ⬆ buttons to select what messages you want to send to the serial tally interface device when the switcher is at black. You can choose between the following:

      ~ **All Off** — Use this option to have the switcher report that nothing is on-air to the serial tally interface device.

      ~ **Active On** — Use this option to have the switcher not report any change to the serial tally interface device.

   - Press the right **SEL** button to accept the new settings.

6. Press **MENU** to display the **Installation Change Screen**.

```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm            1. Cancel




                      10      1      SEL
                      Down    Up     Accept
```
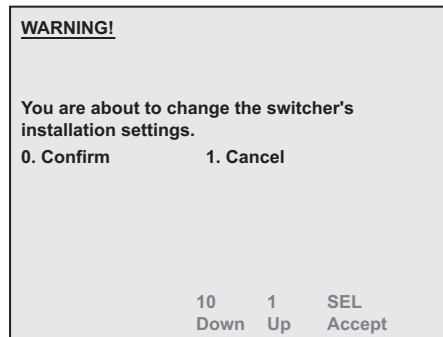
Installation Change Screen

7. Accept or cancel these changes as follows:

   - Press **0. Confirm** to accept the changes.

   - Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for setting up the extra options for a serial tally interface device.

Remote Aux Panels

In This Chapter

This chapter provides information for installing the Remote Aux Panels. The following topics are discussed:

- Remote Aux Panel Overview

- Installing Remote Aux Panels

- Setting Up Remote Aux Panels

ESD Susceptibility | Avoid handling any electronic circuit boards in high static environments, such as carpeted areas, and when wearing synthetic fiber clothing. Touch the frame to dissipate static charge before removing boards from the frame, and exercise proper grounding precautions when working on circuit boards.

Remote Aux Panel Overview

A Remote Aux Panel is a self-contained switching unit that has its own power supply. It mounts in a 19-inch rack and fills one Rack Unit (RU). The Remote Aux Bus Panel acts as a routing switcher, enabling you to assign any one of the possible sources on the panel, to any one of the Aux Buses. Typical applications include routing signals to one or more DVE channels, and switching a monitor between various signals.

Remote Aux Panel — Front View

The Remote Aux Panel includes dedicated buttons for Preview, Program, Clean Feed, and for accessing multiple Aux Bus Outputs — plus a bright "on-air" LED. The panel also includes source buttons plus **SHIFT**. Remote Aux Panel configuration (assignments to specific outputs and assignment of "rights") is performed using the menu system. Refer to the section, "**Remote Aux Communication Setup**" on page 10-6 for more information.
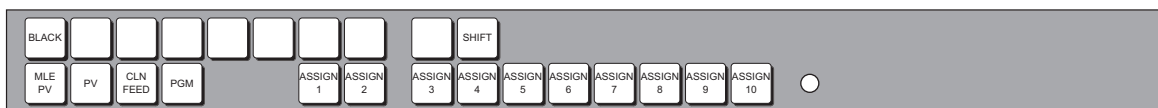
Remote Aux Panel — Front View

Remote Aux Panel crosspoint labels are provided with each panel. Refer to the section, "**Pushbutton Inserts**" on page 4-15 for labeling instructions.

Remote Aux Panel — Rear View

A Remote Aux Panel requires one Rack Unit (RU) of space for installation and a separate AC source for DC power.

Remote Aux Panel — Rear

1) Power Connector	3) Switcher (MAIN) Connector
2) GPI Connector	4) Remote (ECHO) Connector

1. Power Connector

One DC connector is provided for +5 VDC panel power.

2. GPI Connector

One 9-pin "D" GPI connector is provided for special GPI triggers that allow an operator to manually override the Aux panel selection. Refer to the section, "**Installing Remote Aux Panels**" on page 10-4 for connection details.

3. **Switcher (MAIN) Connector**

   One 6-pin RJ-12 Telco connector is provided for connecting to a Peripheral Port on the rear of the Synergy 100 MD frame. You will need an RJ-12 to DB9 convertor to connect to a Peripheral Port on the Synergy 100 MD frame.

4. **Remote (ECHO) Connector**

   One 6-pin RJ-12 Telco connector is provided for daisy-chaining the Remote Aux Panel to the next Remote Aux Panel in the chain.

Installing Remote Aux Panels

Remote Aux Panels connect to the rear of the Synergy 100 MD frame via a single six-conductor Telco control cable and a DB9 to RJ12 Adapter. You can daisy-chain up to 8 Remote Aux Panels to the Synergy 100 MD frame.

In order to properly complete this procedure, you need the following cables, and equipment:

- **Telco Control Cable** — This is a Telco cable with a six-pin RJ-12 Telco connector on both ends. You require one for each Remote Aux Panel.

- **AC Adapter** — One AC Adapter (90 - 264 VAC) is provided with each Remote Aux Panel as a source of +5 VDC.

- **DB9-to-RJ12 Aux Adapter** — This is a connector with a six-pin RJ-12 connector on one end, and a DB9 connector on the other. This adapter is included in the Installation Kit for your switcher.

Installing Remote Aux Panels

Use the following procedure to connect Remote Aux Panels to the Synergy 100 MD frame:

Note — As the Synergy 100 MD frame does not have a dedicated **AUX** port, an **DB9-to-RJ12 Aux Adapter** is required when connecting Remote Aux Panels to the Synergy 100 MD frame.

1. Connect the **DB9** end of the **DB9-to-RJ12 Aux Adapter** to a **Peripheral Port** on the rear of the Synergy 100 MD frame.

2. Ensure that you have the correct 6-pin shielded Telco cable, with 6-pin RJ-12 connectors at each end.

3. Connect the **Telco Control Cable** to the **DB9-to-RJ12 Aux Adapter** installed in the **Peripheral Port**.

4. Connect the other end of the **Telco Control Cable** to the **Switcher (MAIN)** port on the rear of the first Remote Aux Panel in the daisy-chain.

CPU Board — Synergy MD Frame

Remote Aux Panel

To Remote (ECHO) connector on the next Remote Aux Panel in the chain, or no connection if the last panel in the chain.
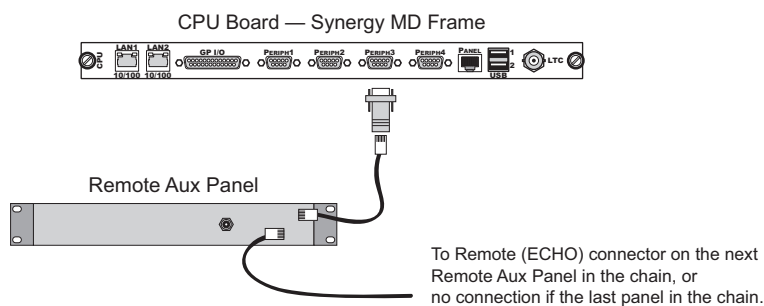
Remote Aux Panel to Synergy 100 MD Frame

5. If you are connecting multiple Remote Aux Panels in a daisy-chain:

- Connect a second **Telco Control Cable** to the **Remote (ECHO)** port on the Remote Aux Panel.

- Connect the other end of the **Telco Control Cable** to the **Switcher (MAIN)** port on the back of the second Remote Aux Panel in the daisy-chain.

- Repeat for all additional Aux panels in the daisy-chain up to a maximum of 8 panels per chain.

6. Connect the AC Adapter as follows:

- Connect the supplied AC Adapter to a suitable source of line voltage.

- Plug the DC connector into the rear of the Remote Aux Panel.

- Repeat for each Remote Aux Panel.

This completes the procedure for connecting Remote Aux Panels to the Synergy 100 MD frame.

Remote Aux Communication Setup

As the Synergy 100 MD frame does not have a dedicated **AUX** Port, you must configure the **Peripheral Port** to communicate with the Remote Aux Panel.

Use the following procedure to set up a Peripheral Port for a Remote Aux Panel:

1. Navigate to the **Communication Menu** as follows:

   • Press **MENU** to display the **Main Menu**.

   • Press **4. Communication** to display the **Communication Menu**.

```
Communication

0. Port     Periph3     5. Protocol
1. Type     Rem Aux     6. Input
2. Device Rem Aux       7. Monitor
3. Baud                 8. Option
4. Parity               9. Reserved




MENU    100         10     1      SEL
Exit    Previous    Down   Up     Accept
```

Communication Menu — Remote Aux Panel

2. Select the Peripheral Port that is connected to the Remote Aux Panel as follows:

   • Press **0. Port**.

   • Use the ⬇ and ⬆ buttons to select the Peripheral Port on the Synergy MD frame that is connected to the Remote Aux Panel.

   • Press the right **SEL** button to accept the new settings.

3. Assign the Peripheral Port to Remote Aux as follows:

   • Press **1. Type**.

   • Use the ⬇ and ⬆ buttons to select **Rem Aux**.

   • Press the right **SEL** button to accept the new settings.

4. Select the device you want to assign to the Peripheral Port as follows:

   • Press **2. Device**.

   • Use the ⬇ and ⬆ buttons to select **Rem Aux**.

5. Press **MENU** to display the **Installation Change Screen**.

6. Accept or cancel these changes as follows:

   • Press **0. Confirm** to accept the changes.

   • Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for setting up a Peripheral Port for a Remote Aux Panel.

Setting Up Remote Aux Panels

In order to operate the Remote Aux Panel, you must program the access rights for each Aux Bus output. This section outlines how to set up the Aux Bus output that a specific Remote Aux Panel controls, and to program the access "rights" for each Aux Bus output.

With the programming mode in effect, selected buttons (or crosspoints) on each panel now represent the Aux Bus outputs. Currently, the Remote Aux Panel includes Aux Assign buttons that represent the 10 Aux Bus outputs, respectively.

Setting up Remote Aux Panels

Use the following procedure to set up your Remote Aux Panels:

1. As required, refer to your **Output Worksheet** located in the section, "**Output Worksheet**" on page 19-3.

2. Navigate to the **Output Setup Menu** as follows:

    •   Press **MENU** to display the **Main Menu**.

    •   Press **2. Outputs** to display the **Outputs Menu**.

    •   Press **1. Output Setup** to display the **Output Setup Menu**.

    ```
    Output Setup
    0. Clean           BeforeKey
    1. MultiDSK        Off
    2. RemAuxPrg       Off




    MENU    100       10     1      SEL
    Exit    Previous  Down   Up     Accept
    ```

    Output Setup Menu

3. Toggle the **2. RemAuxPrg** to enable Remote Aux Panel programming as follows:

    •   **On** — Use this option to enable the Remote Aux Panel programming mode. When **RemAuxPrg** is set to **On**, the following actions occur:

        ~   All Remote Aux Panels are placed in "programming" mode.

        ~   On all Remote Aux Panels, the on-air LED flashes to alert you that programming mode is now in effect.

    •   **Off** — Use this option to disable the Remote Aux Panel programming mode. This is the default setting.

✓ **Operating Tip**

> It is unnecessary to physically return the setting to **Off** when programming is complete. Simply exit the menu system. The Remote Aux Panel will automatically exit programming mode and the **RemAuxPrg** heading will be set to **Off**.

4. To assign the "rights", perform the following steps at *each* Remote Aux Panel connected to the Synergy 100 MD switcher.

   • Ensure that the panel is in "programming" mode. The LED on the Remote Aux Panel now flashes.
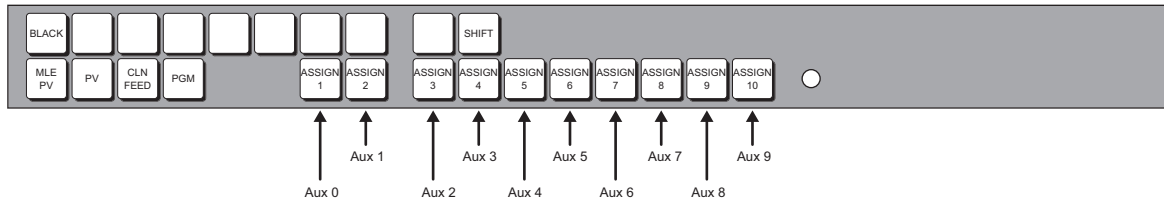
Remote Aux Panel — ASSIGN Buttons

   • Press the **ASSIGN** (**1-10**) button on the Remote Aux Panel that corresponds to the Aux Bus that you want to program. Note that each press of the button toggles between two states:

     ~ **On** — When a button is lit steadily, the associated Aux Bus is in "full access" or "regular" mode. The Aux Bus can be selected and sources (crosspoints) can be changed from both the Remote Aux Panel and the *local* control panel.

     ~ **Flashing** — When a button is flashing, the associated Aux Bus is in "follow" or "view only" mode. You can select the bus and follow what crosspoints are being selected (remotely, by another user), but you cannot change crosspoints on the current panel.

   • Repeat for each of the Aux Buses.

5. Press **MENU** to display the **Installation Change Screen**.

6. Accept or cancel these changes as follows:

   • Press **0. Confirm** to accept the changes.

   • Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.
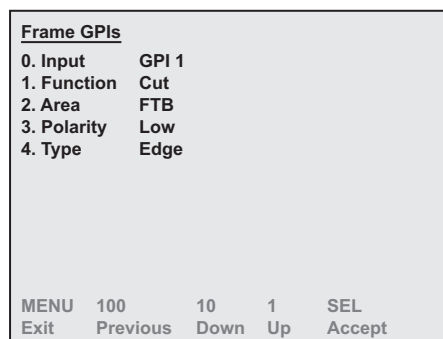
This completes the procedure to set up your Remote Aux Panels. All Remote Aux Panels return to their normal operating mode. In addition, the new "rights" for a programmed Remote Aux Panel are now stored in the non-volatile memory of that Remote Aux Panel.

Completing Setup

In This Chapter

This chapter provides instructions for setting up standard GPIs, factory defaults, audio channel setup, as well as setting up switcher personalities.

The following topics are discussed:

- GPI Setup Menu Tree
- Standard GPI Input Worksheet
- Programming Standard GPI Inputs
- Reference
- Factory Defaults
- Audio Channel Setup
- Setting Up Audio Channel Levels
- Setting Up Audio Channel Groups

GPI Setup Menu Tree

The figure below illustrates the portion of the menu tree that is used for GPI setup procedures. Use this figure for reference in this section.
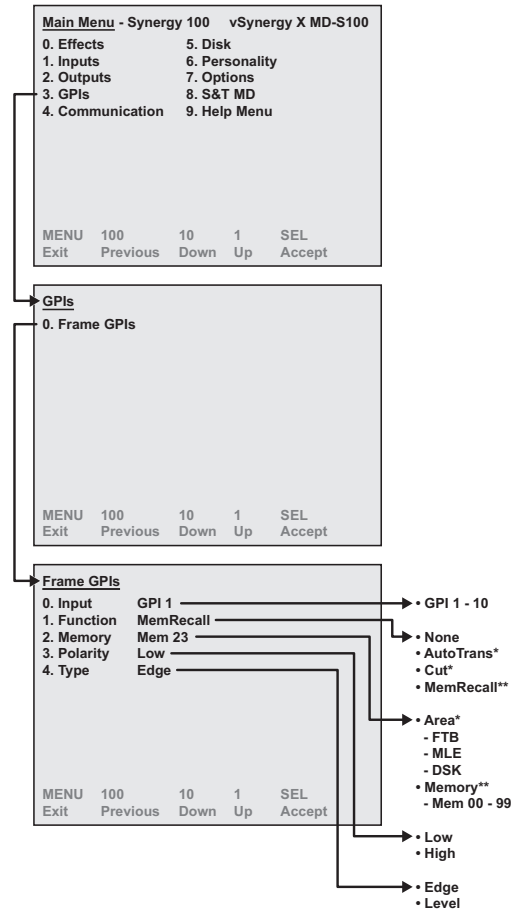
GPI Setup Menu Tree

| ✎ | Note | When menu item **1. Function** is set to **MemRecall**, menu item **2.** changes to **2. Memory**. If menu item **1. Function** is set to **AutoTrans** or **Cut**, menu item **2.** changes to **2. Area**. |

Standard GPI Input Worksheet

The **GPIs Menu** allows you to set up your **10** GPI Inputs on the **GPI I/O** connector on the back of the CPU Board on the frame.

To avoid marking up the *Engineering Manual*, use the worksheet provided in Appendix C, "**Installation Worksheets**" to make extra copies.

Standard GPI Input Worksheet

Standard GPI Input #	Event Type	Event Area	Polarity
Sample GPI Input #1	AutoTrans	MLE	Edge
Sample GPI Input #2	Cut	FTB	Level
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

GPI Setup

In order to be able to use the GPI features of the switcher, you must turn the GPI functionality on.

Use the following procedure to activate the GPI functionality on the Synergy 100 MD Switcher:

1. Navigate to the **Effects Menu** as follows:

    • Press **MENU** to display the **Main Menu**.

    • Press **0. Effects** to display the **Effects Menu**.

```
Effects

0. Editor          On       5. UltraChrome Parameters
1. GPIs            Off      6. Global-Store
2. Center          Off      7. MultiDSK
3. Safe Title      Off
4. Reserved




MENU   100           10     1      SEL
Exit   Previous      Down   Up     Accept
```
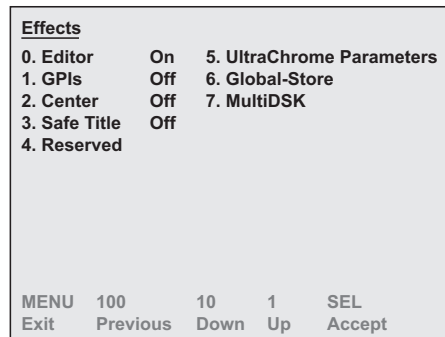
Effects Menu

2. Activate the GPI feature as follows:

    • Press **1. GPIs**.

    • Use the ⬇ and ⬆ buttons to turn the GPI feature On or Off.

        ~ **On** — When the GPIs feature is on, you can use the GPI feature to trigger events on the switcher.

        ~ **Off** — When the GPI feature is off, all GPI signals will be ignored.

    • Press the right **SEL** button to accept the new settings.

3. Press **MENU** to display the **Installation Change Screen**.
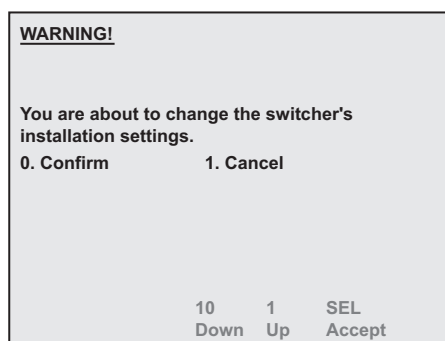
```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm              1. Cancel






                        10     1      SEL
                        Down   Up     Accept
```

Installation Change Screen

4. Accept or cancel these changes as follows:

    • Press **0. Confirm** to accept the changes.

    • Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for activating the GPI functionality.

Programming Standard GPI Inputs

The **Frame GPIs Menu** allows you to set up each of the **10** GPIs on the Synergy 100 MD frame. GPIs use electrical signals sent from external devices to trigger specific events on the switcher. For example, you can set up a GPI to trigger an MLE transition on the switcher. Once set up, every time the assigned GPI port receives the proper trigger signal, the switcher will perform an MLE transition.

There are two types of GPI inputs, Transition GPIs and Memory Recall GPIs. The Transition GPI triggers tell the switcher to perform a transition in the selected area when the GPI pulse is received. Memory Recall GPI trigger tell the switcher to recall a specific memory register when the GPI pulse is received.

Setting up Transition GPI Inputs

Use the following procedure to set up a transition Input GPI trigger:

1. Navigate to the **Frame GPIs Menu** as follows:

    *   Press **MENU** to display the **Main Menu**.
    *   Press **3. GPIs** to display the **GPIs Menu**.
    *   Press **0. Frame GPIs** to display the **Frame GPIs Menu**.

    ```
    Frame GPIs
    0. Input        GPI 1
    1. Function     Cut
    2. Area         FTB
    3. Polarity     Low
    4. Type         Edge




    MENU    100           10      1       SEL
    Exit    Previous      Down    Up      Accept
    ```

    Frame GPIs Menu

2. Select the GPI you want to set up as follows:

    *   Press **0. Input**.
    *   Use the ⬇ and ⬆ buttons to select the GPI you want to assign the event to.
    *   Press the right **SEL** button to accept the new settings.

3. Select the transition function you want to assign to the GPI input as follows:

    *   Press **1. Function**.
    *   Use the ⬇ and ⬆ buttons to select the function you want to assign to the selected GPI input. You can choose between the following:
        ~   **None** — Use this option to have no action taken when a signal is received by the select GPI.
        ~   **AutoTrans** — Use this option to have an **Auto Transition** performed when a signal is received by the selected GPI.
        ~   **Cut** — Use this option to have a **Cut** performed when a signal is received by the selected GPI.
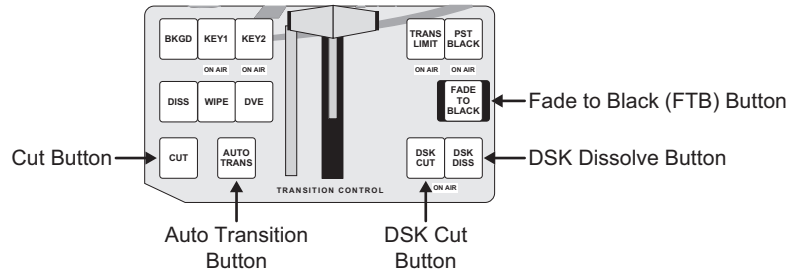
GPI Trigger Functions — Transition Control Group

- ~ **MemRecall** — Use this option to have a **Memory Recalled** when a signal is received by the selected GPI. Refer to the section "**Setting up Memory GPI Inputs**" on page 11-7 for information on setting up a Memory Recall GPI.

- • Press the right **SEL** button to accept the new settings.

4. Select the area you want the transition to be performed in as follows:

   - • Press **2. Area**.

   - • Use the ⬇ and ⬆ buttons to select the area you want the transition to be performed in. You can choose between the following:

      - ~ **MLE** — Select this option to have the transition performed in the **MLE**. This will perform a transition according to what is set in the **Transition Control Group**. For example, if the **BKGD** and **KEY2** buttons are lit, the transition will be performed on both the **Background** bus and **Key 2** bus.

      - ~ **FTB** — Select this option to have a **Fade to Black** transition performed. This will either take the output of the switcher to black, or take it from black if the Fade to Black is already active.

      - ~ **DSK** — Select this option to have the transition performed in the **Downstream Keyer**. This will perform a transition of the **Downstream Keyer**, either taking the DSK on-air or off-air.

   - • Press the right **SEL** button to accept the new settings.

5. Select the polarity of the GPI signal that will trigger the function as follows:

   - • Press **3. Polarity**.

   - • Press the right **SEL** button to select either **Low** or **High**.

      - ~ **Low** — Select this option to have the function trigger when a low GPI signal, or ground, is received. If the static GPI signal is high, the function will be triggered when it goes low.

      - ~ **High** — Select this option to have the function trigger when a high GPI signal is received. If the static GPI signal is ground, the function will be triggered when it goes high.

6. Select the Type of the GPI trigger signal that will trigger the function as follows:

   - • Press **4. Type**.

   - • Press the right **SEL** button to select either **Edge** or **Level**.

      - ~ **Edge** — Select this option if the GPI trigger signal consists of a momentary change in polarity and then returns to the static GPI signal. For example, if the static signal is low, the trigger will be a high and then it will return to the low static signal.

~ **Level** — Select this option if the GPI trigger signal consists of a permanent change in polarity. For example, if the static signal is low, the trigger will be a high and then the signal will remain high.

7. Press **MENU** to display the **Installation Change Screen**.

```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm              1. Cancel




                           10    1    SEL
                           Down  Up   Accept
```

Installation Change Screen

8. Accept or cancel these changes as follows:

   • Press **0. Confirm** to accept the changes.

   • Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for setting up a transition Input GPI trigger.

Setting up Memory GPI Inputs

Use the following procedure to set up a memory recall Input GPI trigger:

1. Navigate to the **Frame GPIs Menu** as follows:

   • Press **MENU** to display the **Main Menu**.

   • Press **3. GPIs** to display the **GPIs Menu**.

   • Press **0. Frame GPIs** to display the **Frame GPIs Menu**.

```
Frame GPIs
0. Input       GPI 1
1. Function    Cut
2. Area        FTB
3. Polarity    Low
4. Type        Edge




MENU   100         10    1    SEL
Exit   Previous    Down  Up   Accept
```

Frame GPIs Menu

2. Select the GPI you want to set up as follows:

   • Press **0. Input**.

   • Use the ⬇ and ⬆ buttons to select the GPI you want to assign the event to.

   • Press the right **SEL** button to accept the new settings.

3. Select the transition function you want to assign to the GPI input as follows:

- Press **1. Function**.
- Use the ⬇ and ⬆ buttons to select the function you want to assign to the selected GPI input. You can choose between the following:
    - **None** — Use this option to have no action taken when a signal is received by the select GPI.
    - **AutoTrans** — Use this option to have an **Auto Transition** performed when a signal is received by the selected GPI. Refer to the section "**Setting up Transition GPI Inputs**" on page 11-5 for information on setting up a Transition GPI.
    - **Cut** — Use this option to have a **Cut** performed when a signal is received by the selected GPI. Refer to the section "**Setting up Transition GPI Inputs**" on page 11-5 for information on setting up a Transition GPI.
    - **MemRecall** — Use this option to have a **Memory Recalled** when a signal is received by the selected GPI.

4. Select the Memory to be recalled as follows:

- Press **2. Memory**.
- Use the ⬇ and ⬆ buttons to select the memory register you want to recall.
- Press the right **SEL** button to accept the new settings.

5. Select the polarity of the GPI signal that will trigger the function as follows:

- Press **3. Polarity**.
- Press the right **SEL** button to select either **Low** or **High**.
    - **Low** — Select this option to have the function trigger when a low GPI signal, or ground, is received. If the static GPI signal is high, the function will be triggered when it goes low.
    - **High** — Select this option to have the function trigger when a high GPI signal is received. If the static GPI signal is ground, the function will be triggered when it goes high.

6. Select the Type of the GPI trigger signal that will trigger the function as follows:

- Press **4. Type**.
- Press the right **SEL** button to select either **Edge** or **Level**.
    - **Edge** — Select this option if the GPI trigger signal consists of a momentary change in polarity and then returns to the static GPI signal. For example, if the static signal is low, the trigger will be a high and then it will return to the low static signal.
    - **Level** — Select this option if the GPI trigger signal consists of a permanent change in polarity. For example, if the static signal is low, the trigger will be a high and then the signal will remain high.

7. Press **MENU** to display the **Installation Change Screen**.

```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm            1. Cancel




                            10    1    SEL
                            Down  Up   Accept
```

Installation Change Screen

8. Accept or cancel these changes as follows:

- Press **0. Confirm** to accept the changes.

- Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for setting up a memory recall Input GPI trigger.

Reference

The Flexible Reference system in the Synergy 100 MD switcher allows you to use any **Interlaced** video format as reference to operate the switcher in any video format of the same frequency. For example, if you have a 1080i 59.94Hz input reference you can operate the switcher in 720p 59.94Hz, but not 1080i 50Hz. If you need to change frequencies, you can have multiple input references and use one or the other.

Compatible Video Formats

The following table lists the video formats you can use with the different reference types.

Compatible Video Formats

Input Reference	Usable Formats
480i	• 480i • 480i/16:9 • 1080i 59.94 Hz
576i	• 576i • 576i/16:9 • 1080i 50 Hz
720p 50 Hz	• 720p 50 Hz
720p 59.94 Hz	• 720p 59.94 Hz
1080p 24 Hz	• 1080p 24 Hz
1080i 59.94 Hz	• 480i • 480i/16:9 • 720p 59.94 Hz • 1080i 59.94 Hz
1080i 50 Hz	• 576i • 576i/16:9 • 720p 50 Hz • 1080i 50 Hz
1080pSF 24 Hz	• 1080pSF 24 Hz
1080pSF 23.98 Hz	• 1080pSF 23.98 Hz

The Synergy 100 MD switcher allows you to use any interlaced video format to operate the switcher in any format of the same frequency; however, the use of 480i or 576i (Composite Sync) reference signals for High Definition (720p or 1080i) video modes is not recommended. Using a composite sync reference signal for High Definition video modes will result in excessive jitter on the video output of the switcher, falling outside the range specified by SMPTE-292M. This may result in downstream equipment being unable to properly receive these signals.

The use of composite sync reference formats is recommended for Standard Definition video modes, and will provide stable outputs with jitter performance in compliance with SMPTE-259M specifications.

Reference Setup

Use the following procedure to set the reference format of the switcher:
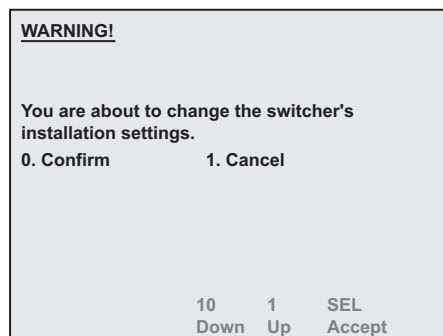
1. Navigate to the **Reference Menu** as follows:

   - Press **MENU** to display the **Main Menu**.

   - Press **1. Inputs** to display the **Inputs Menu**.

   - Press **4. Reference** to display the **Reference Menu**.

   ```
   Reference
   0. Ref Format      1080i 59.94
   1. Input Ref       Board C
   2. Video Format    1080i 59.94
   3. Reference       Int
        Format: 1080i 59.94
        30 frames/sec – 60 fields/sec
        Scan Type: Interlaced
        Full Frame Res: 2200×1125
        Active Video: 1920×1080
        Switching Line: 7/569
        Pixel Aspect Ratio: 1.00
   MENU    100        10      1     SEL
   Exit    Previous   Down    Up    Accept
   ```
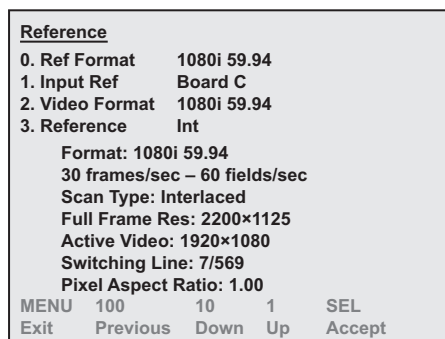
   Reference Menu

   The **Reference Menu** displays the selected video format that the switcher is operating in. Below this line you have the **frequencies**, **scan type**, **resolutions**, **switching lines** and **pixel aspect ratio**. This information will be updated when you change the video format of the switcher.

2. Select the Video Input Board that is providing the reference as follows:

   - Press **1. Input Ref**.
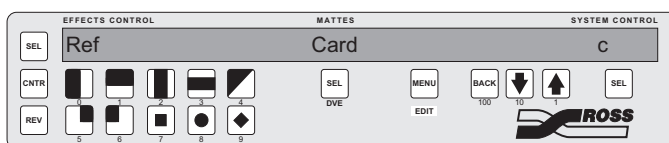
   Menu Control Group Display — Video Input Board

   When you press **1. Input Ref**, the display in the **Menu Control Group** changes to show you the currently selected Video Input Board.

   - Use the ⬇ and ⬆ buttons to select the Video Input Board you have connected the reference to. You can choose between the following:

     ~ **Board C** — Select this option to use the reference signal that is connected to the Video Input Board that is installed in **Slot C** at the back of the frame.

   - Press the right **SEL** button to accept the change.

3. Select the reference format for the switcher as follows:

   - Press **0. Ref Format**.
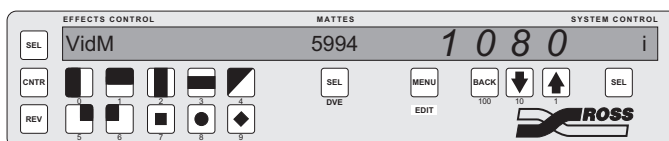
   Menu Control Group Display — Reference Format

When you press **0. Ref Format**, the display in the **Menu Control Group** changes to show you the currently selected input reference format.

• Use the ⬇ and ⬆ buttons to select the reference format of the input reference. You can choose between the following:

> ⚠ **Important** | Although a Standard Definition (Composite Sync) reference signal can be used for High Definition video formats, it not recommended. For more information on compatible video formats, refer to the section "**Compatible Video Formats**" on page 11-10.

~ **480i** — Select this option if the reference you have connected to the Video Input Board is **480** interlaced in a **4:3** aspect ratio.

~ **480i 16:9** — Select this option if the reference you have connected to the Video Input Board is **480** interlaced in a **16:9** aspect ratio.

~ **576i** — Select this option if the reference you have connected to the Video Input Board is **576** interlaced in a **4:3** aspect ratio.

~ **576i 16:9** — Select this option if the reference you have connected to the Video Input Board is **576** interlaced in a **16:9** aspect ratio.

~ **720p 59.94** — Select this option if the reference you have connected to the Video Input Board is **720** progressive at a frequency of **59.94 Hz**.

~ **720p 50** — Select this option if the reference you have connected to the Video Input Board is **720** progressive at a frequency of **50 Hz**.

~ **1080i 59.94** — Select this option if the reference you have connected to the Video Input Board is **1080** interlaced at a frequency of **59.94 Hz**.

~ **1080i 50** — Select this option if the reference you have connected to the Video Input Board is **1080** interlaced at a frequency of **50 Hz**.

~ **1080pSF 24** — Select this option if the reference you have connected to the Video Input Board is **1080** progressive segmented frames at a frequency of **24 Hz**.

~ **1080pSF 23.98** — Select this option if the reference you have connected to the Video Input Board is **1080** progressive segmented frames at a frequency of **23.98 Hz**.

~ **1080p 24** — Select this option if the reference you have connected to the Video Input Board is **1080** progressive at a frequency of **24 Hz**.

• Press the right **SEL** button to accept the change.

> ✎ **Note** | When you select the new reference format the menus displayed on the preview overlay may appear distorted. The switcher will adjust the preview overlay when you confirm the new reference format.

4. Select the video format for the switcher as follows:

✎	**Note**	You must use a reference format for the switcher that is of the same frequency as the input reference signal. For example, you can use a 1080i 50 Hz reference for 720p 50Hz, but not for 720p 59.94Hz.

- Press **2. Video Format**.
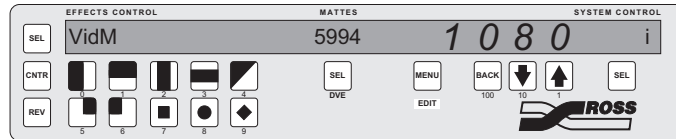
Menu Control Group Display — Reference Format

When you press **2. Video Format**, the display in the **Menu Control Group** changes to show you the currently selected video format that the switcher is operating in.

- Use the ⬇ and ⬆ buttons to select the video format you want the switcher to operate in. You can choose between the following:

✓	**Operating Tip**	If you are unable to view the reference list on the preview overlay, press the ⬇ button **9** times, this will put it at the top of the list (480i). Now use the ⬆ button to count down from 480i to the reference you want to use.

- ~ **480i** — Select this option if the reference you have connected to the Video Input Board is **480** interlaced in a **4:3** aspect ratio.

- ~ **480i 16:9** — Select this option if the reference you have connected to the Video Input Board is **480** interlaced in a **16:9** aspect ratio.

- ~ **576i** — Select this option if the reference you have connected to the Video Input Board is **576** interlaced in a **4:3** aspect ratio.

- ~ **576i 16:9** — Select this option if the reference you have connected to the Video Input Board is **576** interlaced in a **16:9** aspect ratio.

- ~ **720p 59.94** — Select this option if the reference you have connected to the Video Input Board is **720** progressive at a frequency of **59.94 Hz**.

- ~ **720p 50** — Select this option if the reference you have connected to the Video Input Board is **720** progressive at a frequency of **50 Hz**.

- ~ **1080i 59.94** — Select this option if the reference you have connected to the Video Input Board is **1080** interlaced at a frequency of **59.94 Hz**.

- ~ **1080i 50** — Select this option if the reference you have connected to the Video Input Board is **1080** interlaced at a frequency of **50 Hz**.

- ~ **1080pSF 24** — Select this option if the reference you have connected to the Video Input Board is **1080** progressive segmented frames at a frequency of **24 Hz**.

- ~ **1080pSF 23.98** — Select this option if the reference you have connected to the Video Input Board is **1080** progressive segmented frames at a frequency of **23.98 Hz**.

~ **1080p 24** — Select this option if the reference you have connected to the Video Input Board is **1080** progressive at a frequency of **24 Hz**.

• Press the right **SEL** button to accept the change.

Note

When you select the new reference format the menus displayed on the preview overlay may appear distorted. The switcher will adjust the preview overlay when you confirm the new reference format.

5. Press **MENU** to display the **Installation Change Screen**.
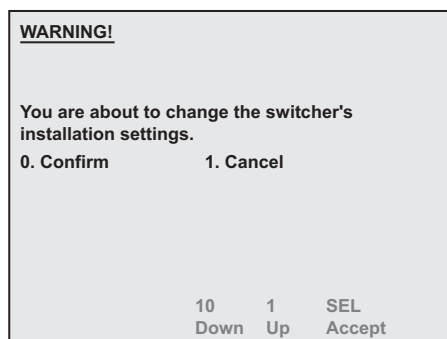
```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm              1. Cancel




                        10     1     SEL
                        Down   Up    Accept
```

Installation Change Screen

6. Accept or cancel these changes as follows:

• Press **0. Confirm** to accept the new reference format.

• Press **1. Cancel** to reject the changes and return to the previous reference format.

This completes the procedure for setting the reference format for the switcher.

Internal and External Reference

Normally, you use an externally generated reference to synchronize the switcher's video signals. However, Synergy 100 MD switchers can generate an internal reference signal for use when no external reference is present. This is useful for demonstration or testing purposes and is not intended for production applications. The internal reference signal can only synchronize internally generated sources, such as Global-Stores. External crosspoints can not be synchronized to an internal reference signal.

The Synergy 100 MD switcher can generate the following internal reference signals:

• **1080i 59.94** — This signal generates an internal reference of **1080** interlaced at a frequency of **59.94 Hz**.

• **1080i 50** — This signal generates an internal reference of **1080** interlaced at a frequency of **50 Hz**.

Use the following procedure to change between internal and external reference signals:

Important

Internally generated reference signals can not synchronize external video sources. Do not use an internally generated reference signal for production work.

1. Navigate to the **Reference Menu** as follows:

• Press **MENU** to display the **Main Menu**.

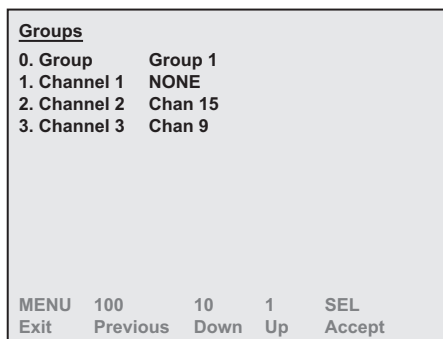- Press **1. Inputs** to display the **Inputs Menu**.
- Press **4. Reference** to display the **Reference Menu**.

```
Reference
0. Ref Format      1080i 59.94
1. Input Ref       Board C
2. Video Format    1080i 59.94
3. Reference       Int
       Format: 1080i 59.94
       30 frames/sec – 60 fields/sec
       Scan Type: Interlaced
       Full Frame Res: 2200×1125
       Active Video: 1920×1080
       Switching Line: 7/569
       Pixel Aspect Ratio: 1.00
MENU   100        10      1      SEL
Exit   Previous   Down    Up     Accept
```
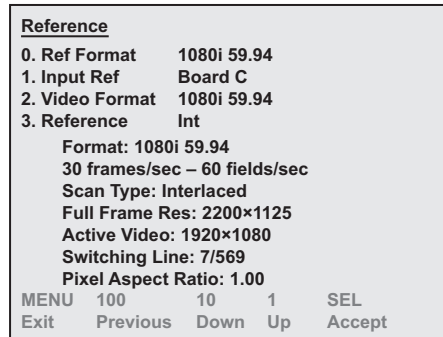
Reference Menu

2. Toggle between internally generated and externally generated reference signals as follows:

- Press **3. Reference**.

- Use the ⬇ and ⬆ buttons to toggle between the reference signals. You can choose between the following:

    ~ **Int** — Use this option to select the internal reference signal. Selecting an internal reference signal limits the options available on the **0. Ref Format** menu to **1080i 59.94**, and **1080i 50**.

    ~ **Ext** — Use this option to select the external reference signal. Selecting an external reference signal allows all the options on the **0. Ref Format** menu as described in the section "**Reference Setup**" on page 11-11.

- Press the right **SEL** button to accept the changes.

3. Press **MENU** to display the **Installation Change Screen**.

```
WARNING!


You are about to change the switcher's
installation settings.
0. Confirm            1. Cancel




                      10      1      SEL
                      Down    Up     Accept
```

Installation Change Screen

4. Accept or cancel these changes as follows:

- Press **0. Confirm** to accept the new reference setting.

- Press **1. Cancel** to reject the changes and return to the previous reference setting.

This completes the procedure for changing between internal and external reference signals.

Factory Defaults

This section provides information for recalling the factory defaults and resetting the Input and Output BNCs using the **System Resets Menu** in the **Options Menu**.

Recalling Factoring Defaults

This section provides information and instructions for reverting the switcher to the factory default settings. These values are *preset* at the factory and can only be overwritten by the user.

Use the following procedure to recall the factory default settings:

> ✎ **Note**   When a Factory Recall is performed there will be a **10** second pause as the switcher recalls the default settings.

1. Navigate to the **System Resets Menu** as follows:

    *   Press **MENU** to display the **Main Menu**.
    *   Press **7. Options** to display the **Options Menu**.
    *   Press **5. System Resets** to display the **System Resets** menu.

    ```
    System Resets
    0. All
    1. System Shutdown
    2. System Restart
    3. Inputs/Outputs
    4. Restart Global-Store




    MENU    100       10     1     SEL
    Exit    Previous   Down   Up    Accept
    ```
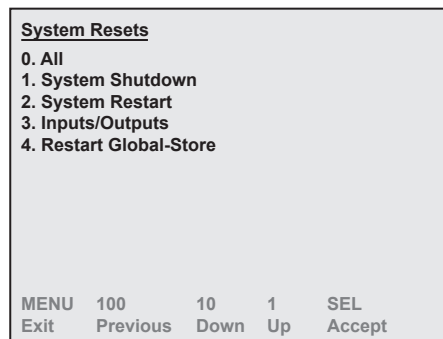
    System Resets Menu

2. Press **0. All** to display the **Reset Factory Defaults Confirmation Screen**.

    ```
    This function will reset the switcher to its
    Factory Defaults.
    Are you certain you want to do this?

    0. Confirm          1. Cancel




                         10     1     SEL
                         Down   Up    Accept
    ```
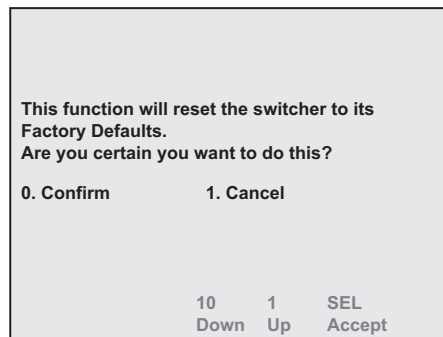
    Reset Factory Defaults Confirmation Screen

3. Press **0. Confirm** to restore the default factory settings for the switcher.

> ✓ **Operating Tip**   Press **1. Cancel** to *not* restore the default factory settings and return to the **System Resets Menu**.

This completes the procedure for reverting the switcher to the default factory settings.

Resetting the Input and Output BNCs

The **System Resets Menu** includes an option that allows you to set all inputs and output BNCs to the system video format.

Use the following procedure to set all inputs and output BNCs to the system video format:

1. Navigate to the **System Resets Menu** as follows:

   • Press **MENU** to display the **Main Menu**.

   • Press **7. Options** to display the **Options Menu**.

   • Press **5. System Resets** to display the **System Resets** menu.

```
System Resets
0. All
1. System Shutdown
2. System Restart
3. Inputs/Outputs
4. Restart Global-Store




MENU    100       10     1      SEL
Exit    Previous   Down   Up     Accept
```
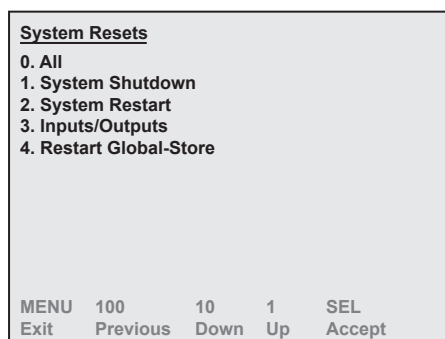
System Resets Menu

2. Press **3. Inputs/Outputs** to display the **Inputs/Outputs Confirmation Screen**.

3. Press **0. Confirm** to set all input and output BNCs to the system video format.

✓ | **Operating Tip** | Press **1. Cancel** to *not* change the input and output BNCs and return to the **System Resets Menu**.

This completes the procedure for setting all inputs and output BNCs to the system video format.

Restarting the Global-Store

The **System Resets Menu** includes the Restarting Global-Store function. This function resets the Synergy 100MD Global-Store and video processor. Use this procedure if you are experiencing difficulties with the preview overlay, Global-Store, or as directed by Ross Video Technical Support.

Use the following procedure to restart your Global-Store to factory defaults:

1. Navigate to the **System Resets Menu** as follows:

   • Press **MENU** to display the **Main Menu**.

   • Press **7. Options** to display the **Options Menu**.

   • Press **5. System Resets** to display the **System Resets** menu.

```
System Resets

0. All
1. System Shutdown
2. System Restart
3. Inputs/Outputs
4. Restart Global-Store




MENU    100         10      1     SEL
Exit    Previous    Down    Up    Accept
```
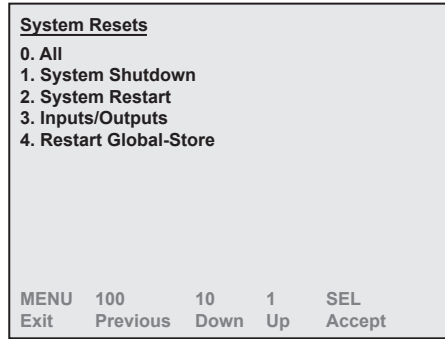
System Resets Menu

2. Press **4. Restart Global-Store** to display the **Restart Global-Store Confirmation Screen**.

3. Press **0. Confirm** to restart the Global-Store.

✓	**Operating Tip**	Press **1. Cancel** to *not* restart the Global-Store to the **System Resets Menu**.

This completes the procedure to restart your Global-Store to factory defaults.

Audio Channel Setup

This section provides information and instructions for assigning audio channels to audio groups and setting the default levels for individual channels. You can control up to **16** audio channels on a single audio mixer board.

✎ **Note** | A remote Audio Mixer must be properly connected to the Synergy 100 MD switcher in order to be able to control audio channel levels. Refer to the section "**Remote Audio Mixer Communication Setup**" on page 9-8 for more information on setting up your remote audio mixer.

Refer to the section "**Assigning Audio Channels**" on page 7-11 for more information on assigning specific audio channels or groups to BNCs.

Setting Up Audio Channel Levels

✎ **Note** | The Synergy 100 MD switcher cannot control multi-fader levels for input channels directly when configured with the Graham-Patten D/ESAM-8000, and will open and close the input channel at one level. Refer to the section "**Setting up a Remote Audio Mixer**" on page 9-18 for more information on working with audio channel levels.

You can set the audio level for each channel controlled by the Synergy 100 MD switcher. This level will be the default level that the audio channel will be brought up to when the BNC input that the audio channel is assigned to is taken on-air.

Use the following procedure to set up audio channel levels:

1. Navigate to the **Inputs Menu** as follows:

   • Press **MENU** to display the **Main Menu**.

   • Press **1. Inputs** to display the **Inputs Menu**.

   ```
   Inputs
   0. Inputs
   1. Panel
   2. Tally
   3. Audio
   4. Reference




   MENU    100          10     1     SEL
   Exit    Previous     Down   Up    Accept
   ```

   Inputs Menu

2. Press **3. Audio** to display the **Audio Menu**.

```
Audio
0. Channel  Chan 1
1. Level      75%
2. Groups




MENU   100         10      1      SEL
Exit   Previous    Down   Up     Accept
```
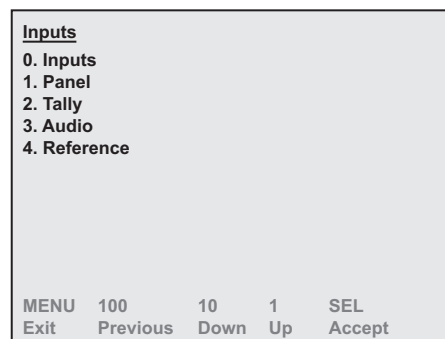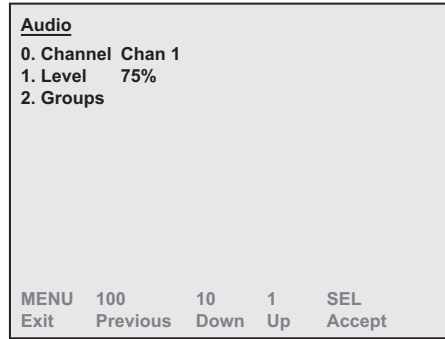
Audio Menu

3. Set the audio level for each channel as follows:

Note | The Audio Level is the level that the audio mixer will take to selected audio channel up to when the associated BNC is taken on-air on the switcher.

- Press **0. Channel**.
- Use the ⬇ and ⬆ buttons to select the channel on the remote audio mixer that you want to set the level for.
- Press **1. Level**.
- Use the ⬇ and ⬆ buttons to select the audio level that you want to audio mixer to take the selected channel to when the associated BNC is taken on-air by the switcher.
- Press the right **SEL** button to accept the new settings.

4. Press **MENU** to display the **Installation Change Screen**.

```
WARNING!



You are about to change the switcher's
installation settings.
0. Confirm              1. Cancel






                        10      1      SEL
                        Down   Up     Accept
```
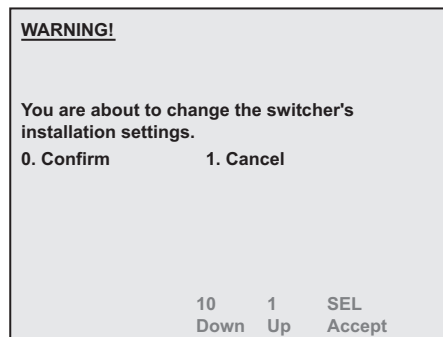
Installation Change Screen

5. Accept or cancel these changes as follows:

- Press **0. Confirm** to accept the changes.
- Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for setting audio channel levels.

Setting Up Audio Channel Groups

Audio groups allow you to tie **3** audio channels together into a single group than can be assigned to a BNC input. This can be used to tie stereo pairs together, or to allow a number of audio channels to be assigned to a BNC input. You can create up to **6** audio groups, each containing up to **3** audio channels.

Use the following procedure to set up audio channel groups:

1. Navigate to the **Inputs Menu** as follows:

    •   Press **MENU** to display the **Main Menu**.

    •   Press **1. Inputs** to display the **Inputs Menu**.

```
Inputs

0. Inputs
1. Panel
2. Tally
3. Audio
4. Reference




MENU    100       10     1      SEL
Exit    Previous  Down   Up     Accept
```

Inputs Menu

2. Press **3. Audio** to display the **Audio Menu**.

```
Audio

0. Channel  Chan 1
1. Level    75%
2. Groups




MENU    100       10     1      SEL
Exit    Previous  Down   Up     Accept
```
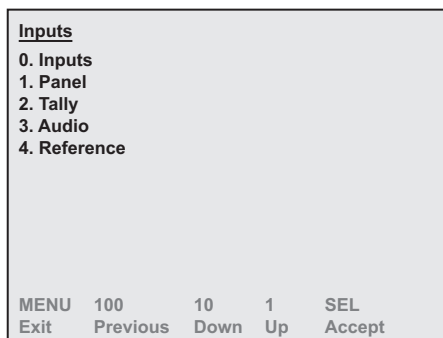
Audio Menu

3. Press **2. Groups** to display the **Groups Menu**.

```
Groups

0. Group       Group 1
1. Channel 1   NONE
2. Channel 2   Chan 15
3. Channel 3   Chan 9




MENU    100       10     1      SEL
Exit    Previous  Down   Up     Accept
```

Groups Menu

4. Select the group you want to add audio channels to as follows:

- Press **0. Group**.
- Use the ⬇ and ⬆ buttons to select the audio group you want to add audio channels to.
- Press the right **SEL** button to accept the new settings.

5. Assign audio channel to the selected group as follows:

✎ **Note** | You can add up to three audio channels to a group, but it does not matter which Channel slots you add them to.

- Press **1. Channel 1**.
- Use the ⬇ and ⬆ buttons to select the audio channel you want to add to the selected group.
- Repeat this procedure for **Channel 2** and **Channel 3** to add a second and third audio channel to the group.
- Press the right **SEL** button to accept the new settings.

6. Press **MENU** to display the **Installation Change Screen**.

<div style="border:1px solid black; padding:10px; width:300px;">

WARNING!

You are about to change the switcher's installation settings.

0. Confirm   **1. Cancel**

	10	**1**	**SEL**
	Down	Up	Accept

</div>
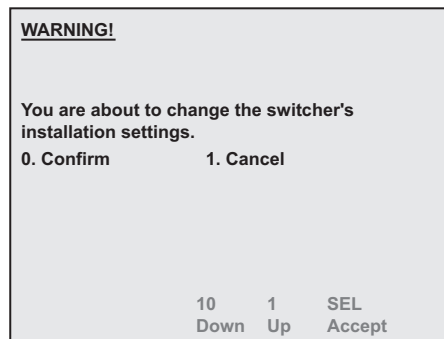
Installation Change Screen

7. Accept or cancel these changes as follows:

- Press **0. Confirm** to accept the changes.
- Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedure for setting up audio channel groups.

Calibration and Diagnostics

In This Chapter

This chapter provides information on switcher calibration and the Synergy 100 MD diagnostic tools. The following topics are discussed:

- Switcher Calibration
- Control Panel Diagnostic Mode
- Communication Port Monitoring

Switcher Calibration

The **Calibration Mode** allows you to calibrate all analog controls on the switcher panel, including the fader, the positioner and all knobs. In addition, you are able to set the brightness levels of all panel button LEDs.

> ⚠ **Notice** — Use this mode with caution. Perform the calibration only when you suspect that there has been "drift" in the knobs or the joystick or that there is a "limit" problem with a fader.

Use the following procedure to calibrate the switcher's controls and adjust the brightness of the LEDs:

1. Enter calibration mode by holding down the following three buttons at once:

   - **ROTATE**
   - **SEL** in the **Mattes Group**
   - **SEL** in the **System Control Group**
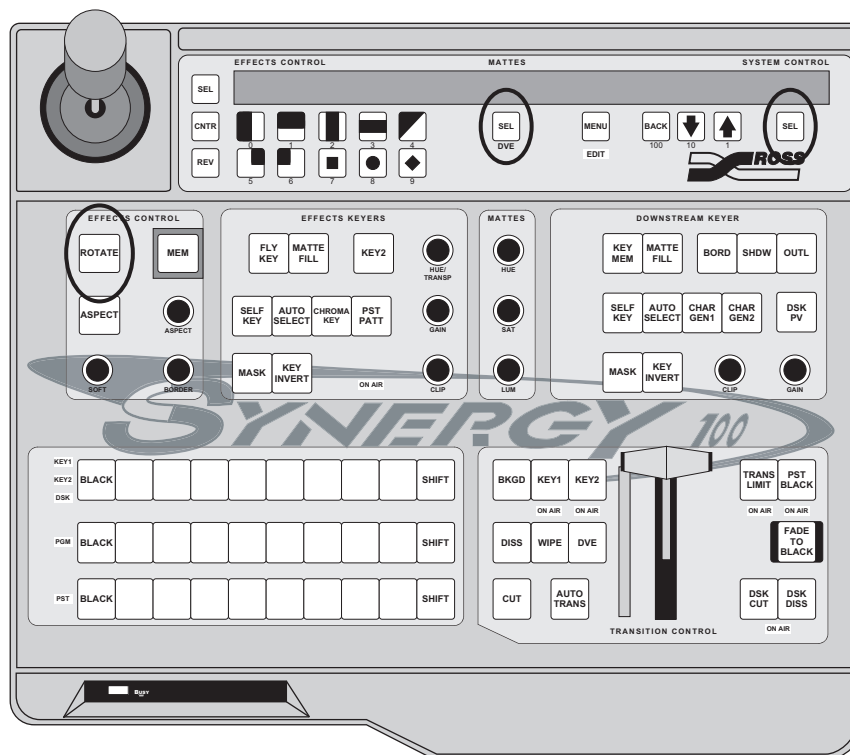
Panel Calibration Mode Buttons

2. The **Panel Calibration Mode Menu** is displayed on the **Preview** monitor:

Panel Calibration Mode

0. Knob/Fader/Positioner Calibration
1. Overall LED Brightness Control
2. Logo Brightness
3. Red Button LED Brightness
4. Orange Button LED Brightness
5. Green Button LED Brightness
6. Red Non-Button LED Brightness
7. Orange Non-Button LED Brightness
8. Green Non-Button LED Brightness

Press any button on lower panel to exit.
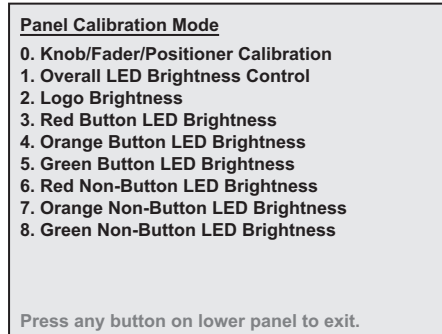
Panel Calibration Mode Menu

Important

> If you select menu item **0. Knob/Fader/Positioner Calibration**, you must calibrate *all analog controls* on your switcher. Failure to do so will map a false limit into switcher memory (for the control(s) that you did not calibrate), thus preventing proper switcher operations.

3. Press **0. Knob/Fader/Positioner Calibration**.

4. Calibrate the knobs on the control panel as follows:

   • Rotate each knob fully left and fully right.

   • Repeat this procedure two or three times for each knob.

   • As you rotate the knobs, you will see a series of numbers appear in the four-character displays in the **Effects Control Group** and **System Control Group**.

Operating Tip

> Calibration is complete when the limit values in these four-character displays no longer change. The numbers for each knob may not match, this is normal.

5. Calibrate the fader on the control panel as follows:

   • Move the fader to the upper limit.

   • Move the fader to the lower limit.

   • Repeat this procedure two or three times.

   • As you move the fader, you will see a series of numbers appear in the four-character displays in the **Effects Control Group** and **System Control Group**.

Operating Tip

> Calibration is complete when the limit values in these four-character displays no longer change.

6. Calibrate the positioner on the control panel as follows:

   • Move the positioner fully left and fully right to calibrate the X-Axis.

   • Move the positioner fully up and fully down to calibrate the Y-Axis.

   • Twist the positioner knob fully clockwise and fully counter-clockwise to calibrate the Z-Axis.

   • Repeat this procedure two or three times.

- As you move the positioner, you will see a series of numbers appear in the four-character displays in the **Effects Control Group** and **System Control Group**.

✓ **Operating Tip**
> Calibration is complete when the limit values in these four-character displays no longer change. The numbers for each axis may not match, this is normal.

7. Adjust the brightness of *all* the lights on the control panel as follows:

✎ **Note**
> The **Overall LED Brightness** sets the range that the individual LEDs can be set to. For example, if you set the overall brightness to 50%, setting the red button brightness to 100% will only be 50% of the maximum possible brightness.

- Press **1. Overall LED Brightness Control**.
- Use the **HUE** knob to adjust the brightness of all LEDs, including button and non-button LEDs, on the control panel. The brightness can be adjusted from **10%** to **100%** and is shown on the display in the **System Control Group**.

✓ **Operating Tip**
> You can use any knob on the control panel to adjust the brightness of the all lights and LEDs. The **HUE** knob is given only as an example.

8. Adjust the brightness of the LEDs behind the Ross logo as follows:

- Press **2. Logo Brightness**.
- Use the **HUE** knob to adjust the brightness of the LEDs behind the Ross logo. The brightness can be adjusted from **10%** to **100%** and is shown on the display in the **System Control Group**.

9. Adjust the brightness of *only* the LEDs behind the buttons as follows:

- Press **3. Red Button LED Brightness**.
- Use the **HUE** knob to adjust the brightness of the red LEDs behind the buttons on the PGM bus. All red, button, LEDs will be set to this brightness. The brightness can be adjusted from **10%** to **100%** and is shown on the display in the **System Control Group**.
- Press **4. Orange Button LED Brightness**.
- Use the **HUE** knob to adjust the brightness of the orange LEDs behind the buttons on the PGM bus. All orange, button, LEDs will be set to this brightness. The brightness can be adjusted from **10%** to **100%** and is shown on the display in the **System Control Group**.
- Press **5. Green Button LED Brightness**.
- Use the **HUE** knob to adjust the brightness of the green LEDs behind the buttons in the **Transition Control Group**. All green, button, LEDs will be set to this brightness. The brightness can be adjusted from **10%** to **100%** and is shown on the display in the **System Control Group**.

10. Adjust the brightness of *only* the LEDs that are not behind a button as follows:

- Press **6. Red Non-Button LED Brightness**.
- Use the **HUE** knob to adjust the brightness of the red LEDs behind the **ON AIR** indicators. All red, non-button, LEDs will be set to this brightness. The brightness

can be adjusted from **10%** to **100%** and is shown on the display in the **System Control Group**.

- Press **7. Orange Non-Button LED Brightness**.

- Use the **HUE** knob to adjust the brightness of the orange LEDs behind the bus indicators. All orange, non-button, LEDs will be set to this brightness. The brightness can be adjusted from **10%** to **100%** and is shown on the display in the **System Control Group**.

- Press **8. Green Non-Button LED Brightness**.

- Use the **HUE** knob to adjust the brightness of the green LEDs behind the bus indicators. All green, non-button, LEDs will be set to this brightness. The brightness can be adjusted from **10%** to **100%** and is shown on the display in the **System Control Group**.

11. Exit calibration mode as follows:

- Press *any* button on the lower portion of the control panel. In the displays across the top of the panel, you will receive a message asking you if you want to save the calibration.

    ~ **No** — Press the right **SEL** button to return the switcher to normal operating mode without accepting the newly calibrated controls.

    ~ **Yes** — Press the center **SEL** button to save the calibration and return the switcher to normal operating mode.

Note | If a message appears on the display stating that the new settings have failed to save properly, press the right or center **SEL** button to confirm the warning. You will have to perform the calibration procedure again and re-save your settings.

This completes our discussion on Calibration Mode.

Control Panel Diagnostic Mode

The panel diagnostic mode allows you to perform a number of tests that include the communications between the control panel and the frame, LED functionality, and inputs from the buttons, knobs, fader and positioner.

To test an individual component of the control panel, you must put the control panel into diagnostic mode, and then operate the component you want to test. As soon as you adjust a button, knob or any other input component on the control panel, testing for that component begins. The result of the test are either shown graphically on the multi segment zinger next to the fader, or numerically in the **Mattes** area of the display.

	Note	The numerical values reported for each component are used to show the full range of adjustment of the component and may vary with each test or component. Contact Ross Video Technical support for more information on these tests.

Use the following procedure to perform a diagnostic of the control panel:

1. Press and hold down the following three buttons at once:

   - **SEL** in the **Effects Control Group**
   - **SEL** in the **Mattes Group**
   - **SEL** in the **System Control Group**
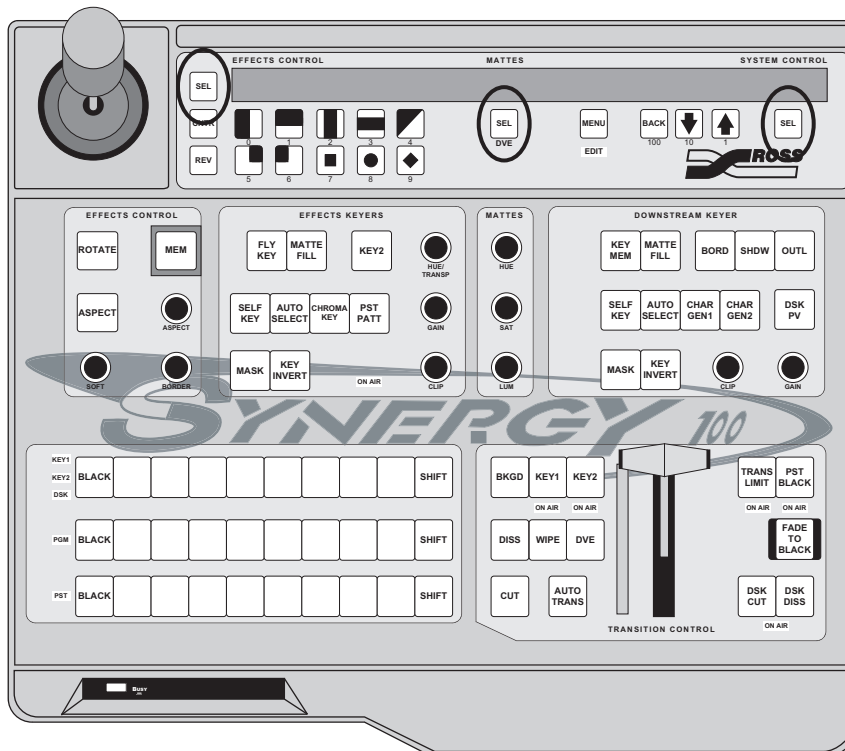
Panel Diagnostic Mode Buttons

In diagnostic mode the display in the **Effects Control Group** will identify the current test that is being performed.

- Feedback on the current test that is being performed, the values that are being returned, whether the test passed or failed and the physical input that was used, is shown in the control panel display.
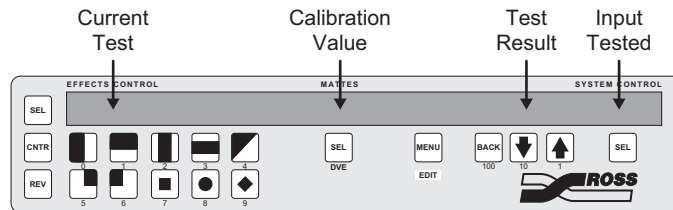
Panel Diagnostic — Feedback

- The following information is shown in the control panel display:

  ~ **Current Test** — The value displayed here indicates the current test that is being performed.

  ~ **Calibration Value** — The value displayed here is the value that the button, knob, positioner, or fader is returning as you move or press it. All these values, except buttons, are also shown graphically on the Zinger next to the fader.

  ~ **Loop-Back Test Result** — The value displayed here will flash between **LooP** and either **PASS** or **FAIL**. This indicates that the Loop test from the control panel to the frame has either passed or failed.

Note | If the control panel is not connected to the frame, or the frame is not powered on, this value will always flash **FAIL**. If a frame is not available, a Loop-Back connector can be used.

  ~ **Input Tested** — The value displayed here is the actual fader, button number, knob name, or positioner axis that is being tested.

2. Test the **Knobs** on the control panel as follows:

Note | The name of the knob being tested will be shown in the **System Control** area of the display.

- Rotate the knob you want to test fully counter-clockwise. The zinger next to the fader will decrease until none of the segments are lit.

- Rotate the knob you want to test fully clockwise. The zinger next to the fader will increase until all of the segments are lit.

3. Test the **Fader** on the control panel as follows:

- Move the fader to the upper stop. The zinger next to the fader will increase until all of the segments are lit.

- Move the fader to the lower stop. The zinger next to the fader will decrease until none of the segments are lit.

4. Test the **Positioner** on the control panel as follows:

Note | When testing the positioner, it is important to move the positioner in only the axis you are currently testing.

- Test the **X-Axis** as follows:

    ~ Move the positioner all the way to the left to test the X-Axis. The zinger will increase until all of the segments are lit.

    ~ Move the positioner back the center position. The zinger will decrease until half of the segments are lit.

    ~ Move the positioner all the way to the right to test the X-Axis. The zinger will decrease until none of the segments are lit.

- Test the **Y-Axis** as follows:

    ~ Move the positioner all the way to the bottom to test the Y-Axis. The zinger will increase until all of the segments are lit.

    ~ Move the positioner back the center position. The zinger will decrease until half of the segments are lit.

    ~ Move the positioner all the way to the top to test the Y-Axis. The zinger will decrease until none of the segments are lit.

- Test the **Z-Axis** as follows:

    ~ Rotate the knob on the positioner all the way to counter-clockwise to test the Z-Axis. The zinger will increase until all of the segments are lit.

    ~ Rotate the knob on the positioner back the center position. The zinger will decrease until half of the segments are lit.

    ~ Rotate the knob on the positioner all the way to clockwise to test the Z-Axis. The zinger will decrease until none of the segments are lit.

5. Test the **Buttons** and **LEDs** on the control panel as follows:

    - Press and hold down the button you want to test. The number of the button will be shown in the **System Control** area of the display, and the word **down** should be shown in the **Mattes** area of the display.

    - Release the button and the word **up** should be shown in the **Mattes** area of the display.

    - Each time you press the button, the LEDs in that **group**, or on that crosspoint **bus**, will cycle to the next color LED. Typically, this is the green LEDs, followed by the red LEDs, and then the orange LEDs. If the group does not contain all colors of LEDs, only the available colors will be cycled through.

6. Press and hold down the following three buttons at once to exit panel diagnostic mode:

    - **SEL** in the **Effects Control Group**
    - **SEL** in the **Mattes Group**
    - **SEL** in the **System Control Group**

This completes the procedure for performing a diagnostic of the control panel. If you are unsure about the results of the test, or think that the results are incorrect, contact Ross Video Technical Support.

Communication Port Monitoring

The **Communication Port Monitoring** function enables you to set up monitoring capabilities for the data transmitted and received through your communication ports. This function is provided as a troubleshooting tool to assist Ross Video Technical Support.

Configuring the Communication Port Monitoring

Use the following procedure to configure the Communication Port Monitoring:

1. Navigate to the **Communication Menu** as follows:

   • Press **MENU** to display the **Main Menu**.

   • Press **4. Communication** to display the **Communication Menu**.

```
Communication

0. Port    Periph1    5. Protocol   RS232
1. Type    Editor     6. Input      None
2. Device  GVG4000    7. Monitor
3. Baud    38400      8. Option     None
4. Parity  Odd        9. Reserved




MENU   100            10     1      SEL
Exit   Previous       Down   Up     Accept
```
Communication Menu

> **Note** Regardless of the communications parameters you are configuring, for example editor, audio mixer, or tally system interface equipment, **7** will always be **Monitor**.

2. Press **7. Monitor** to display the **Monitor Menu**.

```
Monitor

0. Port       Panel  5. Save
1. Format     Hex    6. Clear
2. Tx/Rx      Rx     7. Address   000
3. Freeze     No
4. Streaming  No




MENU   100           10     1      SEL
Exit   Previous      Down   Up     Accept
```
Communication – Monitor Menu

3. Select a port to monitor as follows:

   • Press **0. Port**.

   • Use the ⬇ and ⬆ buttons to select the communication port you want to monitor.

   • Press the right **SEL** button to accept the new settings.

4. Select a format to display the monitoring information as follows:

    • Press **1. Format**.

    • Use the ⬇ and ⬆ buttons to select a format to display the monitoring information from the selected communications port. You can choose between the following:

       ∼ **Hex** — Use this option to display the raw data in Hexadecimal format.

       ∼ **ASCII** — Use this option to display the raw data in American Standard Code for Information Interchange format (printed characters).

    • Press the right **SEL** button to accept the new settings.

5. Select the type of monitoring as follows:

    • Press **2. Tx/Rx**.

    • Use the ⬇ and ⬆ buttons to select the traffic flow to monitor on the selected communications port. You can choose between the following:

       ∼ **Tx** — Use this option to monitor the Transmit data from the selected port.

       ∼ **Rx** — Use this option to monitor the Receive data from the selected port.

    • Press the right **SEL** button to accept the new settings.

6. Send or receive data as follows:

    • Press **3. Freeze**.

    • Use the ⬇ and ⬆ buttons to select whether to receive data or not. You can choose between the following:

       ∼ **Yes** — Use this option to stop receiving data. The current data is frozen and new traffic data is not recorded.

       ∼ **No** — Use this option to begin sending or receiving data. The old traffic data is continuously cycled out to allow space for the newest traffic data.

✎ **Note** | Streaming (see below) is not available if **Freeze** is set to **Yes**. |

    • Press the right **SEL** button to accept the new settings.

7. Enable the streaming of data to a file on the hard drive as follows:

    • Press **4. Streaming**.

    • Use the ⬇ and ⬆ buttons to select whether to stream data or not. You can choose between the following:

       ∼ **Yes** — Use this option to start the streaming of data. The data is added to the file until you toggle this option to **No** or one hour elapses. The data file may be retrieved from the switcher via the Synergy MD/X Web Interface. Refer to the section, "**Working with Port Monitor Files**" on page 6-27 for more information.

       ∼ **No** — Use this option to stop the streaming of data to the file.

    • Press the right **SEL** button to accept the new settings.

✎ **Note** | You can not stream data from the panel frame port or any port set to a communication rate of 115 kb/s or greater. |

---

8. Press **5. Save** to save currently collected data that has not been streamed. The data is stored to a file on the switcher hard drive and may be retrieved via the Synergy MD/X Web Interface. Refer to the section, "**Working with Port Monitor Files**" on page 6-27 for more information.

9. Clear all recorded data from the buffer as follows:

    •   Press **6. Clear**.

    •   Press the right **SEL** button to accept the new settings.

10. Select a buffer location that is beyond the visible display parameters as follows:

    •   Press **7. Address**.

    •   Use the ⬇ and ⬆ buttons to select the buffer location.

    •   Press the right **SEL** button to accept the new settings.

11. Press **MENU** to display the **Installation Change Screen**.

12. Accept or cancel these changes as follows:

    •   Press **0. Confirm** to accept the changes.

    •   Press **1. Cancel** to exit the menus safely, without making any changes. The system returns to the previously stored settings.

This completes the procedures for setup of the **Communication Port Monitoring** function. If you require further information on the various options and their associated values, contact **Ross Video Technical Support** at the number listed in the front of this manual.

Power Supplies and Fans

In This Chapter

The following topics are discussed in this chapter:

- A Note About Redundant Power
- Replacing a Control Panel Power Supply
- Frame Power Supply
- Power Supply Functional Components
- Diagnosing a Power Supply
- Replacing a Power Supply
- Cooling Fans
- Fan Carrier Functional Components
- Cleaning the Air Filter

A Note About Redundant Power

The **Redundant Power Supply** option provides protection against power supply failure for the frame. With the option installed, complete failure of one power supply will not affect switcher operation.

The procedures for replacing power supplies outlined in this chapter can also be applied to the installation of the **Redundant Power Supply** option. For more information on upgrading your Synergy MD system with redundant power, please contact Ross Video Technical Support.

Replacing a Control Panel Power Supply

This section provides detailed instructions for replacing a failed Synergy 100 MD control panel external power supply. A power supply failure will be indicated by the absence of illuminated LEDs on the control panel.

	Note	You will need the **Redundant Power** (Control Panel Only) option in order to replace a failed power supply.

If you suspect that the power supply has failed, use the following procedure to change a control panel power supply.

	Warning	Hazardous voltages are present inside the external power supply of the control panel. To avoid electrical shock, disconnect the A/C line cord from the external power supply before servicing.

1. Unplug the AC power cord of the external power supply from the AC outlet.

2. Disconnect the power supply from the DC connector on the back of the Synergy 100 MD control panel and set it aside. Use the figure below for reference.
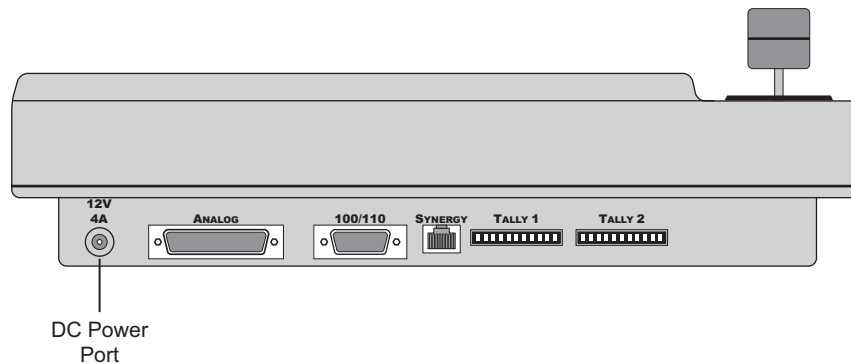
DC Power Port — Synergy 100 MD Control Panel Rear

3. Unpack the new power supply, and plug it into the DC connector on the back of the Synergy 100 MD control panel.

4. Pack the old external power supply into the shipping container of the new power supply, and return it to Ross Video Technical Support.

5. Re-connect the AC power cord of the external power supply to the AC outlet.

This completes the procedure for replacing the Synergy 100 MD control panel power supply.

Frame Power Supply

The Synergy 100 MD frame comes standard with one 12 Volt, 500 Watt power supply. In addition, if desired, an additional power supply can be added by purchasing the Redundant Power (Frame Only) option. This upgrade allows the power supplies to operate in a load sharing mode, where, if one power supply fails, the remaining power supply is able to provide sufficient power to the system. This redundancy allows the hot-swapping of a power supply without interruption of the system.

This section provides an overview of the power supply located in the Synergy MD frame, and includes details of the functional components, as well as the procedures required to diagnose and replace a failed power supply.

⚠	**Notice**	Proper system ventilation requires the frame door to be closed. As removing the door while the system is operational can create excessive heat conditions, hot swapping a power supply should be done in a timely manner to reduce the risk of system over-heating.

Power Supply Functional Components

There are six key components located inside the power supply. These components include the power switch, status indicators, and the midplane connections.

⚡	**Warning**	Hazardous voltages will be present within the power supply module for a short period of time after removal from the system frame. The power supply cover is intended to protect the user from access to these areas, and should not be removed. Ross Video power supplies are intended to be factory serviced by qualified Ross Video service personnel only. Service or any component replacement other than the AC input fuse is not advised.
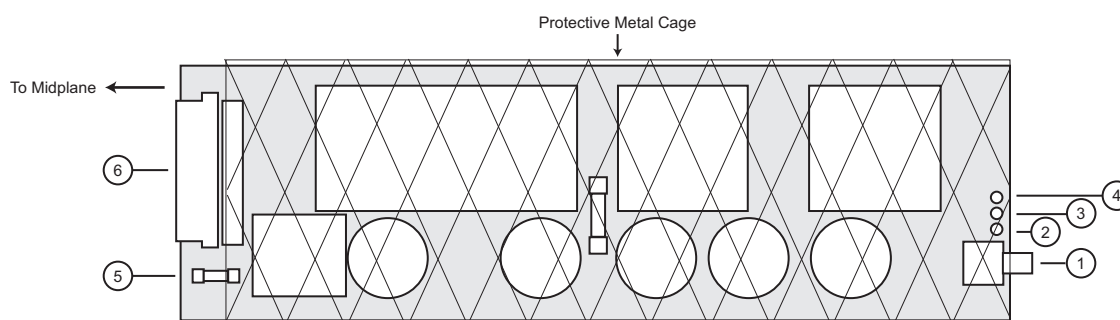
Power Supply — Functional Components

1) Power Switch	3) Yellow Standby Indicator	5) AC Input Fuse
2) Green Power Indicator	4) Red Fail Indicator	6) Midplane Connector

1. Power Switch

The power switch is used to turn the individual power supplies on and off. The switch is in the off position when it is toggled down.

2. Green Power Indicator

This green indicator illuminates to show that the power supply is functioning properly.

---

3. **Yellow Standby Indicator**

   This yellow indicator illuminates to show that the power supply is in standby mode. This occurs when the power switch on the power supply has been turned off.

4. **Red Fail Indicator**

   This red indicator illuminates to show that the power supply is not operating. This occurs when the power supply has failed or is installed incorrectly.

5. **AC Input Fuse**

   This 250 VAC, 10 AMP fuse is accessible from the back of the power supply and can be replaced without removing the protective metal cage. If the fuse does need to be replaced, use a 5x20 mm, time lag (slow blow) fuse that meets CSA, UL, and IEC standards.

6. **Midplane Connector**

   The power supply has a single connector that is used to pass power and command signals between the midplane, the power supply, and the AC power inlets on the back of the frame.

Diagnosing a Power Supply

When a power supply fails, or is in stand-by, the text "**Frme Comm Lost**" will be displayed in the four-character displays on the Synergy 100 MD control panel. When this happens, you will need to diagnose the problem to determine if the power supply needs to be replaced.
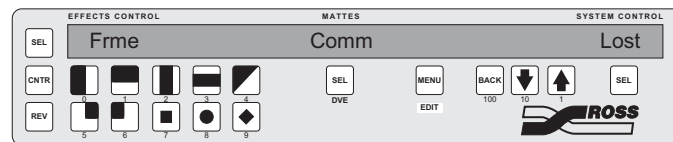
Synergy 100 MD Control Panel — Frame Power Failure Indicators

The "**Frme Comm Lost**" text on the control panel and the indicators and switch on the power supply can help you diagnose the status of the power supply and what actions to take to correct the problem.

Power Supply Troubleshooting

Power Switch	Green Power Indicator	Yellow Standby Indicator	Red Fail Indicator	Status
ON	ON	OFF	OFF	**Normal Operation** • Check the RJ-45 cable connecting the control panel to the frame
OFF	OFF	ON	OFF	**Power supply is in stand-by mode** • Toggle the power switch to **ON** for normal operation
ON	OFF	OFF	ON	**Fail Mode** 1 Check AC cable and building circuit breakers 2 Replace power supply if needed
ON	OFF	OFF	OFF	**Fail Mode** 1 Check AC cable and building circuit breakers 2 Check AC input fuse and replace if needed 3 Replace power supply if needed

Power Switch	Green Power Indicator	Yellow Standby Indicator	Red Fail Indicator	Status
OFF	OFF	OFF	OFF	**Fail Mode** 1 Check AC cable and building circuit breakers 2 Check AC input fuse and replace if needed 3 Replace power supply if needed

Use the table above to help you identify the problem with the power supply. After taking corrective action, confirm that the failure has been corrected by checking for the **"Frme Comm Lost"** text on the control panel. If the failure has not been corrected, consult the table again. If needed, replace the power supply according to the procedures provided in "**Replacing a Power Supply**" section below.

✎	**Note**	For further assistance, contact Ross Video Technical Support.

Replacing a Power Supply

When a power supply needs to be removed, the power supply itself must be powered down. If you do not have the Redundant Power option installed, this will result in the Synergy 100 MD system being offline. Refer to the section "**Diagnosing a Power Supply**" on page 13-4 for information on when to replace a power supply.

✎	**Note**	If the **Redundant Power** option is installed in the frame, the power switch on the redundant power supply *should not* be toggled off. With this option installed, the frame can remain in operation while a power supply is removed and replaced.

⚠	**Caution**	Hazardous voltages are present on the pins of supply mating connectors within the frame power supply housing area. To reduce the risk of electric shock, keep clear of mating connectors within the supply area when power supplies modules are not installed.

To Replace a Power Supply

Use the following procedure to replace a frame power supply:

1. Remove the front cover of the frame.

2. Locate the power supply you wish to replace.
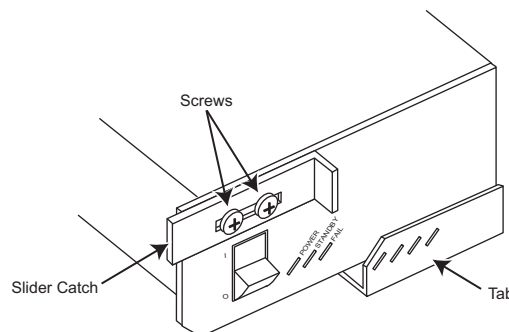
Power Supply — Protective Cage

---

3. Switch the power supply **OFF** by toggling the power switch down.

4. Loosen the two screws holding the slider catch in place until the catch moves freely.

5. Move the slider catch all the way to the right.

Caution   The metal cage surrounding the power supply may be hot after prolonged system operation.

6. Grasp the tab and gently pull the power supply out of the frame.

7. Switch the replacement power supply **OFF** by toggling the power switch down.

8. Install the new power supply by sliding it into the open slot and pushing it firmly into place.

9. Move the slider catch to the left until it hooks the side of the slot.

10. Tighten the screws to secure the slider catch in place.

11. Switch the new power supply **ON** by toggling the power switch up.

12. Replace the front cover of the frame.

    The control panel will automatically detect the new power supply and the "**Frame Comm Lost"** text on the control panel will disappear.

This completes the procedure for replacing a frame power supply.

Cooling Fans

The Synergy MD frame has a **Fan Carrier** (4400A-012) which is actually an assembly of two cards, the **Fan Controller Board** (4400A-011) and the **Fan Display Board** (4400A-016). This assembly supports four 60mm and three 120mm cooling fans.

In addition to the Fan Carrier, there is an air filter that prevents dust and airborne contaminants from getting inside the frame. There is also a **Fan Interface Card** (4400A-013 or 4400AR-017) that provides the connection between the Fan Carrier and the midplane. The Fan Interface Board is permanently installed in the switcher frame.

This section provides a description of the Fan Carrier Assembly that is located in the Synergy 100 MD frame. This overview includes the functional components of the Fan Carrier, as well as the procedures required to remove and clean the air filter.

⚠	**Notice**	Proper system ventilation requires the frame door to be closed. As removing the door while the system is operational can create excessive heat conditions, any online servicing should be done in a timely manner to reduce the risk of system over-heating.

Fan Carrier Functional Components

There are six key components on the Fan Carrier that provide communication and control for the card and the fans.
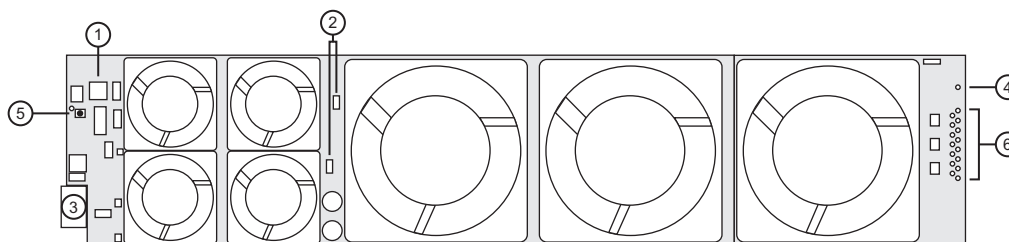
Fan Carrier — Functional Components

1) On-Board Controller	3) Fan Interface Card Connector	5) Reset Button
2) Fan Controllers	4) Fan Fail Indicators	

1. On-Board Micro Controller

The on-board micro controller governs the on-board communication and control, as well as the communication with the midplane through the Fan Interface Board.

2. Fan Controllers

These controllers regulate the speed and operation of the fans as requested by the system for cooling of the frame. The controllers also monitor the fans for failures.

3. Fan Interface Card Connector

The Interface Card Connector plugs into the Fan Interface board that is located at the back of the frame. The Fan Interface board then routes power and interface signals from the midplane to the Fan Carrier. Refer to the following diagram.
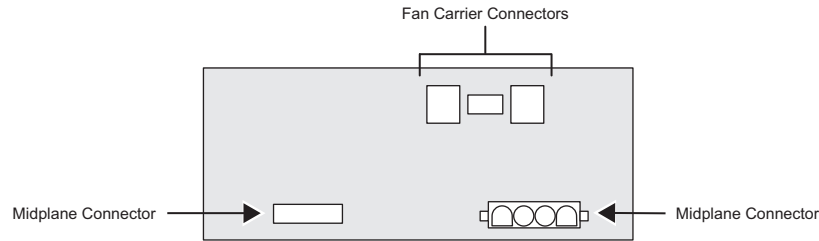
Fan Interface Card (4400AR-017) — Overview

4. **Fan Fail Indicators**

   These 16 indicators (8 red and 8 green) display the status of the fans through the front cover of the frame. One pair, consisting of one red and one green LED, is associated with each fan. If all fans are functioning correctly, all of the green LEDs will be illuminated. A solid red LED indicates a fan failure.

   For a few seconds on system power up, the indicators will flash red. As groups of fans begin functioning, the red LEDs will turn off, and green LEDs will illuminate. On system shutdown (from the menu), the LEDs will flash alternately between all on and their state prior to shutdown. This acts as an indication that the switcher chassis has been shut down from the control panel.

5. **Reset Button**

   The Reset button provides a local, hard reset of the Fan Carrier, and should only be used for diagnostic purposes.

Cleaning the Air Filter

The Synergy MD frame has a single air filter that is used to prevent dust and airborne particulates from contaminating the frame. This filter should be cleaned at least once a year; but may need to be cleaned more frequently in some environments.

To Clean the Air Filter

Use the following procedure to clean the air filter of the Synergy MD frame:

1. Remove the front cover of the frame.
2. Locate the air filter on the far left side of the frame, next to the Fan Carrier assembly.
3. Grasp the end of the filter and gently pull it out of the frame.
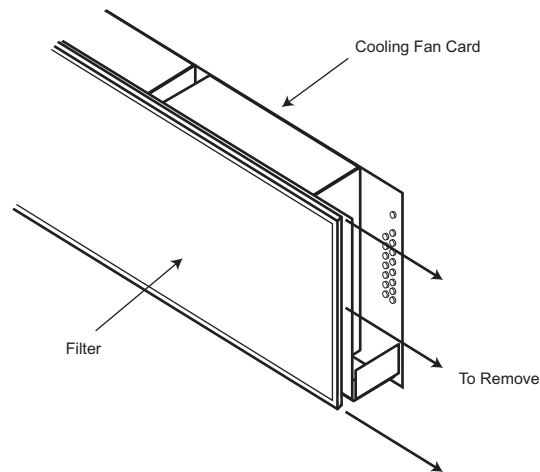
Fan Carrier and Filter — Overview

4. While servicing the air filter, replace the front cover of the frame.

5. Brush any loose dust off of the filter.

6. Place the filter under warm running water to remove any remaining dust.

Note On one side of the filter is a "bug screen" mesh. When rinsing, water should flow *out* of this side.

7. Remove the filter from the water and pat dry with a towel to remove any moisture.

8. Remove the front cover of the frame.

9. Replace the clean, dry filter back into the air filter slot in the frame. Ensure that the side with the mesh is facing the outer wall of the frame, and the edge *without* the foam is situated at the front of the chassis.

10. Replace the front cover of the frame.

   With the air filter cleaned, it is a good idea to record how dirty it was and how long it has been since the last cleaning. If the filter was very dirty, you should shorten the interval between cleanings to compensate for your particular conditions.

This completes the procedure for cleaning the air filter of the Synergy MD frame.

Frame Boards

In This Chapter

This chapter provides an overview of the various system boards that comprise the Synergy 100 MD frame.

The following topics are discussed:

- Frame Board Overview
- Option Cards Overview
- Midplane
- Video Input Board
- Video Output Board
- CPU Board
- Video Processor Board
- Squeeze & Tease Carrier Board
- Squeeze & Tease DSP Card
- Squeeze & Tease MD Card
- Squeeze & Tease MD WARP Card

Frame Board Overview

The following system boards are described in this chapter:

Midplane (4400A-010, 4400AR-019)

The **Midplane** is a non-removable board that provides the interconnects between the system chassis boards, the power supplies, and the fan assembly, as well as the routing through which all video signals, communication, and control commands pass. The board has no active components.

Input Board (4400A-060B, 4400AR-062)

The **Input Board** comes in the following configurations:

- a 48 x 48 crosspoint matrix with an analog reference loop (**4400A-060B**), and

- a 72 x 72 crosspoint matrix with an analog reference loop (**4400AR-062**).

The Synergy 100 MD frame supports one **Video Input Board**, in **Slot C** on the rear of the frame. All versions of the boards have a total of 16 fully configurable multi-definition video inputs and 2 analog reference loop connections.

⚠️ **Important** | The **4400AR-062** input board with 72 x 72 crosspoint is only compatible with the **4400AR-019** midplane. |

Output Board (4800A-064)

The Synergy 100 MD frame supports one **Video Output Board**, in **Slot B** on the rear of the frame. This board contains 16 fully configurable multi-definition video outputs that can be used as Aux Buses, MLE Program, MLE Preview, MLE Clean Feed, Preview Overlay, External DVE Send, or MultiDSK.

Frame CPU Board (4800A-001)

The Frame **CPU Board** resides in **Slot A** at the rear of the frame, and is connected to the midplane. It contains the hard disk, the system memory, and the main system microprocessor, and is responsible for the high-level control functions and all Ethernet and remote serial communication for the frame, and between the frame and control panel.

Video Processor Board (4800A-040)

The **Video Processor Board** performs all of the basic video effects in the Synergy 100 MD Switcher. Functions such as the interface to the Squeeze & Tease MD boards, Chroma Keying, patterns and wipes, and transitions are all generated on this card.

The Video Processor Board includes two slots to support future hardware options.

Squeeze & Tease Carrier Board (4800A-047)

The **Squeeze & Tease Carrier Board** provides four slots for the Squeeze & Tease MD Cards and two slots for the Squeeze & Tease WARP MD Cards. The board also provides local control as well as video routing and power to these cards.

Note | The Squeeze & Tease WARP MD Card is not yet implemented.

Option Cards Overview

The following option cards are described in this chapter:

Squeeze & Tease DSP Card (4800A-046)

The **Squeeze & Tease DSP Card** provides all the control functions for the **Squeeze & Tease MD Cards** and **Squeeze & Tease WARP MD Cards**. This allows the cards to communicate with the other cards installed on the board, as well as with the rest of the system.

Squeeze & Tease MD Card (4800A-048)

The **Squeeze & Tease MD Card** performs all the Squeeze & Tease video manipulation for the system. This includes planar processing, pre-processing, lighting, 3D borders, and filtering.

Squeeze & Tease MD WARP Card (4800AR-049)

The **Squeeze & Tease MD WARP Card** performs all the 3D WARP effects.

Midplane

The Synergy 100 MD frame has a 3-RU (Rack Unit) Midplane (4400A-010 or 4400AR-019) to which all the frame boards are connected. The midplane also contains the routing through which all video signals pass, as well as all command and control communication, and power to the boards.

This section will identify and describe the various functional components of the front and rear of the Synergy 100 MD midplane.

The Midplane Functional Components

The midplane is a vertically mounted board that provides a series of connectors on both the rear and front to accept corresponding connectors found on each of the frame boards. Each of these slots is designed to accommodate one specific board.
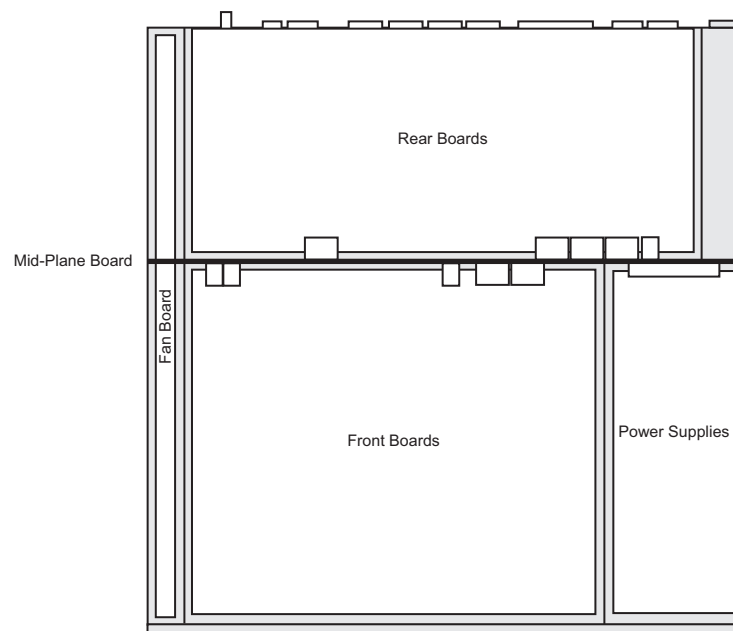
Synergy 100 MD Frame — Overview

Rear Connections

The rear connections on the midplane accommodate the following boards that are installed in the rear section of the switcher chassis:

- CPU Board
- Video Input Board
- Video Output Board
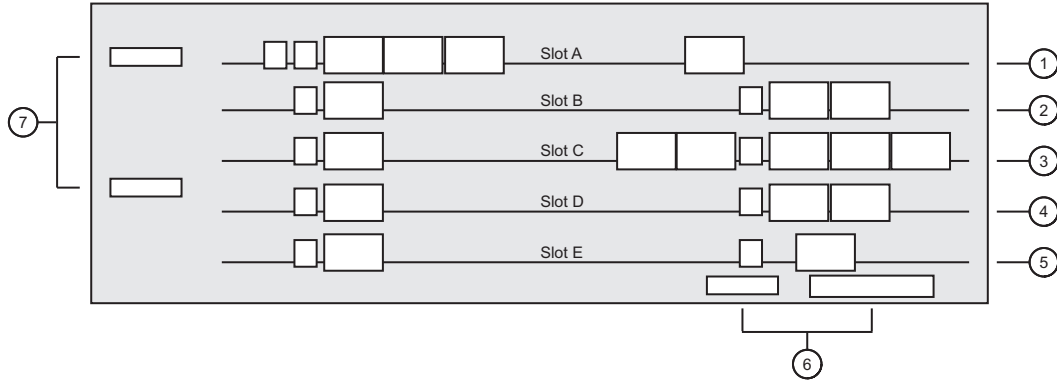
Midplane (4400A-010) Rear View — Functional Components

1) CPU Board Slot	4) Future Expansion Slot	6) Cooling Fan Board Connectors
2) Video Output Board Slot	5) Future Expansion Slot	7) Power Input Connectors
3) Video Input Board Slot		

1. CPU Board Slot

Only the CPU Board can be installed in Slot A.

2. Video Output Board Slot

Only the Video Output Board can be installed in Slot B.

3. Video Input Board Slot

Only a Video Input Board with reference looping (4400A-060B or 4400AR-062) can be installed in Slot C. This board also provides the crosspoint switching for the Synergy 100 MD Switcher.

✳	**Important**	The **4400AR-062** input board with 72 x 72 crosspoint is only compatible with the **4400AR-019** midplane.

4. Future Expansion Slot

Slot D will be used for future expansion.

5. Future Expansion Slot

Slot E will be used for future expansion.

6. Fan Carrier Connectors

These connectors provide the interface for the Cooling Fan Board to the midplane (4400A-010).

✎	**Note**	Removal of the Cooling Fan Board will cause the system to go into an immediate power down mode to protect the system hardware.

7. Power Input Connectors

These connectors take the input power from the AC power filters at the back of the frame and route it to the power supplies at the front of the midplane.

Front Connections

The connections on the front of the midplane accommodate the Video Processor Board, the Squeeze & Tease Carrier Board, and the power supplies. Refer to the following diagram.
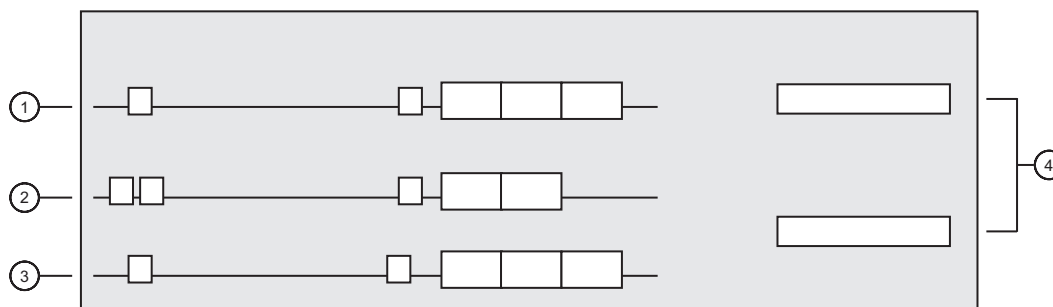
Midplane Front View — Functional Components

1) Video Processor Board Slot	3) Future Expansion Slot
2) Squeeze & Tease Carrier Board Slot	4) Power Supply Connectors

1. Video Processor Board Slot

Only the Video Processor Board can be installed in this slot.

2. Squeeze & Tease Carrier Board Slot

Only the Squeeze & Tease Carrier Board can be installed in this slot.

3. Future Expansion Slot

This slot will be used for future expansion.

4. Power Supply Connectors

The Synergy MD frame supports two 12 Volt, 500 Watt power supplies. These power supplies are operated in a load sharing mode, where any one power supply can provide all the power for the system should the other fail. This redundancy allows the hot-swapping of a power supply without interruption of the system.

Video Input Board

The Video Input Board comes with a 48 x 48 crosspoint switch and reference input (4400A-060B) or with a 72 x 72 crosspoint switch and reference input (4400AR-062). All versions of the board can handle up to 16 Serial Digital Interface (SDI) or High Definition Serial Digital Interface (HD-SDI) video signals plus two additional BNC connectors used for the analog reference signal.

This section will identify and describe the various functional components and rear panel connections of the Video Input Boards both with and without reference looping.

Video Input Board Functional Components

The Video Input Board with reference looping has 8 primary components that control and support the video signal inputs.
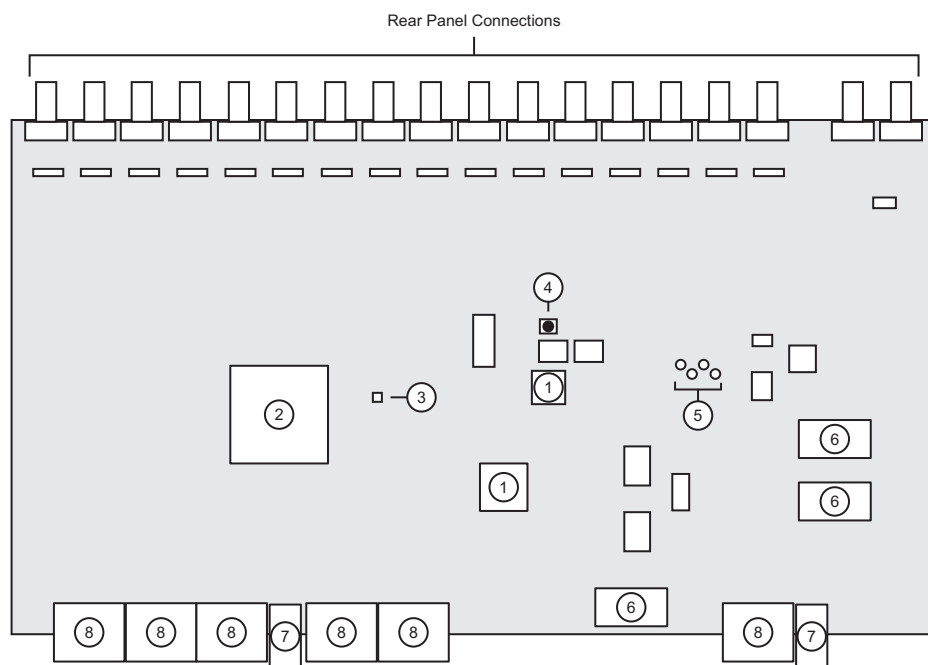
Video Input Board (4400A-060B) with Reference Looping — Functional Components

1) Reference Processors	4) Reset Button	7) Power Connectors
2) Crosspoint Switch	5) Diagnostic Indicators	8) Midplane Connectors
3) Temperature Sensor	6) Power Converters	

1. Reference Processors

The reference processors act together to process the black burst or tri-level sync clock and timing signals from the reference connectors.

2. Crosspoint Switch

The crosspoint switch routes video signals from the input port to the specified output port. Specifically, the 4400A-060B Video Input Board uses a 48 x 48 switch and the 4400AR-062 as a 72 x 72 switch but operates as a 48 x 48 switch.

3. **Temperature Sensor**

   A temperature sensor is used to ensure that the board is not operated beyond a set temperature threshold. This temperature information is used by the frame to regulate the operation of the cooling fans.

4. **Reset Button**

   The reset button provides a hard, local, reset for the Video Input Board, and should only be used for diagnostic purposes.

5. **Diagnostic Indicators**

   The four diagnostic indicators illuminate to show various board states and should only be used for diagnostic purposes.

6. **Power Converters**

   There are three non-isolated power converters that are used to generate the voltages that are needed by the various components on the board.

7. **Power Connectors**

   There are two power connectors that connect to the midplane when the board is installed.

8. **Midplane Connectors**

   There are six 20-pair connectors that connect to the midplane when the board is installed. These connectors use Ethernet and SMPTE protocols to communicate and pass video signals with other boards connected to the midplane.

Video Input Board Rear Panel

The rear panel of the Video Input Board with reference looping has two different types of inputs. These inputs are an array of 16 video input connectors and the reference loop connectors, with a reference lock indicator.
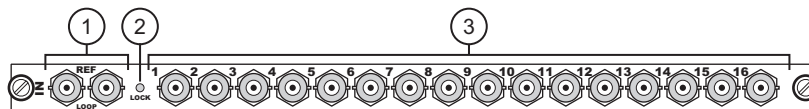
Video Input Board with Reference Looping — Rear Panel

1) Reference Connectors	2) Reference Lock Indicator	3) Video Input Connectors

1. **Reference Connectors**

   The two reference connectors provide a reference input with a looping output. These connectors allow the Video Input Board to extract reference information from either a tri-level sync or analog black burst reference source. The Video Input Board can then use this reference information to drive the timing on the internal buses to provide timing for the system.

Important The reference loop connector must be terminated if it is the last device in the series.

2. **Reference Lock Indicator**

   The reference lock indicator will illuminate when the board has locked to a reference signal.

3. **Video Input Connectors**

   The 16 video input connections on the Video Input Board support both HD-SDI and SDI video signals.

Video Output Board

The Video Output Board (4800A-064) provides 16 SDI or HD-SDI video signal outputs. This section will identify and describe the various functional components and rear panel connections of the Video Output Board.

✎ **Note** | The Synergy 100 MD frame can only support one Video Output Board.

The Video Output Board Functional Components

The Video Output Board has several primary components that control on-board operations and video signal routing from the midplane to the video output connectors.
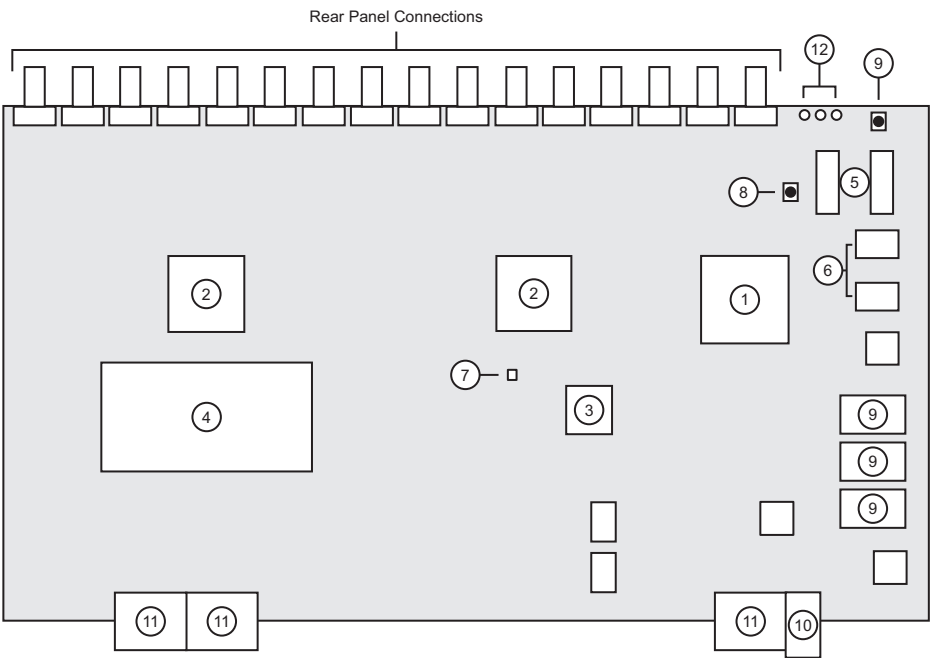
Video Output Board — Functional Components

1) On-Board Processor	5) On-Board System Memory	9) Power Converters
2) Routing FPGA	6) Flash Memory	10) Power Connector
3) Control and Video Features FPGA	7) Temperature Sensor	11) Midplane Connectors
4) Future Expansion Socket	8) Reset Buttons	12) Diagnostic Indicators

1. On-Board Processor

The on-board processor is used for internal ethernet access, and local control of the board.

2. Routing FPGAs

The Video Output Board uses two FPGAs to re-time the video signals, as well as perform MultiDSK™ functions.

3. **Control and Video Features FPGA**

   A single FPGA is used to provide an interface to the Preview Overlay when the MultiDSK™ is used.

4. **Future Expansion Socket**

   This socket is reserved for future expansion.

5. **On-Board System Memory**

   The Video Output Board uses four 256MB SDRAM chips for system memory.

6. **Flash Memory**

   The Video Output Board has 64MB of flash memory for code store, still store images, and FPGA loads.

7. **Temperature Sensor**

   A temperature sensor is used to ensure that the board is not operated beyond a set temperature threshold. This temperature information is used by the frame to regulate the operation of the cooling fans.

8. **Reset Buttons**

   The two reset buttons provide a local, hard reset of the on-board processor and the entire Video Output Board, and should only be used for diagnostic purposes.

9. **Power Converters**

   The frame Video Output Board uses three non-isolated power converters to generate the voltages that are needed by the various components on the board.

10. **Power Connector**

    The Synergy 100 MD Video Output Board has a single power connector that, when the board is installed, connects to the midplane.

11. **Midplane Connectors**

    The Synergy 100 MD Video Output Board has three 20-pair connectors that connect to the midplane when the Video Output Board is installed. These connectors use Ethernet and SMPTE protocols to communicate and pass video signals with other boards connected to the midplane.

12. **Diagnostic Indicators**

    The three diagnostic indicators illuminate to show various board states and should only be used for diagnostic purposes.

The Video Output Board Rear Panel

The rear panel of the Video Output Board has an array of 16 video output connections. Each of these output connections can support either an HD-SDI or SDI video signal, depending on the output signal that is being routed through them.
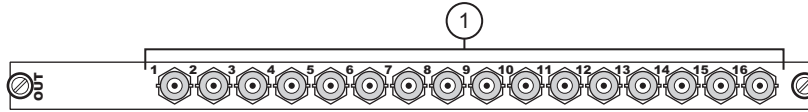
Video Output Board — Rear Panel

1. **Video Output Connectors** – The 16 video output connections on the Video Output
    Board support both HD-SDI and SDI video signals.

CPU Board

Each Synergy 100 MD system has a single CPU Board (4800A-001) that controls the operation of the various boards that are installed in the frame. The CPU Board also controls the communication between the frame and the control panel, peripheral devices, and external networks.

This section will identify and describe the various functional components and rear panel connections found on the CPU Board.

CPU Board Functional Components

The CPU Board has several primary components that control various aspect of the operation of the CPU Board.
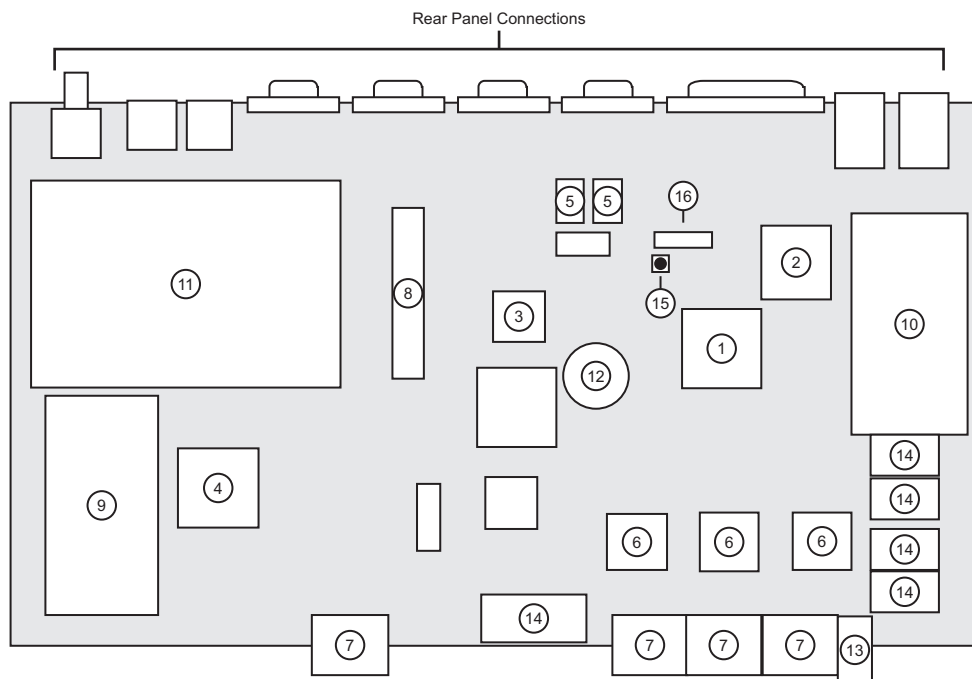
CPU Board — Functional Components

1) CPU	7) Midplane Connectors	12) Battery
2) Ethernet Transceiver	8) ATA Connector	13) Power Connector
3) UART	9) Global-Store and MediaCache Memory	14) Power Converter
4) Global Store and Preview Overlay FPGA	10) System Memory	15) Reset Button
5) Flash Memory	11) Hard Disk	16) DIP Switch
6) Ethernet Switch		

1. CPU

The Central Processing Unit (CPU) on the CPU Board is a 32-bit 440GX PowerPC 533 Mhz processor. It controls the high-level communications for all the system peripherals on the frame.

2. **Ethernet Transceiver**

   The 10/100 Ethernet transceiver controls the two external LAN ports found on the rear panel of the frame CPU Board. Refer to the section "**CPU Board Rear Panel**" on page 14-16 for a more detailed description of the external LAN ports.

3. **UART**

   The Universal Asynchronous Receive and Transmit (UART) provides external serial communication through the four DB-9 connectors and through the RJ-45 control panel connector.

4. **Global-Store and Preview Overlay FPGA**

   The CPU Board uses an FPGA to implement the Global-Store and Preview Overlay.

5. **Flash Memory**

   The two flash memory chips provide 64MB of memory for CPU code storage.

6. **Ethernet Switch**

   The 22-port 10/100 Ethernet switch controls the internal, ethernet based, communication that is used between the CPU Board and all the other boards connected to the midplane.

7. **Midplane Connectors**

   The CPU Board has four 20-pair connectors that connect to the midplane when the CPU Board is installed. These connectors use Ethernet and SMPTE protocols to communicate and pass video signals with other boards connected to the midplane.

8. **ATA Connector**

   The ATA connector provides the interface for the hard disk to the CPU Board.

9. **Global-Store and MediaCache Memory**

   This 200-pin DDR SODIMM socket is populated with a 256 MB DDR SDRAM module that is dedicated as a graphic buffer. This module can be upgraded to 1 GB with the MediaCache™ upgrade.

10. **System Memory**

    This 200-pin DDR SODIMM socket is populated with a 256MB DDR SDRAM module that is dedicated as system memory.

11. **Hard Disk**

    The hard disk drive is a 2.5 inch, 80GB, Ultra ATA drive that is mounted directly onto the CPU Board. It provides storage for Still Stores and additional memory sets, as well as a backup of the software for all the cards in the system.

12. **Battery**

    The battery is used to maintain the non-volatile memory when the CPU Board is powered down. If the battery needs to be replaced, use a 3V Lithium CR 2032 type battery.

13. **Power Connector**

    The CPU Board has a single power connector that connects to the midplane when the CPU Board is installed.

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14. Power Converter

The CPU Board uses five non-isolated power converters to generate the voltages that are needed by the various components on the board.

15. Reset Button

The reset button provides a local, hard reset of the board, and should only be used for diagnostic purposes.

16. DIP Switch

This 8 switch DIP sets various system configurations and operational modes for the entire Synergy 100 MD switcher. All DIP switches should be in the **OFF** position for normal operation of the Synergy 100 MD switcher.

⚠	**Caution**	Incorrect DIP switch settings may make your switcher inoperable. If your switcher does not appear to boot and will not pass a video signal, check that all DIP switches are in the **OFF** position. Do not change the position of the DIP switches unless instructed to do so by **Ross Video Technical Support**.

DIP Switch 1 may be set to **ON** to override the network IP address and netmask of your switcher. You may wish to set this if you need to access your switcher via the web interface and do not have access to the control panel and do not know the current IP address.

Setting DIP Switch 1 to **ON** will set the switcher IP address to 192.168.1.1 and the netmask to 255.255.0.0 the next time the switcher is restarted. When you turn DIP Switch 1 **OFF**, the switcher reverts to the previously saved IP address and netmask the next time it is restarted.

If you attempt to change the switcher network settings while DIP Switch 1 is **ON**, a warning message is displayed indicating that the IP address will revert to 192.168.1.1 and the netmask to 255.255.0.0 the next time the switcher is restarted unless you turn DIP Switch 1 **OFF**.

CPU Board Rear Panel

The rear panel of the CPU Board has six different types of connections. These connections allow the frame to communicate with serial peripheral, USB, and GPI devices, as well as connect to the control panel and other ethernet networks.
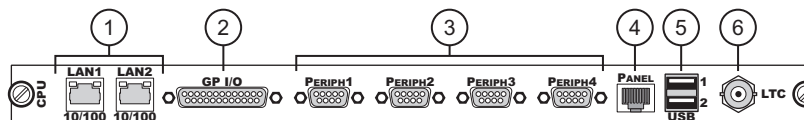
CPU Board — Rear Panel

1) LAN Connectors	3) Peripheral Ports	5) USB Ports
2) GPI I/O Port	4) Panel Connector	6) Time Code Input

1. LAN Connectors

The two 10/100 Base TX Ethernet connectors allows the connection of the frame to a network for upgrades, as well as support Automatic MDI Crossover (Auto-MDIX). The Auto-MDIX will detect the position of the transmit and receive cable pairs on the

connected device and swap them if needed. This means that there is no need for a crossover cable.

2. **GPI I/O Port**

   The General Purpose Interface (GPI) port allows the connection of an interface device that will typically control the auto transition functions.

3. **Peripheral Ports**

   The four 9-pin integrated serial ports support the RS-232 and RS-422 standards to allow the connection of various serial peripheral devices. The appropriate software may need to be installed in order to properly communicate with these devices.

4. **Panel Connector**

   The RJ-45 panel connector is used to connect the frame to the control panel. This connection is hard-wired on the CPU Board, so no software setup is required.

Important

> The cable for connecting the Synergy Control Panel to the Synergy Frame is *not* wired as a standard CAT5 ethernet cable. If you need a cable of a specific length, contact your Ross Video Representative for ordering information.

5. **USB Ports**

   The two integrated USB ports allow the connection of USB peripheral devices.

6. **Time Code Input**

   The time code input allows the system to be synchronized to an external time reference.

Video Processor Board

The Video Processor Board (4800A-040) performs all the non-Squeeze & Tease video manipulation for the system. This manipulation includes all the keyers, transitions, washes, pattern rotation and manipulation, and wipes.

This section will identify and describe the various functional components found on the Video Processor Board.

Video Processor Board Functional Components

The Video Processor Board has slots for two daughter cards, plus the command and power infrastructure required to support these cards. This infrastructure includes the on-board processor, system memory, graphics buffers, video core, video interface and configuration FPGAs, as well as various power converters, a reset button, and system status or system communication indicators.
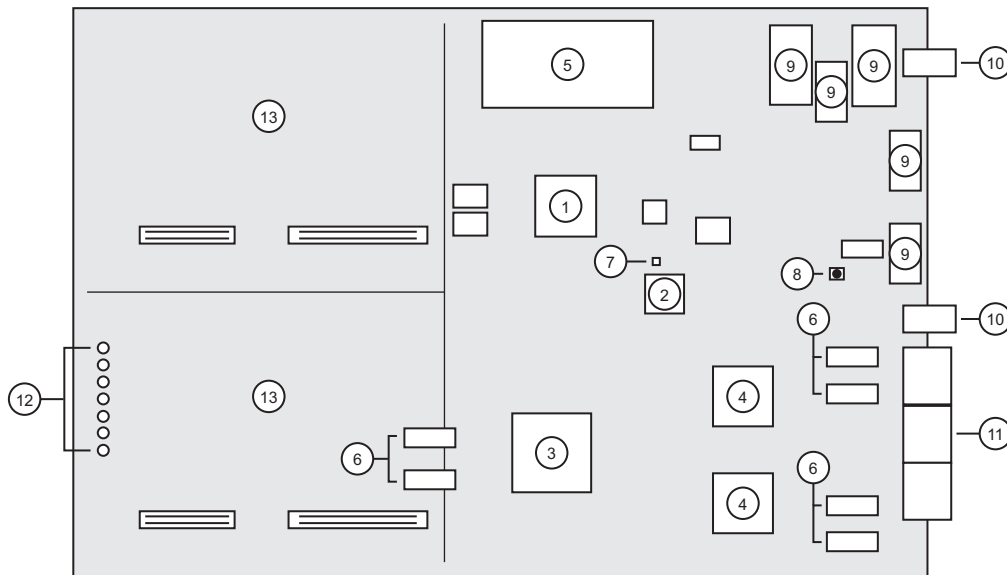
Video Processor Board — Functional Components

1) On-Board Processor	6) System Buffers	10) Power Connectors
2) Configuration FPGA	7) Temperature Sensor	11) Midplane Connectors
3) Video Core FPGA	8) Reset Button	12) System Indicators
4) Video Interface FPGA	9) Power Converters	13) Future Expansion Card Slots
5) System Memory		

1. On-Board Processor

The PowerPC on-board processor governs the on-board communication and control, as well as the communication with the midplane.

2. Configuration FPGA

The configuration FPGA routes the configuration communication between the on-board processor and the video core and interface FPGAs.

3. Video Core FPGA

The video core FPGA governs all the video signal manipulation on the board.

4. **Video Interface FPGA**

   Two video interface FPGAs are used to route all the video signals from the midplane to the video core FPGA.

5. **System Memory**

   This 200-pin DDR SODIMM socket is populated with a DDR SDRAM module that is dedicated to the on-board processor as system memory.

6. **System Buffers**

   Three SDRAM pairs are provided as buffers for the video core and video interface FPGAs.

7. **Temperature Sensor**

   A temperature sensor is used to ensure that the board is not operated beyond a set temperature threshold. This temperature information is used by the frame to regulate the operation of the cooling fans.

8. **Reset Button**

   The reset button provides a local, hard reset of the board, and should only be used for diagnostic purposes.

9. **Power Converters**

   There are five non-isolated power converters to generate the voltages that are needed by the various components on the board.

10. **Power Connectors**

    There are two power connectors that connect to the midplane when the Video Processor Board is installed.

11. **Midplane Connectors**

    The Video Processor Board has three 20-pair connectors that connect to the midplane when the board is installed. These connectors use Ethernet and SMPTE protocols to communicate and pass video signals with other boards connected to the midplane.

12. **System Indicators**

    There are seven system indicators on the board that show various system states or communications. The CAN and Ethernet indicators show the communication activity on the board. The heartbeat, reset, and power indicators show the software, reset and power status on the board.

13. **Future Expansion Card Slots**

    These two slots will accommodate future expansion cards.

Squeeze & Tease Carrier Board

The Synergy 100 MD switcher uses the Squeeze & Tease Carrier Board (4800A-047) to support up to two Squeeze & Tease WARP MD Cards, four Squeeze & Tease MD Cards and the Squeeze & Tease DSP Card. These cards allow you to perform various planar and pixel manipulation on the video signal.

Squeeze & Tease Carrier Board Functional Components

The Squeeze & Tease Carrier Board has slots for seven daughter cards, plus the command and power infrastructure required to support these cards. This infrastructure includes the on-board CPU, system and video memory, various power converters, reset buttons and system status or system communication indicators.
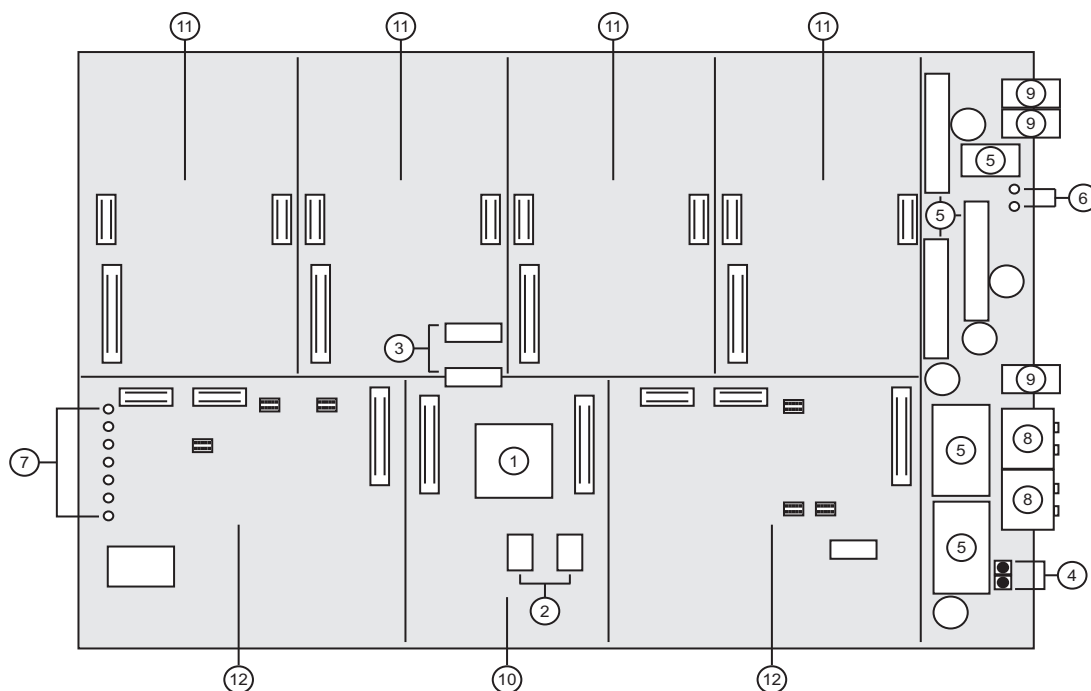
Squeeze & Tease Carrier Board — Functional Components

1) On-Board Processor	5) Power Converters	9) Power Connectors
2) Flash Memory	6) Power Indicators	10) Squeeze & Tease DSP Card Slot
3) On-Board System Memory	7) System indicators	11) Squeeze & Tease MD Card Slot
4) Reset Button	8) Midplane Connectors	12) Squeeze & Tease WARP MD Slot

1. On-Board Processor

The PowerPC On-Board Processor governs the on-board communication and control, as well as the communication with the Midplane and the daughter cards mounted on the board.

2. Flash Memory

The two Flash Memory chips provide 64MB of permanent storage for the On-Board Processor.

3. **On-Board System Memory**

   There are two SDRAM chips used for system memory.

4. **Reset Button**

   The two reset buttons provide a local, hard reset of the On-Board Processor and the entire Squeeze & Tease Carrier Board, and should only be used for diagnostic purposes.

5. **Power Converters**

   There are six Non-Isolated Power Converters to generate the voltages that are needed by the various components on the board.

6. **Power Indicators**

   There are two Power Indicators that illuminate to show power status. There are for diagnostic purposes only.

7. **System Indicators**

   There are seven System Indicators on the board that show various system states or communications. The CAN and Ethernet indicators show the communication activity on the board. The Heartbeat, Reset and Power indicators show the software, reset and power status on the board.

8. **Midplane Connectors**

   The Squeeze & Tease Carrier Board has two 20-pair connectors that connect to the Midplane when the board is installed. These connectors use Ethernet and SMPTE protocols to communicate and pass video signals with the other boards connected to the midplane.

9. **Power Connectors**

   There are four Power connectors that connect to the midplane when the Squeeze & Tease Carrier Board is installed.

10. **Squeeze & Tease DSP Card Slot**

    This single slot will only accommodate the Squeeze & Tease DSP Card.

11. **Squeeze & Tease MD Card Slot**

    These four slots will only accommodate the optional Squeeze & Tease MD Cards.

Note The Squeeze & Tease DSP Card and at least one Squeeze & Tease MD Card must be installed in order for the system to operate properly.

12. **Squeeze & Tease WARP MD Card Slot**

    There two slots will only accommodate the optional Squeeze & Tease WARP MD Cards.

Squeeze & Tease DSP Card

The Squeeze & Tease DSP Card (4800A-046) provides the interface between the Squeeze & Tease Carrier Board and the other cards installed on the board. This allows these cards to communicate with the frame, and each other, as well as receive status and configuration control information from the Squeeze & Tease DSP Card.

This section will identify and describe the various functional components found on the Synergy 100 MD frame Squeeze & Tease DSP Card.

	Note	The Squeeze & Tease DSP Card can only be installed in the Squeeze & Tease DSP Card Slot on the Squeeze & Tease Carrier Board.

The Squeeze & Tease DSP Card Functional Components

The Squeeze & Tease DSP Card has seven primary components that are used for the operation and communications of the card. These are the DSP processor, Interface FPGA, Flash and DSP memory, as well as various diagnostic connectors and indicators.
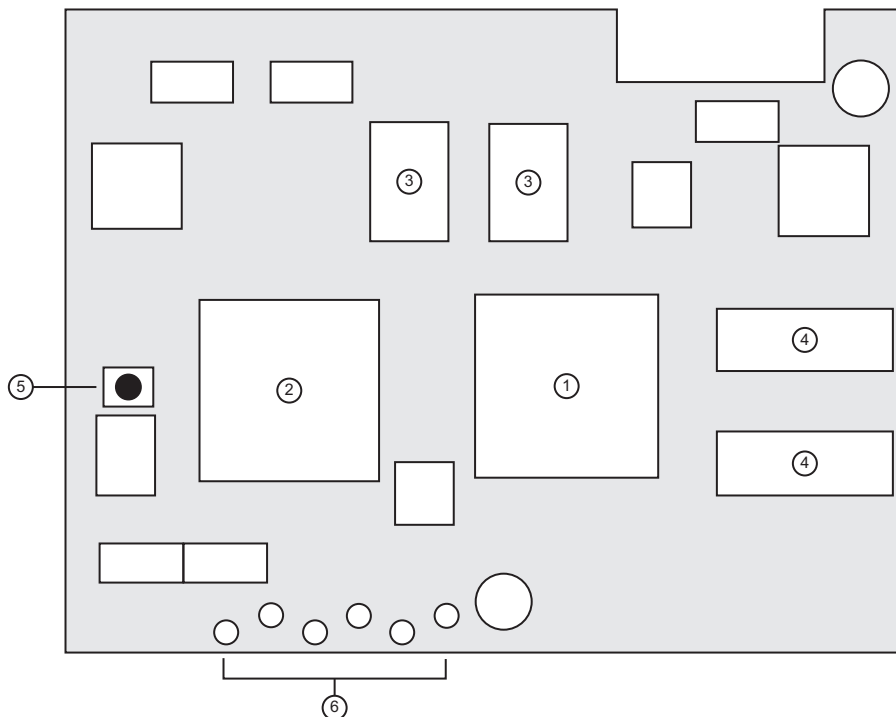
Squeeze & Tease DSP Card — Functional Components

1) DSP Processor	3) Flash Memory	5) Reset
2) Interface FPGA	4) DSP Memory	6) Diagnostic Indicators

1. DSP Processor

The Fixed Point Digital Signal Processor (DSP) performs all the calculations needed for each video field, including borders.

2. **Interface FPGA**

   The Interface FPGA provides the communication and configuration control for the interface between the Squeeze & Tease Carrier Board and the daughter cards installed on it.

3. **Flash Memory**

   The two Flash Memory chips provide 64MB of permanent storage for the DSP.

4. **DSP Memory**

   There are two SDRAM chips used for system memory for the DSP.

5. **Reset**

   The Reset button provides a hard, local, reset for the card and should only be used for diagnostic purposes.

6. **Diagnostic Indicators**

   The six indicators show the different operational states for diagnostic purposes.

Squeeze & Tease MD Card

The Squeeze & Tease MD Card (4800A-048) performs all the Squeeze & Tease video manipulation for the system. It provides all the planar processing, pre-processing, lighting, bordering and filtering. Each card supports up to ten high-speed digital channels for SDI or HD-SDI video signals. Two of these channels are routed to the rest of the frame, two are routed to the previous Squeeze & Tease MD Cards, two are routed to the next Squeeze & Tease MD Cards and another two are routed to the optional Squeeze & Tease MD WARP Cards. These channels are synchronized using a single-ended V-Sync signal.

This section will identify and describe the various functional components found on the Synergy 100 MD frame Squeeze & Tease MD Card.

Note | The Squeeze & Tease MD Cards can only be installed in the four Squeeze & Tease MD Card Slot on the Squeeze & Tease Carrier Board.

The Squeeze & Tease MD Card Functional Components

The Squeeze & Tease MD Card has five primary components used for the operation and communication of the card. These are the Channel Processor, Buffers, Power Regulators, Temperature Sensor and Diagnostic Indicators.
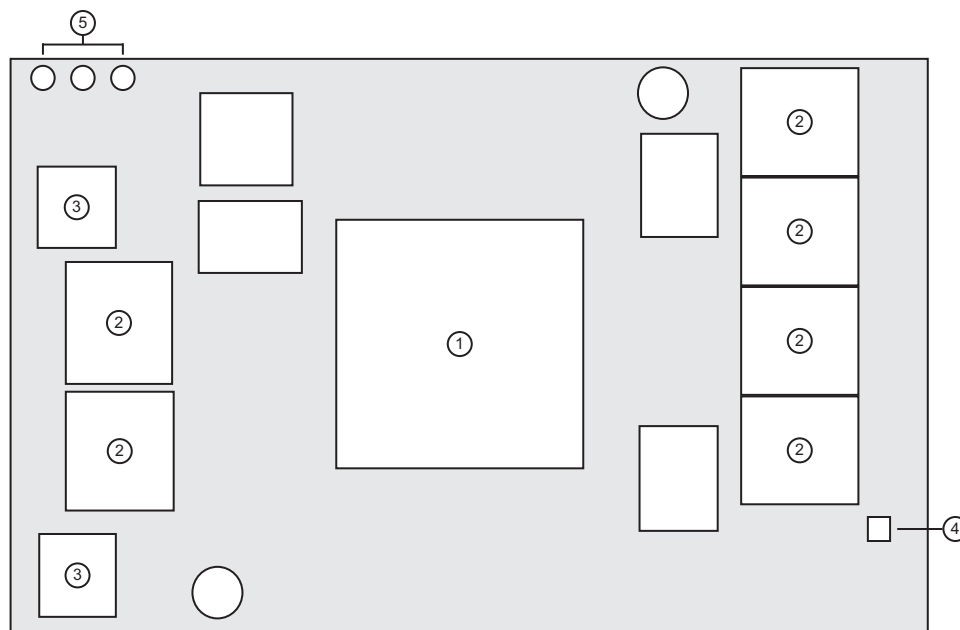
Squeeze & Tease MD Card — Functional Components

1) Channel Processor FPGA	3) Power Regulators	5) Diagnostic Indicators
2) Video Buffers	4) Temperature Sensor	

1. Channel Processor FPGA

The Channel Processor FPGA performs all the video manipulation and channel assignments for the card. Channels are routed to and from the Channel Processor FPGA using high-speed serial link that pass the video signals between the Video Processor Board and the Squeeze & Tease MD WARP Card.

2. **Video Buffers**

   There are eight Quad Data Rate (QDR) Static Random Access Memory (SRAM) buffers that are used by the Channel Processor FPGA. Two of the buffers are located on the underside of the card and are not visible when it is installed.

3. **Power Regulators**

   There are two power regulators installed on the card to regulate the voltages that are needed by the components on the card.

4. **Temperature Sensor**

   A one-wire temperature sensor is used to ensure that the card is not operated beyond a set temperature threshold. This temperature information is used by the frame to regulate the operation of the cooling fans.

5. **Diagnostic Indicators**

   Three diagnostic indicators are used to show operation of the card.

Squeeze & Tease MD WARP Card

The Squeeze & Tease MD WARP Card (4800AR-049) performs all the 3D WARP effects for the system. There are two high-speed digital channels for SDI or HD-SDI video between the Warp card and the Squeeze & Tease MD card.

This section will identify and describe the various functional components found on the Synergy MD frame Squeeze & Tease MD WARP Card.

✎	**Note**	The Squeeze & Tease MD WARP Cards can only be installed in the two Squeeze & Tease MD WARP Card Slots on the Squeeze & Tease Carrier Board.

Squeeze & Tease MD WARP Card Functional Components

The Squeeze & Tease MD WARP Card has five primary components used for the operation and communication of the card. These are the FPGA, DSPs, RAM, flash memory, and diagnostic indicators.
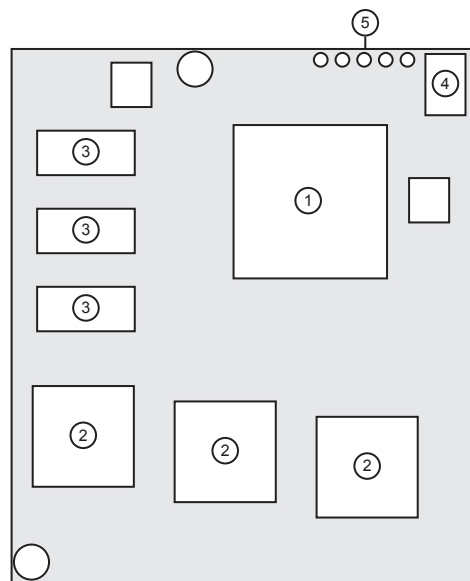
Squeeze & Tease MD WARP Card — Functional Components

1) Channel Processor FPGA	3) DDR SDRAM	5) LED Diagnostic Indicators
2) DSPs	4) Flash Memory	

1. Channel Processor FPGA

The FPGA (Field Programmable Gate Array) performs the glue-logic functions connecting the complex circuits of the WARP card together. It also provides a DDR memory interface and handles memory bus arbitration.

2. DSPs

There are three 1 GHz DSPs (Digital Signal Processors) on the WARP card that handle all the calculations necessary for providing the various 3-D WARP effects.

3. **DDR SDRAM**

   There are six DDR SDRAM (Double Data Rate Synchronous DRAM) chips (three on each side of the WARP card) providing system memory for the three DSPs.

4. **FLASH Memory**

   The flash RAM (Random Access Memory) provides permanent shared storage space for the three DSPs.

5. **LED Diagnostic Indicators**

   The diagnostic indicators are used to show operation of the card.

Control Panel Boards

In This Chapter

This chapter provides details about each "switch" board in the Synergy 100 MD control panel, plus the control panel's CPU Board layout.

⚠ **Important**   Do not open the Synergy 100 control panel without express instructions from Ross Video Technical Support.

The following topics are discussed:

- • Control Panel Boards
- • Panel CPU Board Layout
- • Basic Interconnections

Control Panel Boards

The figure below illustrates a view *underneath* the Synergy 100 MD control panel.

Front Edge
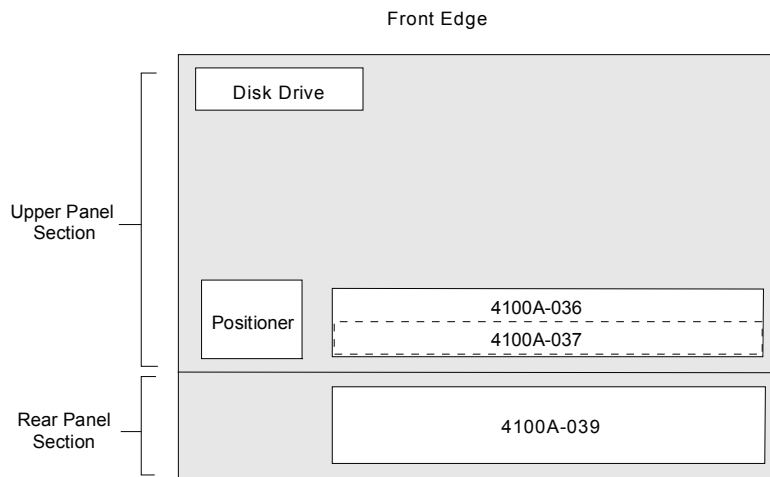
Underside View — Synergy 100 MD Control Panel

⚠	**Important**	Do not open the Synergy 100 control panel without express instructions from Ross Video Technical Support.

In the upper control panel section:

- **4100A-036** — buttons and indicators in the **Pattern Control Group**.
- **4100A-037** — display board, which contains the three four-character displays and the four seven-segment displays.

In the rear control panel section:

- **4100A-039** — I/O board, which houses all the connectors for panel-to-frame communication. Also included are the connectors for the 16 standard panel tallys, the connector for the disk drive, and the connector for the DC power supply.

Panel CPU Board Layout

The figure below illustrates the Synergy 100 MD Control Panel CPU Board (4100AR-033).
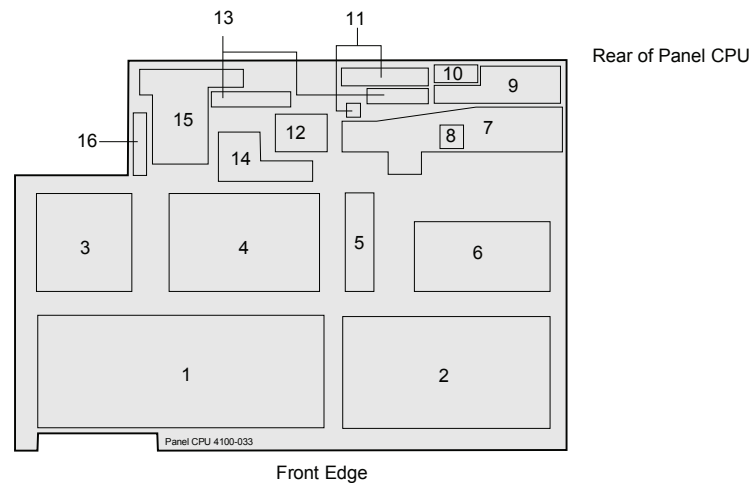
Synergy 100 MD Control Panel CPU Board — Functional Blocks

> **Important**   Do not open the Synergy 100 control panel without express instructions from Ross Video Technical Support.

The major functional blocks are described below:

1. This area contains the buttons for the PGM, PST, and Key buses.

2. This area includes all the transition control buttons and the fader.

3. In this area are all the buttons and potentiometers for the Effects Control group.

4. This section contains all the buttons and knobs in the Effects Keyer group.

5. The knobs for the Mattes group are located in this area.

6. This area contains the buttons and potentiometers in the Downstream Keyer group.

7. The FPGA with its 2.5V power components, the microprocessor, and the memory chips are all located in this area.

8. One socketed IC is provided for the panel's boot prom.

9. This area contains the 3.3-volt power distribution components. These provide the power supply for most circuit boards and LEDs in the panel.

10. This area contains the communications LEDs and the reset switch.

11. This section includes the USB controller and the FDC and communication connector.

12. This area contains the 5V digital power components that run the communications drivers.

13. These two areas contain the daughter board power connector and the data cable connector.

14. The 5V analog power, which supplies power to all analog devices, and all the analog-to-digital conversion components are located in this area.

15. This area provides the relays for the panel's standard 16 primary tallies and the tally and communication connector.

16. This is the connector for the positioner.

Basic Interconnections

This section describes the basic types of interconnections on the control panel boards.

- In the Synergy 100 MD control panel, there are two 50-pin ribbon cables that run from the Display Board (**4100A-037**) to the **4100A-036**, and then to the Panel CPU Board (**4100AR-033**).

The ribbon cable connectors are the same, but the orientation of each connector allows it to be attached only in one place.

⚛	**Important**	Do not open the Synergy 100 control panel without express instructions from Ross Video Technical Support.

Please note:

- The faders are connected through a 16-pin dip-style socketed connector, with an indicator that shows the location of pin 1.
- The panel's Positioner connects with a 16-pin ribbon cable.
- The **4100A-039** board is connected using edge card fingers that are inserted into connectors on the Panel CPU Board (**4100AR-033**).
- The USB drive is connected to the **4100A-039** board with a 26-pin ribbon cable.

Hardware Options

In This Chapter

This chapter provides information for installing the various hardware options that are available for your Synergy 100 MD Switcher. If you wish to add any of these options to your switcher, contact **Ross Video Technical Support** for ordering information.

The following topics are discussed:

- Hardware Option Overview
- MediaCache™ Option
- Hard Drive Replacement
- Squeeze & Tease MD Option

ESD Susceptibility	Avoid handling any electronic circuit boards in high static environments, such as carpeted areas, and when wearing synthetic fiber clothing. Touch the frame to dissipate static charge before removing boards from the frame, and exercise proper grounding precautions when working on circuit boards.

Hardware Option Overview

The following option cards and modules may be installed in the switcher to provide additional functionality:

- The **MediaCache** option increases the Global-Store memory on the frame CPU Board, allowing animated logos, moving graphics, and short uncompressed clips to be played from the Global-Store.

    ~ Requires one **1 GB DDR SDRAM Module**.

- The **Squeeze & Tease MD** option allows you to Fly Keys, perform pre-processor, lighting, picture frame border and sequence effects.

    ~ Requires a **Squeeze & Tease Carrier Board** with at least one **Squeeze & Tease MD Card**.

MediaCache™ Option

The **MediaCache** upgrade for the Synergy 100 MD switcher increases the Global-Store and MediaCache memory on the CPU Board of the frame. This upgrade allows animated logos, moving graphics, and short uncompressed clips to be played from the Global-Store.

The MediaCache option consists of both a hardware upgrade and software that enables this feature. For the hardware component, the existing **256 MB DDR SDRAM** module is removed and replaced with a larger **1 GB DDR SDRAM** module. The new feature is then enabled using a software access code provided by **Ross Video Technical Support**.

Upgrading the MediaCache Memory

The MediaCache upgrade requires that you replace the existing Global-Store and MediaCache memory module with a new, larger memory module. This procedure requires you to power down the frame and remove the CPU Board.

In order to upgrade the MediaCache Memory you will have to power down your switcher, remove the CPU board from the frame, install the MediaCache Memory Module, re-install the CPU board into the frame, and power up the switcher.

Shutdown the Switcher

Use the following procedure to shutdown the switcher:

1. Navigate to the **Default Menu** as follows:

   • Press **MENU** to display the **Main Menu**.

   • Press **7. Options** to display the **Options Menu**.

   • Press **5. System Resets** to display the **System Resets Menu**.

```
Options S/N:XXXXXXXXXX

0. Network Setup           5. System Resets
1. Software Options
2. Panel ID      XXXX-X
3. Panel SW      X.X
4. Frame ID      XXXX-X




MENU   100      10    1     SEL
Exit   Previous Down  Up    Accept
```

System Resets Menu

2. Press **1. System Shutdown** to display the **System Shutdown Confirmation Screen**.

Are you sure you want to SHUTDOWN the system?

0. Confirm   1. Cancel

| 10 | 1 | SEL |
| Down | Up | Accept |
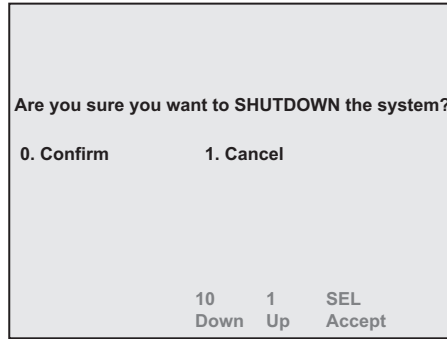
System Shutdown Confirmation Screen

3. Press **0. Confirm** to shutdown the switcher.

This completes the procedure for shutting down the switcher. Next you will have to remove the CPU Board from the frame.

Removing the CPU Board

Use the following procedure to remove the CPU Board:

1. Remove the front cover of the frame.
2. Locate the power supplies on the right side of the frame.
3. Toggle each of the power supply switches to **OFF** to power down the frame.
4. Locate the **CPU Board** in **Slot A** at the back of the frame.

Locking Screw   Locking Screw
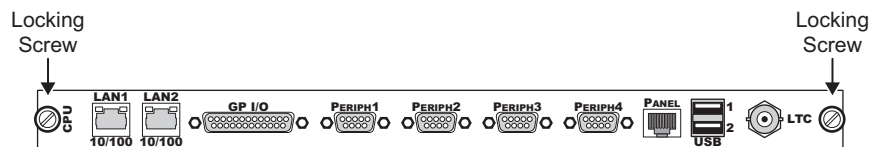
CPU Board — Rear Panel

| | **Note** | You may want to label the cables connected to the back of the frame so that they can be easily reconnected when you have completed this procedure. |

5. Remove all the cables connected to the CPU Board.
6. Unscrew the **Locking Screws** located at either end of the rear panel of the CPU Board.

| | **Caution** | Always remember to ground yourself by touching the chassis or wearing a grounded wrist strap before handling any electronic components. |

7. Remove the **CPU Board** by sliding it out of slot in the frame.

Synergy MD — CPU Board Removal

8. Place the **CPU Board** on a clean, static free surface.

With the CPU Board removed from the frame, you can now replace the existing Global-Store and MediaCache module with the new MediaCache module.

Installing the MediaCache Memory Module

Use the following procedure to install the **MediaCache Memory Module**:

1. Locate the **MediaCache** on the **CPU Board**.
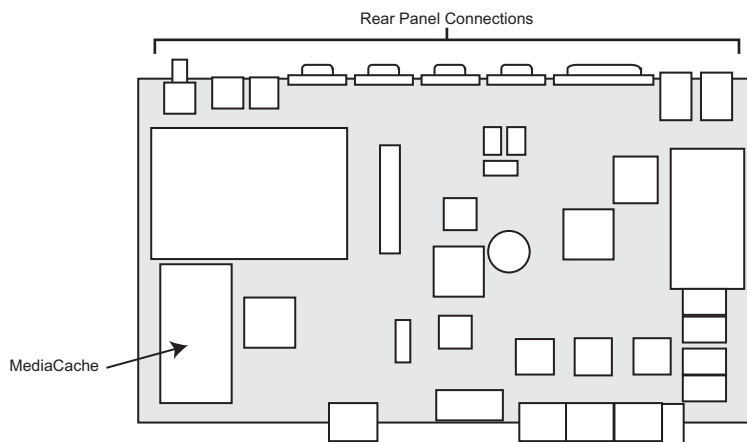
CPU Board — MediaCache Location

> ⚠ **Caution** Always remember to ground yourself by touching the chassis or wearing a grounded wrist strap before handling any electronic components.

2. Using your thumbs, spread the **Retaining Clips** on either side of the **Memory Socket** outward until the **Memory Module** is released.
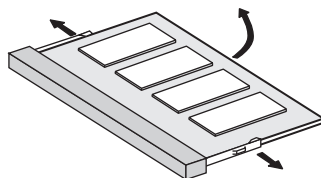
Removing the Memory Module

3. Grasping the **Memory Module** by the edge, remove it from the **Memory Socket** and place it on a clean, static free surface.

4. Gently slide the new **MediaCache Memory Module** down at an angle into the **Memory Socket** you just removed the memory module from.
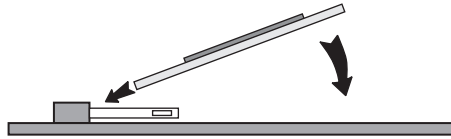
MediaCache Memory Module

5. Gently push the **MediaCache Memory Module** down into place until the two **Retaining Clips** click shut and secure the **MediaCache** in the **Memory Socket**.

With the new **MediaCache** module installed on the **CPU Board**, you will reinstall the **CPU Board** in the frame.

Reinstalling the CPU Board

Use the following procedure to replace the **CPU Board**:

1. Ensure that the frame is powered **OFF**.

2. Slide the **CPU Board** into **Slot A** at the back of the frame until it is fully seated.

3. Screw in the **Locking Screws** at either end of the rear panel of the **CPU Board** to secure the board in place.

4. Reconnect the cables to the rear panel of the **CPU Board**.

5. Locate the power supplies on the right side of the frame.

6. Toggle the power supply switches to **ON** in order to power up the frame.

7. Replace the front cover of the frame.

This completes the procedure for installing the hardware component of the MediaCache option. Refer to the section "**Installed Options**" on page 6-31 for details on activating the software component.

Hard Drive Replacement

In the event that the hard drive that is in your Synergy 100 MD switcher needs to be replaced, a spare hard drive with the current shipping version of the software pre-loaded on it is provided in the spare parts kit.

	Note	The software provided on the spare hard drive should be the current shipping version at the time the hard drive was imaged. This may not be the newest version of software available. Refer to the section "**Software Upgrade**" on page 6-10 for the procedure to upgrade your software. Once you have installed the spare hard drive you should contact **Ross Video** for the most current version of the software.

Replacing the Hard Drive

In order to replace your hard drive you will have to power down your switcher, remove the CPU board from the frame, replace the hard drive, re-install the CPU board into the frame, and power up the switcher.

Shutdown the Switcher

	Important	Ensure that you backup all the stills and setup that you have stored on the hard drive before you remove it, if it is possible to do so. Refer to the section "**System Backup**" on page 6-10 for more information.

Use the following procedure to shutdown the switcher:

1.   Navigate to the **Default Menu** as follows:

   •   Press **MENU** to display the **Main Menu**.

   •   Press **7. Options** to display the **Options Menu**.

   •   Press **5. System Resets** to display the **System Resets Menu**.

```
Options S/N:XXXXXXXXX

0. Network Setup          5. System Resets
1. Software Options
2. Panel ID        XXXX-X
3. Panel SW        X.X
4. Frame ID        XXXX-X




MENU    100        10     1     SEL
Exit    Previous   Down   Up    Accept
```

System Resets Menu

2.   Press **1. System Shutdown** to display the **System Shutdown Confirmation Screen**.

Are you sure you want to SHUTDOWN the system?

0. Confirm   **1. Cancel**

10   1   SEL
Down   Up   Accept

System Shutdown Confirmation Screen

> 3. Press **0. Confirm** to shutdown the switcher.

This completes the procedure for shutting down the switcher. Next you will have to remove the CPU Board from the frame.

Removing the CPU Board

Use the following procedure to remove the **CPU Board** from the frame:

> 1. Remove the front cover of the frame.
> 2. Locate the power supplies on the right side of the frame.
> 3. Toggle each of the power supply switches to **OFF** to power down the frame.
> 4. Locate the **CPU Board** in **Slot A** at the back of the frame.
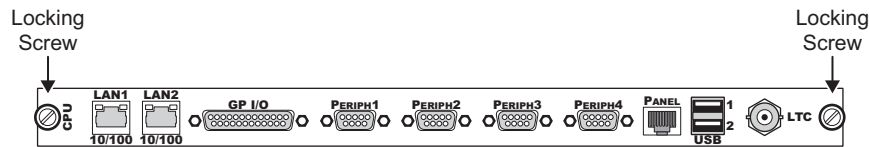
CPU Board — Rear Panel

| ✎ | **Note** | You may want to label the cables connected to the back of the frame so that they can be easily reconnected when you have completed this procedure. |

> 5. Remove all the cables connected to the **CPU Board**.
> 6. Unscrew the **Locking Screws** located at either end of the rear panel of the **CPU Board**.

| ⚠ | **Notice** | Always remember to ground yourself by touching the chassis or wearing a grounded wrist strap before handling any electronic components. |

> 7. Remove the **CPU Board** by sliding it out of slot in the frame.
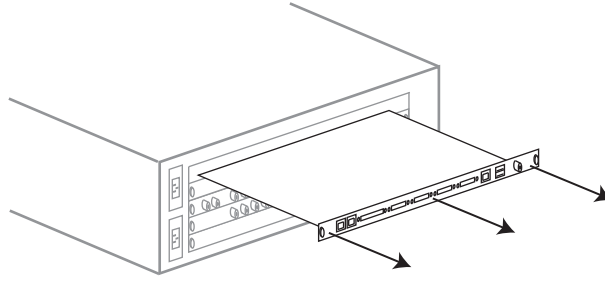
Synergy MD — CPU Board Removal

8. Place the **CPU Board** on a clean, static free surface.

With the **CPU Board** removed from the frame, you can now replace the existing **Hard Drive** with the replacement **Hard Drive**.

Replacing the Hard Drive

Use the following procedure to replace the **Hard Drive**:

1. Locate the **Hard Drive** on the **CPU Board**.
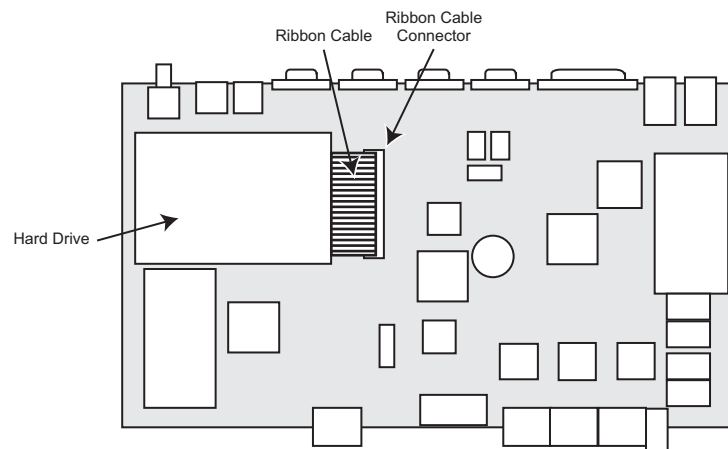
CPU Board — Hard Drive Location

⚠	**Notice**	Always remember to ground yourself by touching the chassis or wearing a grounded wrist strap before handling any electronic components.

2. Release the **Ribbon Cable** from the **Ribbon Cable Connector** by pressing down and out on the **Ejector Tabs** at either end of the **Ribbon Cable Connector**.
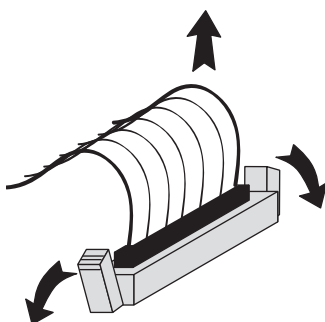
Releasing the Ribbon Cable

3. Flip the **CPU Board** over so that the Hard Drive is facing down.

4. Locate the four **Retaining Screw** securing the **Hard Drive** in place.
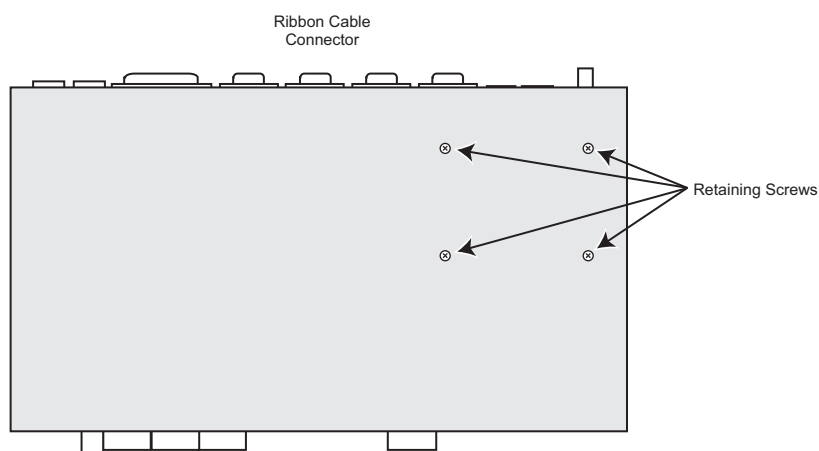
CPU Board — Retaining Screws Location

5. Using a non-magnetic (electronics safe) screwdriver, remove the **4 Retaining Screws** securing the **Hard Drive**.

6. While holding the **Hard Drive** to the **CPU Board**, flip the **CPU Board** back over so that the **Hard Drive** is facing up again.

Note Ensure that you do not damage the rubber spacers located at each screw hole when you remove the **Hard Drive**.

7. Remove the **Hard Drive** from the **CPU Board** and place in a safe location.

8. Remove the **Ribbon Cable** from the **Hard Drive** you just removed and install it onto the replacement **Hard Drive** using the **44** pin **Hard Drive Ribbon Cable Pins**. Ensure

that the stripe on the **Ribbon Cable** is aligned towards the four unused pins as illustrated.
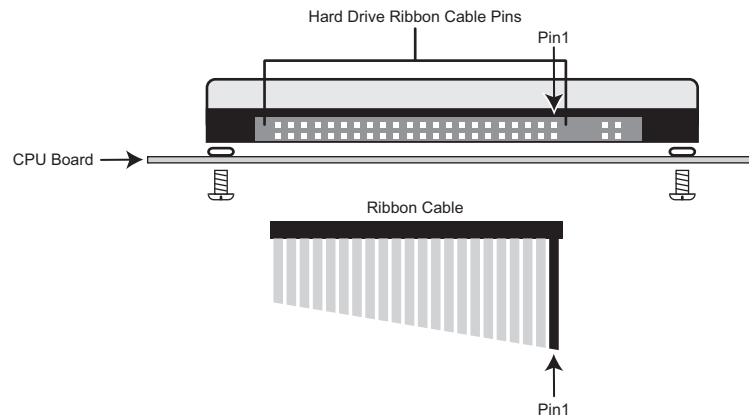
CPU Board — Ribbon Cable Alignment

Warning

Ensure that you connect the **Ribbon Cable** to the pins illustrated. If the **Ribbon Cable** is not properly connected your **Hard Drive** could be damaged when the switcher is powered On.

9. Ensuring that the **Rubber Spacers** are in place, install the replacement **Hard Drive** using the **4 Retaining Screws** you removed.
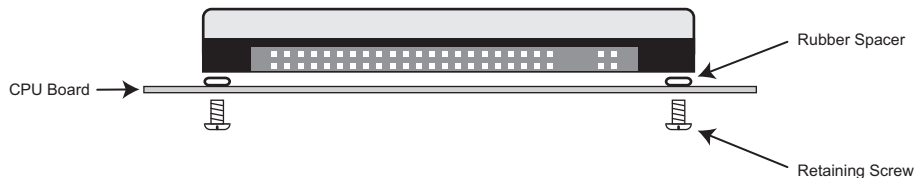
CPU Board — Screws

Caution

Do not overtighten the **Retaining Screws**. These screws only need to be snug in order to secure the **Hard Drive** in place.

10. Push the **Ribbon Cable** into the **Ribbon Cable Connector** until the **Ejector Tabs** at either end of the **Ribbon Cable Connector** close together, securing the **Ribbon Cable** in place.

With the replacement **Hard Drive** installed on the **CPU Board**, you will reinstall the **CPU Board** in the frame.

Reinstalling the CPU Board

Use the following procedure to replace the **CPU Board**:

1. Ensure that the frame is powered **OFF**.

2. Slide the **CPU Board** into **Slot A** at the back of the frame until it is fully seated.

3. Screw in the **Locking Screws** at either end of the rear panel of the **CPU Board** to secure the board in place.

4. Reconnect the cables to the rear panel of the **CPU Board**.

5. Locate the power supplies on the right side of the frame.

6. Toggle the power switches to **ON** in order to power up the frame.

7. Replace the front cover of the frame.

This completes the procedure for installing a replacement Hard Drive. You may have to reset your network configurations or update your software version. Refer to the section "**Network Setup**" on page 6-2 for more information.

Squeeze & Tease MD Option

The Squeeze & Tease™ MD option consists of a carrier board and a number of daughter cards that are installed into the Synergy 100 MD frame.

In order to install the Squeeze & Tease MD option, you will have to upgrade the switcher software, install the daughter cards onto the Squeeze & Tease Carrier Board, and install the Squeeze & Tease Carrier Board into the frame.

The hardware for the Squeeze & Tease MD option consists of a Squeeze & Tease MD Carrier Board with slots for two Squeeze & Tease MD Cards, each providing **2** Squeeze & Tease resources, a slot for one DSP Card, and slots for one Squeeze & Tease WARP MD Card.

Installing the Squeeze & Tease MD Option

In order to install the Squeeze & Tease MD option, you must update the switcher software, install the daughter cards onto the Squeeze & Tease Carrier Board, and install the carrier into the frame.

If you are adding Squeeze & Tease MD Cards or Squeeze & Tease WARP MD Cards to an existing Squeeze & Tease Carrier Board, you must remove the board from the frame, install the daughter cards and then reinstall the Squeeze & Tease Carrier Board into the frame. Refer to the section "**Removing Front Frame Circuit Boards**" on page 3-16 for information on removing frame circuit boards.

| ⊛ | **Important** | Although the **Squeeze & Tease Carrier Boards** are hot-swappable, any Squeeze & Tease resources on those cards that are being used, Flying Keys for example, will be lost when the board is removed. |

Upgrading the Software

When a new board is installed, the switcher checks the current version of software on the board. If the software on the board is the same as the software on the switcher, there is no change. If the board has a software version that is different than the version on the switcher, the switcher will upgrade the board to the same version as the switcher. For this reason it is important that you upgrade your switcher to the latest version of Synergy 100 MD software prior to installing a new board into the frame.

Refer to the section "**Software Upgrade**" on page 6-10 for information on upgrading your switcher.

Installing the Squeeze & Tease DSP Card

Use the following procedure to install the **Squeeze & Tease DSP Card** onto the **Squeeze & Tease Carrier Board**:

| ⚠ | **Caution** | Always remember to ground yourself by wearing a grounded wrist strap before handling any electronic components. |

1. Place the **Squeeze & Tease Carrier Board** on a clean, static-free surface.
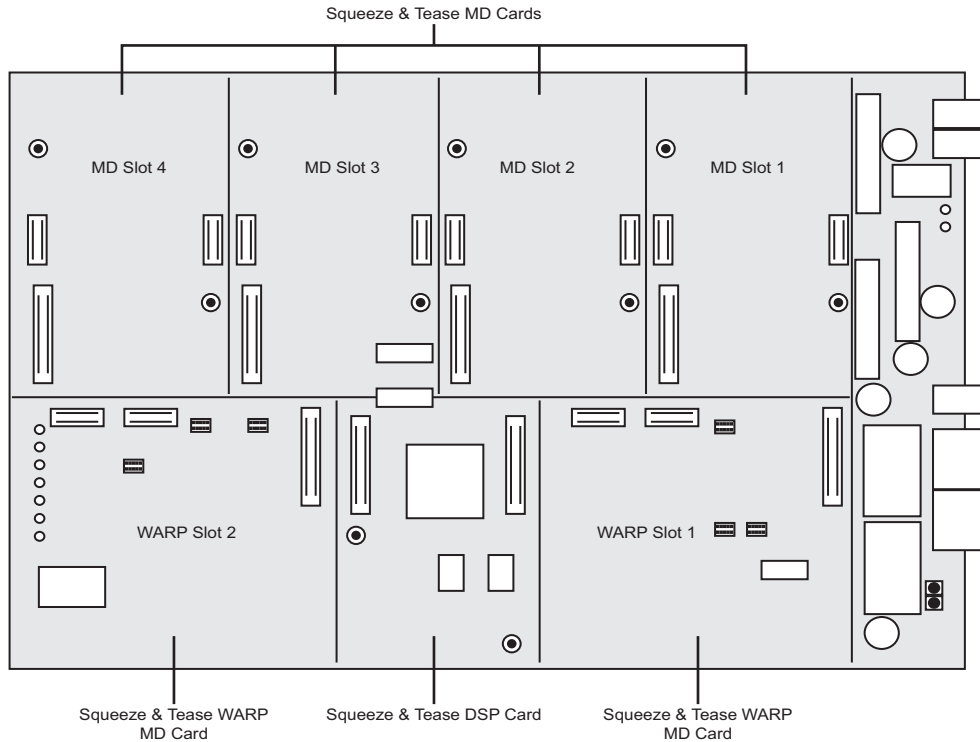
Squeeze & Tease MD Cards

MD Slot 4   MD Slot 3   MD Slot 2   MD Slot 1

WARP Slot 2   WARP Slot 1

Squeeze & Tease WARP   Squeeze & Tease DSP Card   Squeeze & Tease WARP
MD Card   MD Card

Squeeze & Tease Carrier Board — Daughter Card Slots

2. Locate the **Squeeze & Tease DSP Card Slot** on the **Squeeze & Tease Carrier Board**.

3. Orient the **Squeeze & Tease DSP Card** so that the **2** connectors on the bottom of the card line up with the connectors in the **Squeeze & Tease DSP Card Slot**.

✓	**Operating Tip**	The **Retaining Screw Holes** on either side of the card will line up with the mounts on the board.

Retaining Screw Hole ⟶

⟵ Retaining Screw Hole
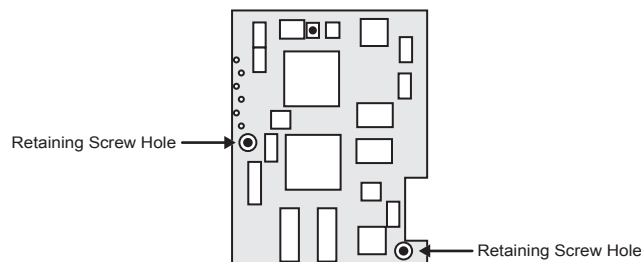
Squeeze & Tease DSP Card

⚠	**Caution**	Do not attempt to use the **Retaining Screws** to seat the card in the slot.

4. Apply firm, even, pressure to seat the card in the Slot.

⚠	**Caution**	Do not overtighten the **Retaining Screws**. These screws only need to be snug in order to secure the card in place.

5. Install the **2 Retaining Screws** into the **Retaining Screw Mounts** on the **Squeeze & Tease Carrier Board** to secure the card in position. The screws insert from the bottom of the Squeeze & Tease Carrier Board, into the daughter card.

This completes the procedure for installing the Squeeze & Tease DSP Card. Next, install any Squeeze & Tease MD Cards onto the Squeeze & Tease Carrier Board.

Installing a Squeeze & Tease MD Card

Use the following procedure to install a Squeeze & Tease MD Card onto the Squeeze & Tease Carrier Board:

	Notice	Always remember to ground yourself by wearing a grounded wrist strap before handling any electronic components.

	Note	Although the **Squeeze & Tease Carrier Board** has slots for **4 Squeeze & Tease MD Cards**, the Synergy 100 MD switcher can only support **2**.

1. Place the **Squeeze & Tease Carrier Board** on a clean, static-free surface.
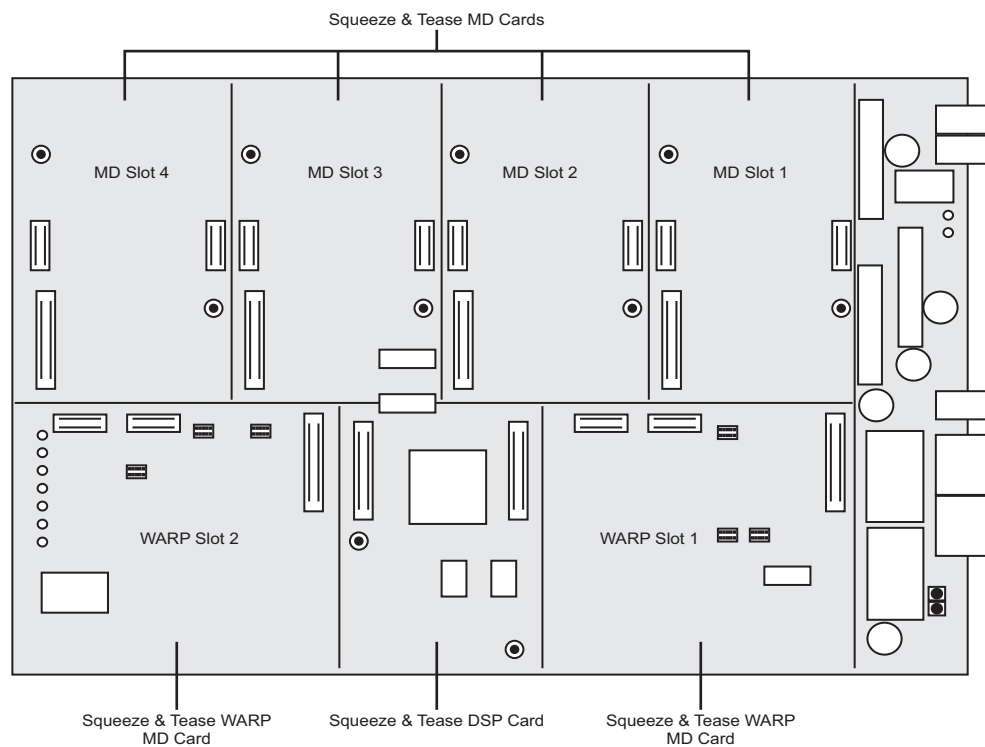
Squeeze & Tease Carrier Board — Daughter Card Slots

2. Locate the **Squeeze & Tease MD Card Slot** (MD Slots **1** through **4**) on the **Squeeze & Tease Carrier Board** that you want to install the **Squeeze & Tease MD Card** into.

	Note	The Synergy 100 MD can only support **2** of the **Squeeze & Tease MD Cards**. These cards should be installed in **Slot 1** and **Slot 2**.

3. Orient the **Squeeze & Tease MD Card** so that the **3** connectors on the bottom of the card line up with the connectors in the **Squeeze & Tease MD Card Slot**.

✓	**Operating Tip**	The **Retaining Screw Holes** on either side of the card will line up with the mounts on the board.
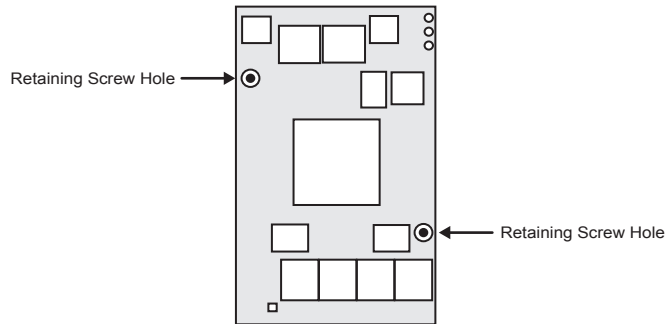
Squeeze & Tease MD Card

⚠	**Caution**	Do not attempt to use the **Retaining Screws** to seat the card in the slot.

4. Apply firm, even, pressure to seat the card in the Slot.

⚠	**Caution**	Do not overtighten the **Retaining Screws**. These screws only need to be snug in order to secure the card in place.

5. Install the **2 Retaining Screws** into the **Retaining Screw Mounts** on the **Squeeze & Tease Carrier Board** to secure the card in position. The screws insert from the bottom of the Squeeze & Tease Carrier, into the daughter card.

This completes the procedure for installing the **Squeeze & Tease MD Card**. Use this same procedure to install any additional **Squeeze & Tease MD Cards**. Next, install any **Squeeze & Tease WARP MD Cards** or install the **Squeeze & Tease Carrier Board** into the frame.

Installing a Squeeze & Tease MD WARP Card

This section provides instructions for installing the **Squeeze & Tease MD WARP Card** option on the **Squeeze & Tease Carrier Board**.

	ESD Susceptibility	**Static discharge** can cause serious damage to sensitive semiconductor devices. Avoid handling the **Squeeze & Tease MD WARP Card** in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Touch the rack frame to dissipate static charge before removing boards from the frame and exercise proper grounding precautions when working on the **Squeeze & Tease MD WARP Card**. Always remember to ground yourself by wearing a grounded wrist strap before handling any electronic components.

Installing a Squeeze & Tease MD WARP Card

Use the following procedure to install the **Squeeze & Tease MD WARP Card** option:

1. Place the **Squeeze & Tease Carrier Board** on a clean, static-free surface.
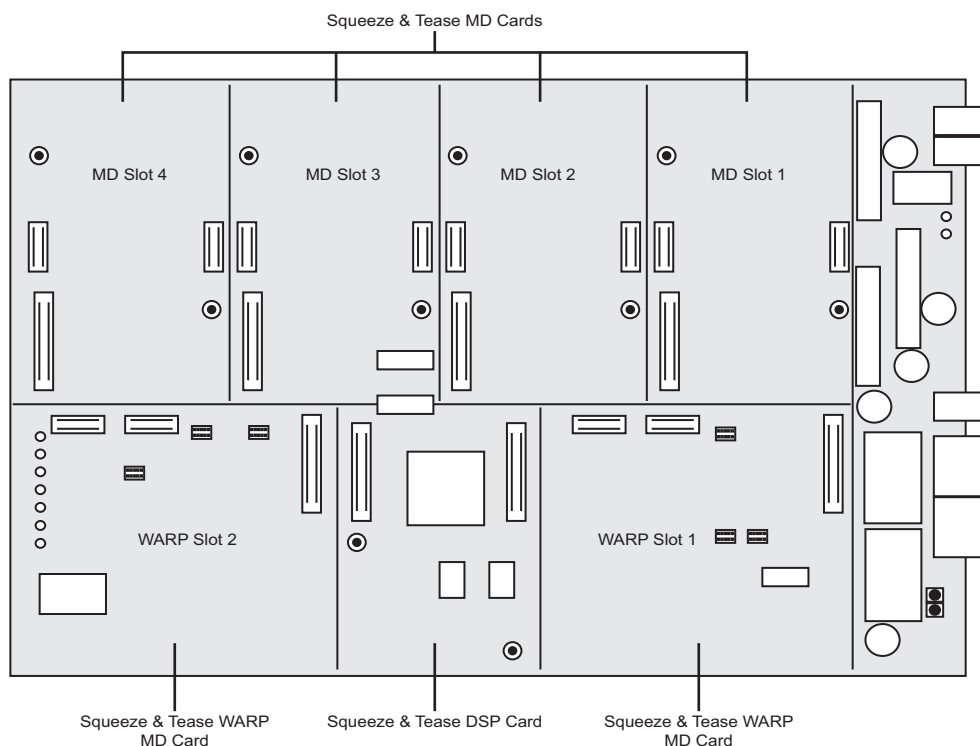
Squeeze & Tease Carrier Board — Daughter Card Slots

2. Locate the **Squeeze & Tease MD WARP Card Slot** (WARP Slots **1** and **2**) on the **Squeeze & Tease Carrier Board** that you want to install the Squeeze & Tease MD WARP Card into.

	Note	The Synergy 100 MD can only support **1** of the **Squeeze & Tease MD WARP Cards**. This card should be installed in **WARP Slot 1**.

3. Orient the **Squeeze & Tease MD WARP Card** so that the **3** connectors on the bottom of the card line up with the connectors in the **Squeeze & Tease MD WARP Card Slot**.

✓	**Operating Tip**	The **Retaining Screw Holes** on either side of the card will line up with the mounts on the board.

Retaining Screw Hole

Retaining Screw Hole

Squeeze & Tease WARP MD Card

⚠	**Caution**	Do not attempt to use the **Retaining Screws** to seat the card in the slot.

4. Apply firm, even, pressure to seat the card in the Slot.

⚠	**Caution**	Do not overtighten the **Retaining Screws**. These screws only need to be snug in order to secure the card in place.

5. Install the **2 Retaining Screws** into the **Retaining Screw Mounts** on the **Squeeze & Tease Carrier Board** to secure the card in position. The screws insert from the bottom of the Squeeze & Tease Carrier, into the daughter card.

This completes the installation for the **Squeeze & Tease MD WARP Card** option.

Installing the Squeeze & Tease Carrier Board into the Frame

When you install the **Squeeze & Tease Carrier Board** into the frame, the switcher will detect the new board and attempt to upgrade it. Once the **Squeeze & Tease Carrier Board** has been upgraded, the **DSP card** on the **Squeeze & Tease Carrier Board** will be upgraded. The **DSP Card** will then upgrade the **Squeeze & Tease MD** and **WARP Cards** as needed. To check the progress of this upgrade you can use the **System Info Page** on the Synergy MD/X Web Interface. Refer to the section "**Software Upgrade**" on page 6-10 for information on viewing the status of an upgrade and how to perform a hard restart of the switcher to initialize the new software.

✳	**Important**	Do not shutdown or restart the switcher, or remove the board from the switcher, while the **Squeeze & Tease Carrier Board** or **DSP Card** is being upgraded. You should wait at least **10** minutes after installing the board before performing any of these actions.

Refer to the section "**Installing Front Frame Circuit Boards**" on page 3-17 for information on installing the Squeeze & Tease MD Carrier Board into the frame.

Appendix A. Specifications

In this Appendix

This appendix provides technical specifications and connector pinout diagrams. In addition, a comprehensive table is provided that lists all normal, GPI, and special diagnostic Aux panel programming modes.

The following sections are provided:

- Standard Components
- Physical Characteristics
- Video Characteristics
- Frame Pinouts
- Control Panel Pinouts
- Remote Aux Panel Pinouts

Note
All specifications are subject to change without notice.

Standard Components

The following components are standard:

- Complete Control Panel
- 1 Chroma Key
- 2 Pattern Generators
- Wipes
- 10 Timed Aux Buses
- System Control Area
- 100 Event Memory System
- 10 GPI Inputs and 10 GPI Outputs
- 16 Tally Outputs
- 10 Meter (33 feet) Control Cable
- System Manuals
- 3 Year Transferable Warranty

Physical Characteristics

General Specifications

Parameter	Specification
MLE Systems	1
Serial Digital Inputs	16
Crosspoint Buttons	10
Serial Digital Outputs	16
Matte Generators	5

Control Panel Specifications

Parameter	Specification
Width	16.95" (43.05 cm)
Height	4.33" (11.00 cm)
Depth	15.35" (38.99 cm)
Height above desktop	1.94" (4.93 cm)
Desk cutout width	16.00" (40.64 cm)
Desk cutout depth	13.25" (33.66 cm)

Rack Frame

Parameter	Specification
# Rack Units (RU)	3
Width	19.00" (48.30 cm)
Height	5.25" (13.34 cm)
Depth	25.00" (63.50 cm)

Rack Frame Connector Types

Parameter	Specification
Video	BNC Type (Female)
Reference	BNC Type (Female)
Peripheral Ports	DB9 (Female)
GPI I/O	DB25 (Female)
Panel Port (to control panel)	RJ-45 (Female)
10/100 Ethernet Port	RJ-45 (Female)
USB Ports	USB 1.1 Compatible, Type A (host)
AC Power (primary, redundant)	3-Pin IEC

Control Panel Connector Types

Parameter	Specification
USB Port (USB Drive)	USB 2.0 Compatible, Type A
Frame Port (to rack frame)	RJ-45 (Female)
Tally Ports	12-pin detachable terminal block
DC power	12VDC, 2 Amp power jack

The balance of the panel connectors are not implemented.

Important | The cable for connecting the Synergy Control Panel to the Synergy Frame is *not* wired as a standard CAT5 ethernet cable. If you need a cable of a specific length, contact your Ross Video Representative for ordering information.

Power Consumption - Control Panel

Parameter	Specification
Input voltage	90V~250 VAC, 47~63 Hz
Control panel	maximum 27 VA

Power Consumption - Rack Frame

Parameter	Specification
Input voltage	100-120V~
	220-240V~
	47-63 Hz
	9A 650W
	(Canada 120V~ only)
Frame (base system)	~ 150W
Frame (loaded system)	~ 500W

Power Rating - Tallies

Parameter	Specification
Input voltage	24V AC (rms) / 40V DC
Maximum current	170mA
Impedance	<15 ohms

Environmental

Parameter	Specification
Panel and rack frame separation	1000 ft (305m) max.
Ambient temperature range	0 - 40 degrees C

• The boards, cards and power supplies in the MD frame are cooled by fans using a side-to-side airflow.

• The control panel is convection cooled (no fans) for silent operation.

⚠ **Caution** | Ensure that you leave space around the frame for adequate ventilation. Both sides of the frame must be kept clear so that switcher airflow is not restricted in any way. Failure to provide adequate ventilation could result in overheating and damage to your switcher may occur.

Video Characteristics

Video Processing

- 10 bit 4:2:2 Component Digital Video and Key Processing.

- 4:3 and Anamorphic 16:9 switchable aspect ratio where applicable.

- The Synergy 100 MD switcher can operate in the following Video Formats:

  - 480i (SD 525)
  - 576i (SD 625)
  - 720p 50 Hz
  - 720p 59.94 Hz
  - 1080p 24 Hz

  - 1080i 59.94 Hz
  - 1080i 50 Hz
  - 1080pSF 24 Hz
  - 1080pSF 23.98 Hz

Video Formats

The Synergy 100 MD switcher can use the following Input Reference formats:

Compatible Video Formats

Input Reference	Usable Formats
480i	• 480i • 480i/16:9 • 1080i 59.94 Hz
576i	• 576i • 576i/16:9 • 1080i 50 Hz
720p 50 Hz	• 720p 50 Hz
720p 59.94 Hz	• 720p 59.94 Hz
1080p 24 Hz	• 1080p 24 Hz
1080i 59.94 Hz	• 480i • 480i/16:9 • 720p 59.94 Hz • 1080i 59.94 Hz
1080i 50 Hz	• 576i • 576i/16:9 • 720p 50 Hz • 1080i 50 Hz
1080pSF 24 Hz	• 1080pSF 24 Hz
1080pSF 23.98 Hz	• 1080pSF 23.98 Hz

System Timing

- All video inputs are zero-time relative to reference input. Auto timing corrects for inputs out of sync by up to ± ¼ line (16us).

LTC Timecode Input

Parameter	Specification
Signal Level	0.5 - 2.0 V (1.0 V nominal)
Termination	600 ohm, soft-selectable

Video Inputs

Parameter	Specification
Video Inputs	16
Equalization (using Belden 1694 cable)	>75m @ 1.5Gb/s >150m @ 270 Mb/s
Impedance	75 ohm, terminating
Return loss	>20 dB @ 1.5GHz

- All Video Inputs are SMPTE-259M/292M serial digital non-looping.

- Inputs can be used for either Key or Video.

- The Reference Input is a non-terminating, looping, input that is selectable as analog black for Standard Definition operation, or tri-level sync for High Definition operation.

Video Outputs

Output Type	Quantity
Main Program (PGM)	1
Preview Matrix (no overlay)	1
Preview Matrix (overlay)	1
MLE 1 PGM (BKGD)	1
MLE 1 PV (PST)	1
MLE 1 Look Ahead Preview	1
MLE 1 Clean Feed	1
DVE Send	1
DVE Send Alpha	1
Aux Bus	10
Maximum Output BNCs	**16**

- All video types can be assigned to any of the Output BNCs, with the exception of those outputs generated by the MultiDSK options.

Output Characteristics

Parameter	Specification
Return loss	>18 dB @ 1.5GHz
Output Jitter	<130 ps
Rise and fall time	800 ps +/- 10% (SD)
	240 ps +/- 10% (HD)
Signal level	800 mV +/- 10%
DC offset	0 volts
Overshoot	<8%

- All video outputs are 10-bit SMPTE 259M-C (SD Mode) or 10-bit SMPTE-292M (HD Mode) serial digital.

- EDH is inserted into all MLE outputs and can be disabled. Aux Bus outputs do not have EDH insertion but do pass previously inserted EDH.

Frame Pinouts

This section provides pinouts for the following frame connectors:

- Peripheral Ports
- Panel Port (to frame)
- GPI I/O Port
- LAN Ports
- AC POWER Ports

Peripheral Ports

The table below provides the pinouts for the **PERIPH1** through **PERIPH4** ports at the back of the **CPU Board** in the Synergy 100 MD frame.

- **Connector:** DB9, Female
- **Communications Format:** Software selectable for RS-232 or RS-422
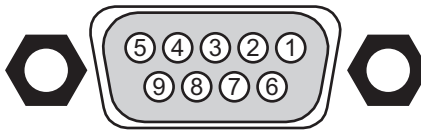
Peripheral Port on Frame

Pinout — Peripheral Ports

Pin #	RS-232	RS-422
1	n/c	Odd/Even Tx+
2	Rx	TxA (Tx-)
3	Tx	RxB (Rx+)
4	Ground	Ground
5	Ground	Ground
6	n/c	Odd/Even Tx–
7	n/c	TxB (Tx+)
8	n/c	RxA (Rx-)
9	n/c	5V 1K Pull-up

Note: n/c = not connected

Panel Port

The table below lists pinouts for the **PANEL** port.

- **Connector:** 8-pin RJ-45, Shielded

• **Communications Format:** RS-422 Data Link to Control Panel
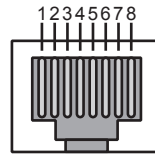
Panel Port on Frame

Pinout — Panel Port

Pin #	Signal
1	TxB (Tx+)
2	TxA (Tx-)
3	RxB (Rx+)
4	RxA (Rx-)
5	ODD/EVEN+ (Transmit)
6	ODD/EVEN- (Transmit)
7	Ground (AC coupled)
8	Ground (AC coupled)

GPI I/O Port

The table below lists pinouts for the **GPI I/O** connector.

• **Connector:** DB25, Female

• **GPI Out 1-10:** Active Drive 5V TTL-compatible signals

• **GPI In 1-10:** 5V TTL-compatible edge or level trigger

• **System Fail:** 2 System Fail and 2 System Fail Return relays: 0 - 24 VDC, contact-closure FET, normally-closed relays.

✎	**Note**	The System Fail relays are not yet implemented.
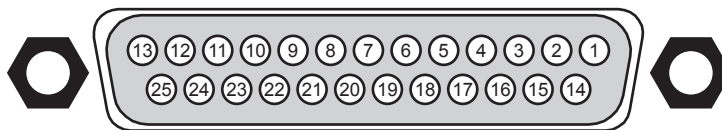
GPI I/O Port on Frame

Pinouts — GPI I/O Port

Pin #	Signal
1	Ground
2	System Fail 1
3	System Fail 0

Pinouts — GPI I/O Port

Pin #	Signal
4	GPI In 10
5	GPI In 9
6	GPI In 8
7	GPI In 7
8	GPI In 6
9	GPI In 5
10	GPI In 4
11	GPI In 3
12	GPI In 2
13	GPI In 1
14	System Fail Return 1
15	System Fail Return 0
16	GPI Out 10
17	GPI Out 9
18	GPI Out 8
19	GPI Out 7
20	GPI Out 6
21	GPI Out 5
22	GPI Out 4
23	GPI Out 3
24	GPI Out 2
25	GPI Out 1

LAN Ports

The table below lists pinouts for the **LAN 10/100** ports.

- **Connector:** 8-pin RJ-45, Shielded
- **Communications Format:** 10Base-T and 100Base-TX Ethernet
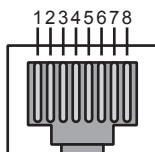
LAN Port on Frame

Pinout — LAN (Ethernet) Port

Pin #	Signal
1	Tx+
2	Tx-
3	Rx+
4	n/c
5	n/c
6	Rx-
7	n/c
8	n/c

AC POWER Ports

The table below lists pinouts for the **AC POWER** connectors.

- **Connector:** 3-Pin IEC Male
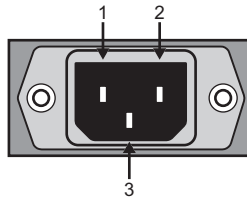
AC Power Port on Frame

Pinout — AC Power Port

Pin #	Signal
1	Neutral/Line 2
2	Line
3	Ground

Control Panel Pinouts

This section provides pinouts for the following control panel connectors:

- Frame Port
- Tally Ports
- AC Power Ports

Frame Port

The table below lists pinouts for the **FRAME** port.

- **Connector:** 8-pin RJ-45, Shielded
- **Communications Format:** RS-422 Data Link to Frame
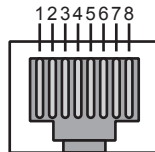
Frame Port on Control Panel

Pinout — Frame Port

Pin #	Signal
1	RxB (Rx+)
2	RxA (Rx-)
3	TxB (Tx+)
4	TxA (Tx-)
5	ODD/EVEN+ (Receive)
6	ODD/EVEN- (Receive)
7	Ground (AC coupled)
8	Ground (AC coupled)

Tally Ports

The following table lists pinouts for the two **TALLY** ports.

- **Connector:** 12-pin detachable terminal block
- **Rating:** Maximum of 10 VA (100 Vmax, 0.5 Amax) into a non-inductive load.

- **Communications Format:** Solid state relay contact closure to TALLY COMMON
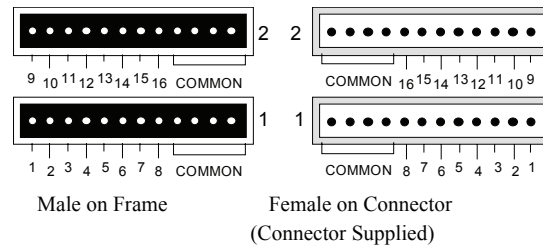
Male on Frame

Female on Connector
(Connector Supplied)

AC Power Ports

The table below lists pinouts for the **AC POWER** connectors.

- **Connector:** 3-Pin IEC Male
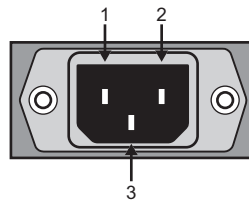
AC Power Port on Control Panel

Pinout — AC Power Port

Pin #	Signal
1	Neutral/Line 2
2	Line
3	Ground

Remote Aux Panel Pinouts

This section provides pinouts for the following Remote Aux Panel ports:

- Remote (ECHO) Port
- Switcher (MAIN) Port

Remote (ECHO) Port

The table below lists pinouts for the **Remote (ECHO)** port on a Remote Aux Panel.

- Connector type: 6-pin RJ-12 Telco Jack, Shielded
- Format: RS-422 Data Link from Remote Aux Panel to Panel
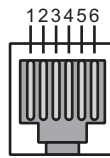
Remote Aux Panel — Remote (ECHO) Connector

Remote Aux Panel — Remote (ECHO) Port Pinouts

Pin #	Function
1	RxA (Rx-)
2	RxB (Rx+)
3	TxA (Tx-)
4	TxB (Tx+)
5	RESET (Out)
6	Ground

Switcher (MAIN) Port

The table below lists pinouts for the **Switcher (MAIN)** port on a Remote Aux Panel.

- Connector type: 6-pin RJ-12 Telco Jack, Shielded
- Format: RS-422 Data Link from Switcher to Remote Aux Panel
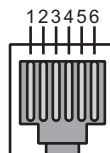
Remote Aux Panel — Switcher (MAIN) Connector

Remote Aux Panel — Switcher (MAIN) Port Pinouts

Pin #	Function
1	TxA (Tx-)
2	TxB (Tx+)
3	RxA (Rx-)
4	RxB (Rx+)
5	RESET (In)
6	Ground

Appendix B. Peripheral Device Specifics

In This Appendix

This appendix provides connector pinout information for peripheral devices supported by the Synergy 100 MD switcher.

The following topic is discussed:

- Audio Mixer Interface Specifics

Audio Mixer Interface Specifics

This section provides information specific to each audio mixer supported.

Yamaha 01V96

In order to allow the Synergy 100 MD switcher to communicate with the audio mixer, you must configure it as described in this section.

✎ **Note**	For information on the Function Buttons and navigating the menu system on your Remote Audio Mixer, refer to the documentation that came with your Audio Mixer.

Use the following procedure to setup your Yamaha 01V96 Audio Mixer:

1. Press the **DIO/SETUP** function button in the **Display Access Group** to display the **DIO/SETUP Menu**.

2. Press the **MIDI/HOST** tab to display the **MIDI I/O HOST SETUP Menu**.

3. Use the **Cursor** buttons to navigate to the following (you will have to press **ENTER** after each selection):

   • **Tx PORT** — Use the Parameter Dial to set this to **MIDI**.

   • **Rx PORT** — Use the Parameter Dial to set this to **MIDI**.

4. Press the **MIDI** function button in the **Display Access Group** to display the **MIDI Menu**.

5. Press the **SETUP** tab to display the **MIDI SETUP Menu**.

6. Use the **Cursor** buttons to navigate to the following (you will have to press **ENTER** after each selection):

   • **Tx CH** — Use the Parameter Dial to set this to **1**.

   • **Rx CH** — Use the Parameter Dial to set this to **1**.

   • Use the following table to set the indicated parameters.

Yamaha 01V96 Setup

	Tx	Rx	OMNI	ECHO
Program Change	ON	ON	OFF	OFF
Control Change	ON	ON	OFF	--
Param Change	ON	ON	--	OFF
Bulk	--	OFF	--	--
Other Commands	--	--	--	OFF

   • **Fader Resolution** — Use the Parameter Dial to set this to **LOW**.

This completes the procedure for setting up the remote audio mixer to communicate with the Synergy 100 MD switcher.

MIDIator Interface Cable Specifications

The serial cable that connects the MIDIator to the Peripheral Port on the Synergy 100 MD frame has the following pinouts.

Synergy-to-MIDIator MS-124 Converter Wiring Chart

Synergy 100 MD			MIDIator MS-124 Converter	
Peripheral Port	Signal		Cable Adapter	Signal
1	n/c			n/c
2	Tx	→	3	Rx
3	Rx	→	2	Tx
4	n/c			n/c
5	Ground	→	5	Ground
6	n/c			n/c
7	n/c			n/c
8	n/c			n/c
9	n/c			n/c

Graham-Patten D/ESAM-8000

In order to allow the Synergy 100 MD switcher to communicate with the Audio Mixer, you must configure it as follows:.

Note For information on navigating the menu system on your Audio Mixer, refer to your Audio Mixer documentation.

- If the Synergy Peripheral Port is configured as **Channel**, by toggling the **9. Audio Unit** menu option, in the Synergy **Communication Menu**:
  ~ set the faders 1-8 on the D/ESAM-8000 to the 8 inputs of the Logic Machine you assigned to **Machine1** when configuring communications settings.
  ~ set faders 9-16 on the D/ESAM-8000 to the 8 inputs of the Logic Machine you assigned to **Machine2** when configuring communications settings.
- Manually set each fader to the desired level. The Synergy 100 MD switcher cannot control multi-fader levels for input channels directly, and will open and close the input channel at one level.
- If the Synergy Peripheral Port is configured as **LogicMachine**, by toggling the **9. Audio Unit** menu option, in the Synergy **Communication Menu**:
  ~ the Machine Name replaces the Channel and Group labels in the Synergy **Input Menu**.
  ~ when a BNC signal is taken on or off air, the associated Logic Machine and all of its channels is also taken on or off air.

Graham-Patten D/ESAM-8000 Cabling

The serial cable that connects the Graham-Patten D/ESAM-8000 Remote Audio Mixer to the Peripheral Port on the Synergy 100 MD frame has the following pinouts.

Synergy 100 MD -to- Graham-Patten D/ESAM-8000 Wiring Chart

Synergy Frame			Graham-Patten D/ESAM-8000	
Peripheral Port	Signal		CPU Controller Edit Port	Signal
1	n/c		1	Frame Ground
2	TxA (Tx-)	→	8	RxA (Rx-)
3	RxB (Rx+)	→	7	TxB (Tx+)
4	Ground	→	4	Transmit Common
5	Ground	→	6	Receive Common
6	n/c		5	Spare
7	TxB (Tx+)	→	3	RxB (Rx+)
8	RxA (Rx-)	→	2	TxA (Tx-)
9	n/c		9	Frame Ground

Appendix C. Installation Worksheets

In This Appendix

This appendix provides worksheet tables to help plan and record switcher installation settings and wring connections. The following worksheets are included:

- Input Worksheet
- Output Worksheet
- Remote Control Worksheet
- Standard GPI Input Worksheet

Input Worksheet

✎ **Note** | Push-button inserts may be downloaded from the Ross Video website at http://www.rossvideo.com, and printed at your facility.

Make copies of this blank worksheet for use as required. Complete the following worksheet for all of your video inputs, including primary sources, keys and fills.

Input BNC Worksheet

BNC #	Actual Source	Remote Port	Device Address	Input Name	Input Type	Tally Number	Alpha Type	Auto Key	Audio Channel
Sample 1	CG Alpha	Remote 2		CG Alpha	Alpha	—	Shaped	C10	—
C01									
C02									
C03									
C04									
C05									
C06									
C07									
C08									
C09									
C10									
C11									
C12									
C13									
C14									
C15									
C16									

Refer to the section "**Input Connection**" on page 4-13 for more details.

Output Worksheet

Make copies of the following blank worksheet for use as required.

BNC Output Worksheet

BNC Output Connector #		Output Type	Destination
e.g. 1	*B01*	Program	Master Control
e.g. 2	*B13*	AuxBus 1	Monitor 6
	B01		
	B02		
	B03		
	B04		
	B05		
	B06		
	B07		
	B08		
	B09		
	B10		
	B11		
	B12		
	B13		
	B14		
	B15		
	B16		

Refer to the section "**Connecting and Verifying Outputs**" on page 8-7 for more details.

Remote Control Worksheet

Using the figure below for reference, complete the following remote control worksheet. Copy the worksheet as required. Fill in the serial controlled device and the remote control port (on the device) that is used for serial control.

The figure below illustrates the location of the four peripheral on the rear of the Synergy MD frame.
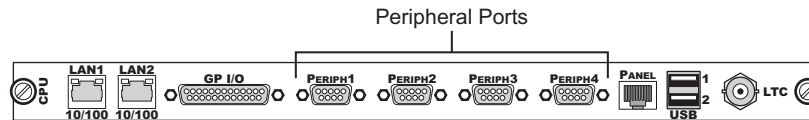
Synergy MD Frame — Peripheral Ports

Remote Control Worksheet

Remote Connector	Serial Controlled Device	Device Serial Port
PERIPH 1		
PERIPH 2		
PERIPH 3		
PERIPH 4		

Refer to the section "**Output Worksheet**" on page 8-3 for more information.

Standard GPI Input Worksheet

Make copies of this blank worksheet for use as required. Complete the following Standard GPI Input worksheet.

Standard GPI Input Worksheet

Standard GPI Input #	Event Type	Event Area	Polarity
Sample GPI Input #1	Auto	MLE	Low
Sample GPI Input #2	Cut	Fade to black	High
Sample GPI Input #3	Recall Mem	Memory08	High
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Refer to the section "**Programming Standard GPI Inputs**" on page 11-5 for more information.

Appendix D. IP and Web Issues

In This Appendix

This appendix provides information on standard network security practices with consideration to ethernet connections.

The following topics are discussed:

- Standard Network Security

- Understanding IP Addresses

- Software Licenses

Standard Network Security

Upgrades can be uploaded to the Synergy 100 MD switcher from a computer using an **Ethernet** port on the back of the Synergy MD frame. Images and animations can be copied from a computer to the switcher's internal hard drive for use by the Global-Store and MediaCache. The Ethernet port can also be used to transfer images and animations from the hard drive on the switcher to a computer. This allows image captures on the switcher to be used elsewhere in the studio. Refer to the section "**Network Setup**" on page 6-2 for set up information. Contact your company's Network Administrator for information on your ethernet network.

	Note	The Ethernet port is required for upgrades and *not* for switcher operation.

Ethernet Connection Precautions

	Important	It is recommended that you unplug your ethernet cable when not in use; being connected on a network carries security risks that could impact the performance of the switcher. Contact your Network Administrator for more information.

If the Synergy MD frame is to be left connected to the ethernet, the following precautions should be taken:

- **Do not connect directly to the Internet** — Anyone who can access your network will also gain access to sensitive data and equipment. Limit network access by using a firewall, or a separate network segment, to control who can access your switcher. Contact your company's Network Administrator for more information.

- **Change the default passwords** — The Synergy MD frame is initially set with default passwords. To change your default passwords, contact **Ross Video Technical Support**.

- **Disable unused services** — The Synergy MD frame provides access to three default services provided by Ross Video: web server, FTP server, and the Telnet server. Contact **Ross Video Technical Support** for information on how these services can be disabled individually or keep your network unplugged.

	Note	It is not recommended to install or enable services that are not provided by Ross Video.

Understanding IP Addresses

Internet Protocol (IP) Address parameters must be assigned to configure the Synergy MD frame for network operations. The values must be chosen so as not to conflict with other devices on the network. Your Network Administrator should provide these values. Once configured, the Synergy MD frame can be accessed using its IP Address.

IP Addresses

Internet Protocol (IP) Addresses are used to identify devices on a network. This address is used to route messages through the network, back and forth between devices. There are two types of addresses: IPv4 which can take on the form of 32 bits, or 4 numbers separated by periods (for example, 192.168.1.1) or IPv6 with 128 bits. The Synergy MD frame supports IPv4 Addresses.

There are two configuration methods for IP Addresses supported by the Synergy MD frame:

- **Static** — Static IP Addresses require you to manually provide the IP Address, the netmask, the domain name server, and the gateway/router addresses.

- **DHCP** — Dynamic Host Configuration Protocol (DHCP) IP Addresses are obtained automatically from your network each time the Synergy MD frame connects to the network.

Refer to the section "**Network Setup**" on page 6-2 for more information.

Default Services

Note | The addresses provided in this section are examples only. Refer to the section "**Network Setup**" on page 6-2 and Chapter 11 in the *Synergy 100 MD Operator's Manual* or contact Ross Video Technical Support for more information.

Ross Video provides three default services for the Synergy MD frame which can be accessed with the following addresses:

- **Web server** — The web server is used for upgrades and setup. The URL Address is **http://192.168.1.1**, using port 80. Refer to the section "**Network Setup**" on page 6-2 for more information.

- **Telnet server** — The Telnet server is used for diagnostic and maintenance purposes. You must first manually launch the Telnet application, and then connect at **telnet://192.168.1.1**. Refer to the section "**Control Panel Diagnostic Mode**" on page 12-6 for more information.

Note | The Telnet server should be disabled when not in use.

Software Licenses

Synergy MD includes software licensed under one or more of the following licenses:

- GNU General Public License

- Lesser GNU Public License (LPGL)

- BSD license

- Apache license

- Expat license

⚠ **Important**

As per the GNU General Public License and the Lesser GNU Public License (LPGL), source code can be obtained for at least 3 years from Ross Video. Please contact **Ross Video Technical Support** for details; contact information is listed at the front of this manual.

GNU General Public License

GNU GENERAL PUBLIC LICENSE

Version 2, June 1991

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Glossary of Terms

Active Video Lines — All video lines not occurring in the vertical blanking interval. The portion of the video signal that contains picture information.

Aspect Ratio — The numerical ratio of picture width to height, for example, 4:3 or 16:9.

Auto Transition — An automatic transition in which the manual movement of the fader handle is simulated electronically. The transition starts when the **AUTO TRANS** button is pressed and takes place over a pre-selected time period, measured in frames.

Border — Effects created around the edges of a pattern or on a keyer. If an optional dual border generator card is installed, several border, shadow, and outline effects are available on that keyer as well.

Border Generator — Circuitry that generates various border effects on keys created by the switcher.

Chroma Key — An effect in which video from one source replaces video of a specific hue in a second video source. The blue and green hues are most commonly used for chroma keying.

Chrominance — The "depth" or saturation of a color. The three characteristics of a TV color signal are chrominance, luminance and hue.

Cut — An instantaneous switch from one video signal to another.

Dissolve — A transition from one video signal to another in which one signal is faded down while the other is simultaneously faded up. The term "mix" is often used interchangeably with "dissolve".

Downstream Keyer (DSK) — A keyer that places a key "downstream" of the MLE effects system output. This "top level" effect usually consists of a character generator title.

External Key — A video input (non-primary video) used to produce a key effect. Examples of external key sources are character generators and cameras.

Fade-to-Black — A controlled change of the on-air picture signal level down to black level.

Field — One half of a complete picture (or frame) interval containing all of the odd, or all of the even lines in interlaced scanning. One scan of a TV screen is called a "field"; two fields are required to make a complete picture (which is a "frame").

Field Frequency — The rate at which one complete field is scanned, approximately 50 times per second in 625 video, or 60 times per second in 525 video.

Frame — One complete picture consisting of two fields of interlaced scanning lines.

GPI — An abbreviation for General Purpose Interface, a device which typically allows remote control of the switcher's automatic transition functions.

Hue — The characteristic of a color signal that determines whether the color is red, yellow, green, blue, purple, etc. (the three characteristics of a TV color signal are chrominance, luminance, and hue). White, black, and gray are not considered hues.

Internal Key — The use of a primary input to produce a key effect.

Key — An effect produced by "cutting a hole" in background video, then filling the hole with video or matte from another source. Key source video cuts the hole, key fill video fills the hole. The video signal used for cut and fill can come from the same or separate sources.

Key Fill — A video input which is timed to "fill the hole" provided by the key source video. An example of key fill is the video output of a character generator.

Key Invert — An effect that reverses the polarity of the key source so that the holes in the background are cut by dark areas of the key source instead of bright areas. The **KEY INV** push-button selects this effect.

Key Mask — A keying technique in which a pattern is combined with the key source to block out unwanted portions of the key source.

Key Source — The video signal which "cuts a hole" in the background video to make a key effect possible. Also called "Key Video". In practice, this signal controls when a video mixer circuit will switch from background to key fill video.

Key Video — See Key Source.

Linear Keys — Linear keys make it possible to fully specify the transparency of a key from opaque, through transparent, to fully off. The transparency is specified by the key signal (also known as the "hole cutter" or "alpha channel") that is associated with the key fill. A keyer capable of a linear key converts the key signal voltage directly to the transparency effect on the screen. Our switcher's **KEY MEM** button allows the user to store the CLIP and GAIN settings required to match the incoming key signal to the keyer's requirements.

Line Frequency — The number of horizontal scans per second. For 525 line 60 Hz systems, this is approximately 15734 scans per second.

Luminance Key — An effect in which video from one source is replaced by video that exceeds a set level in a second video source.

Mask — See Key Mask.

Matte — A solid color signal that is generated by the switcher and can be adjusted for hue, saturation, and luminance levels.

Matte Key — A key effect in which the fill video is matte, provided by one of the switcher's matte generators.

Memory — The memory feature provides storage and recall of complete switcher setups.

MIX — See Dissolve.

MLE — An abbreviation for multi-level effects.

PGM Output — The on-air video output of the system.

Primary Input — Video sources selected by the control panel push-buttons for the crosspoint buses. These buses are normally labeled "KEY", "PGM", and "PST".

PV Output — A switcher output that shows the scene that will go on-air when the next automatic or manual transition takes place.

Self Key — A key effect in which the same video signal serves as both the key signal and key fill.

Soft Edge — A pattern edge effect produced by mixing key source and key fill signals in such a way that the edge of the pattern is not sharp.

Split Screen — An effect in which a wipe pattern provides the key source signal. This is known as a "preset pattern" key.

Tally — An indicator which illuminates when the associated push-button or control is selected or is on-air.

Termination — A means of closing a circuit by connecting a resistive load to it. In video systems, a termination is typically a 75 ohm resistive load.

Transition — A controlled change from one video input to another video input or black. The change can occur through a wipe, cut, dissolve or "DVE Send" effect.

Transition Preview — A transition seen only on the preview monitor. It may be observed and adjusted without disturbing the program or "on-air" output.

Video — The electrical signal produced by a television camera, character generator or other image source. The signal amplitude varies in relation to the tonal scale from black to white presented at the source. White produces the highest amplitude; black produces the lowest signal amplitude.

Wipe — A transition from one video signal to another, in which the change proceeds according to the shape of a specific pattern. A moving transition line separates the two picture signals.

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