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Kayak HD

DIGITAL PRODUCTION SWITCHER

Installation and Service Manual

SOFTWARE VERSION 6.9.2

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Grass Valley Web Site

The www.thomsongrassvalley.com web site offers the following:

Online User Documentation — Current versions of product catalogs, brochures, data sheets, ordering guides, planning guides, manuals, and release notes in .pdf format can be downloaded.

FAQ Database — Solutions to problems and troubleshooting efforts can be found by searching our Frequently Asked Questions (FAQ) database.

Software Downloads — Download software updates, drivers, and patches.

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END-OF-LIFE PRODUCT RECYCLING NOTICE

Grass Valley's innovation and excellence in product design also extends to the programs we've established to manage the recycling of our products. Grass Valley has developed a comprehensive end-of-life product take back program for recycle or disposal of end-of-life products. Our program meets the requirements of the European Union's WEEE Directive, the United States Environmental Protection Agency, and U.S. state and local agencies.

Grass Valley's end-of-life product take back program assures proper disposal by use of Best Available Technology. This program accepts any Grass Valley branded equipment. Upon request, a Certificate of Recycling or a Certificate of Destruction, depending on the ultimate disposition of the product, can be sent to the requester.

Grass Valley will be responsible for all costs associated with recycling and disposal, including freight. However, you are responsible for the removal of the equipment from your facility and packing the equipment to make it ready for pickup.

For further information on the Grass Valley product take back system please contact Grass Valley at + 800 80 80 20 20 or +33 1 48 25 20 20 from most other countries. In the U.S. and Canada please call 800-547-8949 or 530-478-4148, and ask to be connected to the EH&S Department. Additional information concerning the program can be found at: www.thomsongrassvalley.com/environment

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Preface

About This Manual

This Kayak HD Installation and Service Manual provides installation, configuration, and service information for the Grass Valley Kayak HD Digital Production Switcher. This manual is designed for technical personnel responsible for installing and maintaining Kayak HD systems.

Standard Documentation Set

The standard Kayak HD documentation set consists of:

- User Manual
- Installation and Service Manual
- Release Notes

The User Manual contains background information about the Kayak HD Digital Production switcher and describes operating procedures. This manual can be used while learning about Kayak HD and for enhancing your basic knowledge of the system.

The Installation and Service Manual contains information about installing, configuring, and maintaining the system. The service section of this manual is in preparation.

The Release Notes contain information about new features and system enhancements for a specific software version, and also includes software installation procedures. Always check the release notes for your current system software before you begin operating your system.

Other Documentation

Communication protocols of Kayak HD are available upon request for developers and software engineers to use to design editor and other external interfaces to the Kayak HD system.

Regulatory Notices

Certifications and Compliances

FCC Emission Control

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. Changes or modifications not expressly approved by Grass Valley Group can affect emission compliance and could void the user's authority to operate this equipment.

Canadian EMC Notice of Compliance

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'emet pas de bruits radioélectriques dépassant les limites applicables aux appareils numeriques de la classe A préscrites dans le Règlement sur le brouillage radioélectrique édicte par le ministère des Communications du Canada.

EN55022 Class A Warning

For products that comply with Class A. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Canadian Certified Power Cords

Canadian approval includes the products and power cords appropriate for use in the North America power network. All other power cords supplied are approved for the country of use.

Canadian Certified AC Adapter

Canadian approval includes the AC adapters appropriate for use in the North America power network. All other AC adapters supplied are approved for the country of use.

FCC Emission Limits

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may no cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable operation. This device has been tested and found to comply with FCC Part 15 Class B limits for a digital device when tested with a representative laser-based fiber optical system that complies with ANSI X3T11 Fiber Channel Standard.

Certification

This product has been evaluated for Electromagnetic Compatibility under the EN 55103-1/2 standards for Emissions and Immunity and meets the requirements for E1/E2 environment.

This product complies with Class A. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

This product has been evaluated and meets the following Safety Certification Standards:

Category	Standard	Designed/tested for compliance with:
Safety	ANSI / UL60950	"Standard for Safety of Information Technology Equipment - Safety - Part 1: General Requirements", (ANSI/UL 60950-1, First Edition, Dated April 1, 2003, with revision through and including November 26, 2003.)
	IEC 60950	"Standard for Safety for Information Technology Equipment - Safety - Part 1: General Requirements", (IEC 60950-1, First Edition, 2001, Corrigendum 1:10-2002)
	CAN/CSA C22.2, No. 60950	"Standard for Safety of Information Technology Equipment - Safety - Part 1: General Requirements", (CAN/CSA-C22.2 No. 60950-1-03. First Edition Dated April 1, 2003, with revisions through and including November 26, 2003)
	EN60950	Safety of Information Technology Equipment, including Electrical Business Equipment.
	73/23/EEC	Low Voltage Directive

Category	Standard	Designed/tested for compliance with:
EMI	EMC Directive 89/336/EEC via EN 55103-1 and 2	Audio, Video and Entertainment Lighting Control for the European Community.
	EN 55103-1 standards	Electromagnetic compatibility. Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 1 Emissions, Environment E1/E2 EN 55022: Class A Radiated and Conducted Emissions EN 61000-3-2: Power Line Harmonic Emissions, Radiated Magnetic Field Emissions, Peak Inrush Current
	EN55103-2 standards	Electromagnetic compatibility--Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2 Immunity, Environment E1/E2 EN 50082-1: Immunity EN 61000-4-2: Electrostatic Discharge “ESD” Immunity EN 61000-4-3: Radiated RF Electromagnetic Field Immunity EN 61000-4-4: Electrical Fast Transient/Burst “EFT” Immunity EN 61000-4-5: Surge Immunity EN 61000-4-6: Conducted RF Immunity EN 61000-4-11: Voltage Dips, Short Interruptions and Voltage Variations Annex A - Radiated Magnetic Field Immunity Note: This only applies to assemblies sensitive to magnetic fields
	US FCC Class A	CISPR Pub. 22 (1985)
	Canada FCC Industry Canada	
	Australia & New Zealand:	AS/NZS 3548

Safety Summary

Read and follow the important safety information below, noting especially those instructions related to risk of fire, electric shock or injury to persons. Additional specific warnings not listed here may be found throughout the manual.

WARNING Any instructions in this manual that require opening the equipment cover or enclosure 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.

Safety Terms and Symbols

Terms in This Manual

Safety-related statements may appear in this manual in the following form:

WARNING Warning statements identify conditions or practices that may result in personal injury or loss of life.

CAUTION Caution statements identify conditions or practices that may result in damage to equipment or other property, or which may cause equipment crucial to your business environment to become temporarily non-operational.

Terms on the Product

The following terms may appear on the product:

DANGER — A personal injury hazard is immediately accessible as you read the marking.

WARNING — A personal injury hazard exists but is not immediately accessible as you read the marking.

CAUTION — A hazard to property, product, and other equipment is present.

Symbols on the Product

The following symbols may appear on the product:

Indicates that dangerous high voltage is present within the equipment enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

Indicates that user, operator or service technician should refer to product manual(s) for important operating, maintenance, or service instructions.

This is a prompt to note fuse rating when replacing fuse(s). The fuse referenced in the text must be replaced with one having the ratings indicated.

Identifies a protective grounding terminal which must be connected to earth ground prior to making any other equipment connections.

Identifies an external protective grounding terminal which may be connected to earth ground as a supplement to an internal grounding terminal.

Indicates that static sensitive components are present which may be damaged by electrostatic discharge. Use anti-static procedures, equipment and surfaces during servicing.

Warnings

The following warning statements identify conditions or practices that can result in personal injury or loss of life.

Dangerous voltage or current may be present — Disconnect power and remove battery (if applicable) before removing protective panels, soldering, or replacing components.

Double-pole or neutral fusing — Disconnect mains power prior to servicing. After a fuse opens, high voltage in parts of the equipment may still present a hazard to you during servicing.

Do not service alone — Do not internally service this product unless another person capable of rendering first aid and resuscitation is present.

Remove jewelry — Prior to servicing, remove jewelry such as rings, watches, and other metallic objects.

Avoid exposed circuitry — Do not touch exposed connections, components or circuitry when power is present.

Use proper power cord — Use only the power cord supplied or specified for this product.

Ground product — Connect the grounding conductor of the power cord to earth ground.

Operate only with covers and enclosure panels in place — Do not operate this product when covers or enclosure panels are removed.

Use correct fuse — Use only the fuse type and rating specified for this product.

Use only in dry environment — Do not operate in wet or damp conditions.

Use only in non-explosive environment — Do not operate this product in an explosive atmosphere.

High leakage current may be present — Earth connection of product is essential before connecting power.

Dual power supplies may be present — Be certain to plug each power supply cord into a separate branch circuit employing a separate service ground. Disconnect all power supply cords prior to servicing.

Ensure mains disconnect — If mains switch is not provided, the power cord(s) of this equipment provide the means of disconnection. The socket outlet must be installed near the equipment and must be easily accessible. Verify that all mains power is disconnected before installing or removing power supplies and/or options.

Use proper lift points — Do not use door latches to lift or move equipment.

Avoid mechanical hazards — Allow all rotating devices to come to a stop before servicing.

Cautions

The following caution statements identify conditions or practices that can result in damage to equipment or other property

Use correct power source — Do not operate this product from a power source that applies more than the voltage specified for the product.

Use correct voltage setting — If this product lacks auto-ranging power supplies, before applying power ensure that the each power supply is set to match the power source.

Provide proper ventilation — To prevent product overheating, provide equipment ventilation in accordance with installation instructions.

Use anti-static procedures — Static sensitive components are present which may be damaged by electrostatic discharge. Use anti-static procedures, equipment and surfaces during servicing.

Do not operate with suspected equipment failure — If you suspect product damage or equipment failure, have the equipment inspected by qualified service personnel.

Route cable properly — Route power cords and other cables so that they ar not likely to be damaged. Properly support heavy cable bundles to avoid connector damage.

Use correct power supply cords — Power cords for this equipment, if provided, meet all North American electrical codes. Operation of this equipment at voltages exceeding 130 VAC requires power supply cords which comply with NEMA configurations. International power cords, if provided, have the approval of the country of use.

Use correct replacement battery — This product may contain batteries. To reduce the risk of explosion, check polarity and replace only with the same or equivalent type recommended by manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Troubleshoot only to board level — Circuit boards in this product are densely populated with surface mount technology (SMT) components and application specific integrated circuits (ASICS). As a result, circuit board repair at the component level is very difficult in the field, if not impossible. For warranty compliance, do not troubleshoot systems beyond the board level.

Section 1

System Overview

Introduction

The Grass Valley Kayak HD™ digital production switcher is an affordable, compact, and flexible system that offers an array of high-end features for everything from live studio and mobile production to small corporate studios and editing applications. The Kayak HD switcher leverages many of the features found in the Grass Valley KayakDD2™ and Zodiak™ switchers. The result is a compact system with superior image quality and features not found in any other product.

Kayak HD or SD Switcher Models

- Kayak HD or SD 100C, which includes a 1 M/E Control Panel and a compact 4 RU Video Processor Frame
- Kayak HD or SD 150C, which includes a 2 M/E Control Panel and a 4 RU Video Processor frame equipped with one M/E module and the license for a Half M/E
- Kayak HD or SD 200C, which includes a 2 M/E Control Panel and a 4 RU Video Processor frame equipped with two M/E modules
- Kayak HD or SD 200, which includes a 2 M/E Control Panel and a 8 RU Video Processor frame equipped with two M/E modules
- Kayak HD or SD 250C, which includes a 3 M/E Control Panel and a 4 RU Video Processor frame equipped with two M/E modules and the license for a Half M/E
- Kayak HD or SD 250, which includes a 3 M/E Control Panel and an 8 RU Video Processor frame equipped with two M/E modules and the license for a Half M/E
- Kayak HD or SD 300, which includes a 3 M/E Control Panel and an 8 RU Video Processor frame equipped with three M/E modules

Frame-only models are available for the configurations listed above and include the following:

- Kayak HD or SD 350 Frame-only which includes an 8 RU Video Processor frame equipped with three mix/effects and the license for a Half M/E
- Kayak HD or SD 400 Frame-only which includes an 8 RU Video Processor frame equipped with four mix/effects
- Kayak HD or SD 450 Frame-only which includes an 8 RU Video Processor frame equipped with three mix/effects and the license for a Half M/E

Kayak HD Standard Features

- Switchable between several HD formats
- Supports SD production
- Fully digital 10-bit, 4:2:2 inputs, outputs
- Compact 4 RU and 8 RU lightweight frames
- Low power consumption
- Hot swappable, front removable modules and power supplies
- Intuitive menu with touch screen
- One DPM Channel standard per M/E with planar 3D effects, remaining channels optional, adding non-linear and lighting effects (Software License Key (SLK)
- Two high-quality chroma keyers standard
- Number of M/Es:
  - One for Kayak HD 100C
  - 1.5 for Kayak HD 150C
  - Two for Kayak HD 200, 200C
  - 2.5 for Kayak HD 250, 250C
  - Three for Kayak HD 300
  - 3.5 for Kayak HD 350
  - 4 for Kayak HD 400
  - 4.5 for Kayak HD 450

Note .5 M/E includes cuts and mixes, no wipes or iDPM, with simple linear/luminance keyers and no chroma keys.

- Number of inputs:
  - 24 to 48 for Kayak HD 100C, 150C
  - 48 for Kayak HD 200C, 250C
  - 48 to 96 for Kayak HD 200, 250
  - 72 to 96 for Kayak HD 300, 350
  - 96 for Kayak HD 400, 450
- Number of outputs:
  - 12 to 24 for Kayak HD 100C, 150C
  - 24 for Kayak HD 200C, 250C
  - 24 to 48 for Kayak HD 200, 250
  - 36 to 48 for Kayak HD 300, 350
  - 48 for Kayak HD 400, 450
- Video outputs programmable as M/E, Program or AUX bus outputs
- GPI (General Purpose Interface) inputs:
  - Eight to 16 for Kayak HD 100C, 150C
  - 16 for Kayak HD 200C, 250C
  - 16-32 for Kayak HD 200, 250
  - 24-32 for Kayak HD 300, 350
  - 32 for Kayak HD 400, 450
- GPI/Tally Outputs:
  - 32-64 for Kayak HD 100C, 150C
  - 64 for Kayak HD 200C, 250C
  - 64-128 for Kayak HD 200, 250
  - 96-128 for Kayak HD 300, 350
  - 128 for Kayak HD400, 450
- Four full-function keyers per full M/E, each with linear and luminance keying
- Five background generators include black, white, and three color backgrounds
- Test Pattern Generator
- Two analog reference inputs (tri-level sync and black burst) and HD/SD serial digital input reference
- White or colored pushbutton keycaps (factory installed, choose when ordered)
- Freeze frame buffer on every full-function keyer

- Two main wipe generators and 4 keyer wipe generators per M/E
- YUV Color correction on every keyer and background bus
- Internal four-port Gigabit Ethernet (10/100/1000 base T) switch
- Eight serial ports for external machine control

Kayak HD Options

- Internal six-channel RAMRecorder option for video clips and stills
- Three additional iDPMs with 2D transforms and crops on keyers 2, 3, and 4 per M/E
- DPM Kurl per M/E. Adds Kurl effects to all of the enabled DPMs in one M/E. Includes Page Turn, Page Roll, Spheres, Ripples, Splits, Mirrors, and Slits
- DPM Spektra Lighting, Defocus, Glow, and Output Recursives. Adds Spektra effects to all of the enabled DPMs in one M/E.
- Four channels of eDPM with 2D transforms and crops that re-enter on any M/E
- Kurl for eDPM
- Spektra for eDPM
- RGB color correction option on every keyer and background bus, or per input
- Dual Chromatte™ chroma keyers, with flexible licenses allowing assignment of Chroma keys to different keyers
- Remote monitoring and diagnostic support via NetCentral software
- KHD-PSU internal redundant power supply unit
- KDD-PSU rack-mounted remote power supply unit for remote (or additional) control panels
- MatchDef™ Dual Video Source Scalar for converting 2 SD or HD sources to the production format, maximum of 4 for up to 8 sources in the 4 RU models, up to 16 sources in the 8 RU models. One Mix/Effects or IOXPAND option required for every four sources. Scalars accept either HD or SD input and act as a frame-sync when not converting or being bypassed.
- DSK (Downstream Keyer)/ Half M/E option for full M/E systems. (SLK)
    - Adds four DSKs for up to 20 keyers for 4.5 M/Es in the 8RU frame
    - Adds four DSKs for up to 12 keyers in the 4RU frame
    - Or Half M/E Mode with A/B background mix and four Lin/Lum keyers

- I/O Expander Module adds 24 SDI inputs, 12 SDI outputs, 8 GPI inputs, 32 GPI outputs/tallies, and optionally 4 MatchDef™ scalar inputs. Fits in any available M/E slot.
- Full M/E Upgrade Option. Adds one Mix/Effects module to any Kayak HD chassis. Order one or more options to get the total M/Es required. The 4RU chassis holds up to two M/E modules and/or I/O Expander modules. One M/E upgrade option can be added to a Kayak HD 1-M/E or 1.5-M/E system if it does not also have an I/O Expander module. The 8RU chassis holds up to four M/E modules and/or I/O Expander modules. One or two upgrade options can be added to a Kayak HD or SD 2-M/E system, less any I/O Expander modules in the chassis.
- Upgrade Kit for minor modifications of XtenDD panels to enable control of a Kayak HD/SD video processor frame.

Supported Control Protocols

- VTRs (BVW-75)
- AMP (Advanced Media Protocol). For Profile PVS, XP, K2, M Series, and Turbo DDRs. RS422 Serial supported
- Video servers (Louth VDCP, Odetics)
- Routers/Routing Control Systems (Trinix™, Venus™, Triton™, and third party routers; Jupiter™ and Encore™ router control systems)
- Control Systems (Grass Valley Andromeda™ and third-party systems)
- Grass Valley Under Monitor Displays (Serial tally for UMD. Requires Grass Valley Andromeda™ system or third-part tally box such as Tally Display Corp. or Image Video.)
- Grass Valley external Remote AUX Panels (CP-300 Series)
- ESAM II for audio-follow-video applications
- Edit controllers (native and Grass Valley Model 100 and 200 or DD35)

System Components

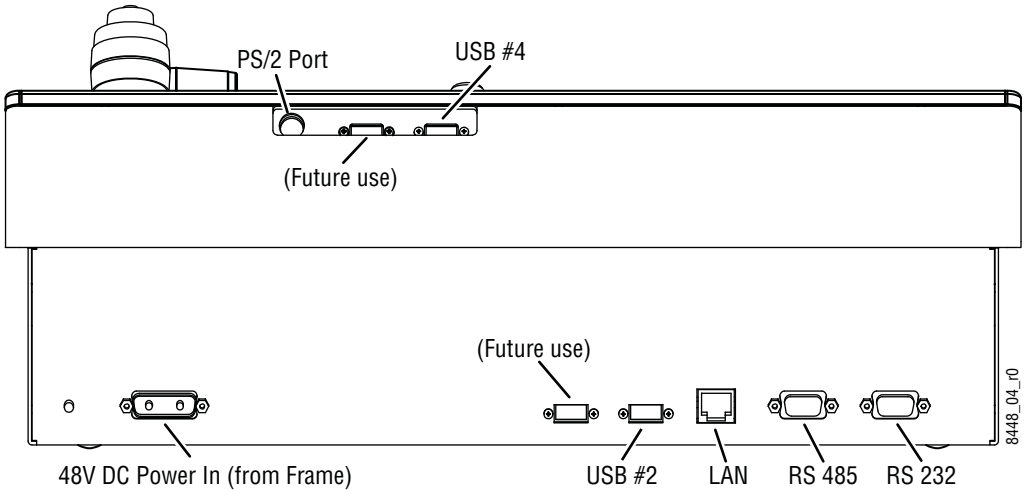
Kayak HD Control Surfaces

Kayak HD Production Switcher systems use a control panel with an integrated menu display (color TFT with touch-screen). The Sidepanel program, which runs on a user-supplied Windows PC, can also be used to control the Kayak HD system.

1 M/E Control Panel

Figure 1. 1 M/E Control Panel, Top View

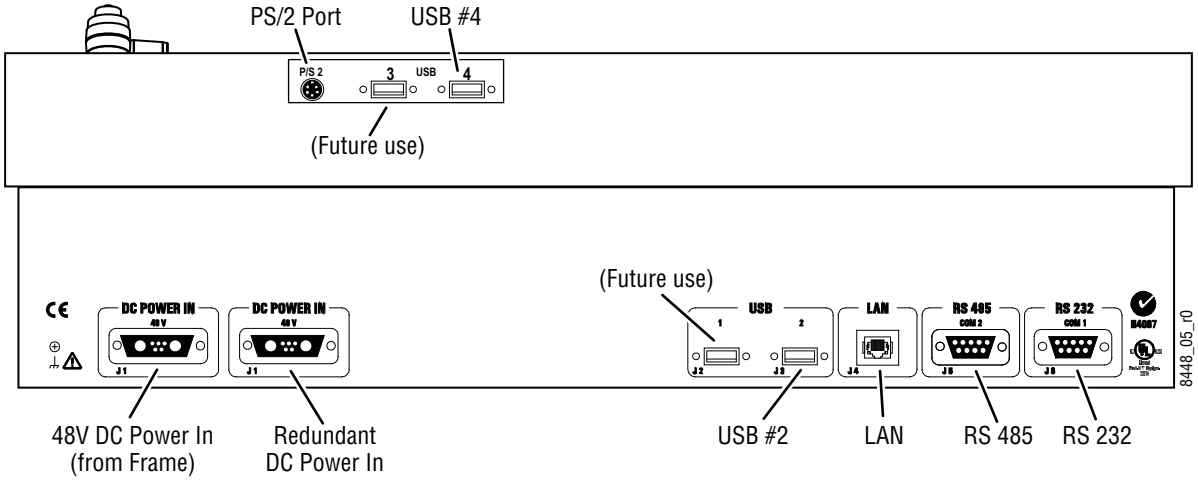
Figure 2. 1 M/E Control Panel, Rear View



1.5 and 2 M/E Control Panel

Figure 3. Kayak HD 150C, 200C, and 200 Control Panel

Figure 4. 2 M/E Control Panel, Rear View



2.5 and 3M/E Control Panel

Figure 5. Kayak HD 250C, 250, and 300 Control Panel

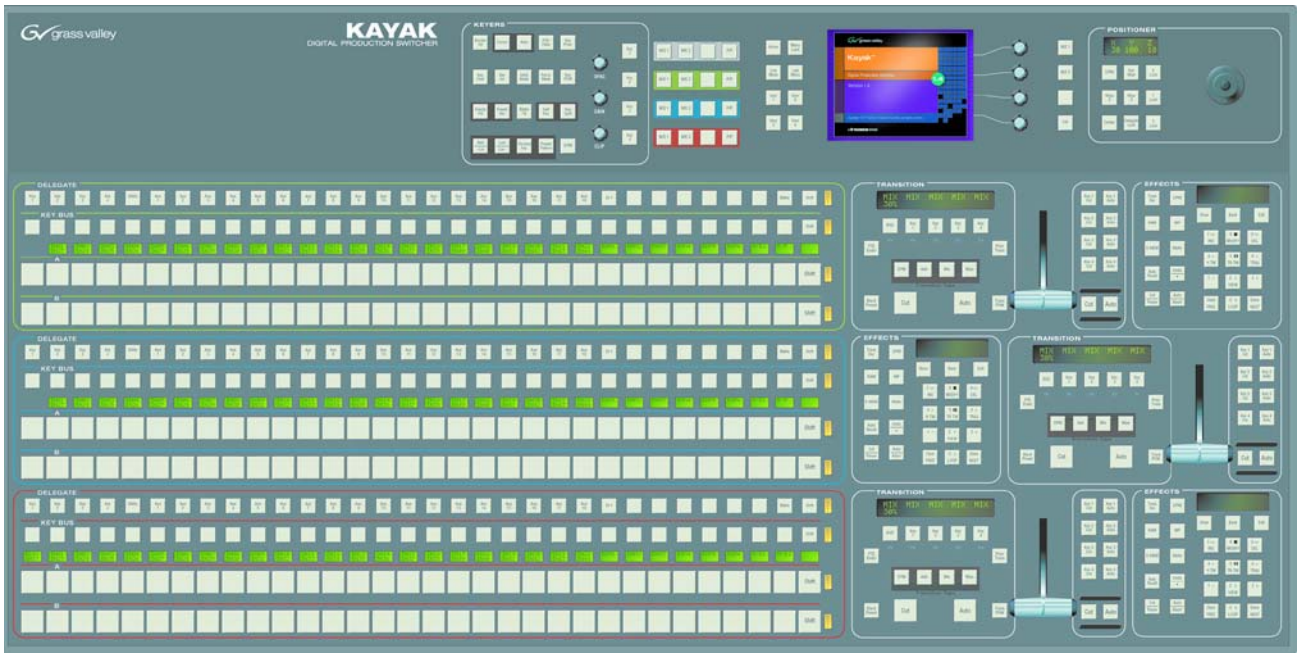
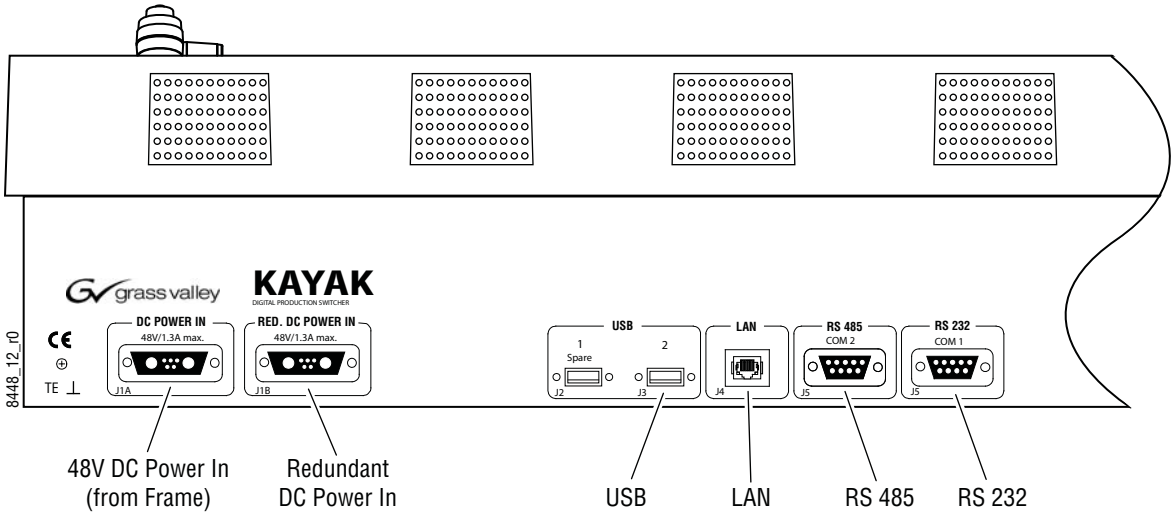


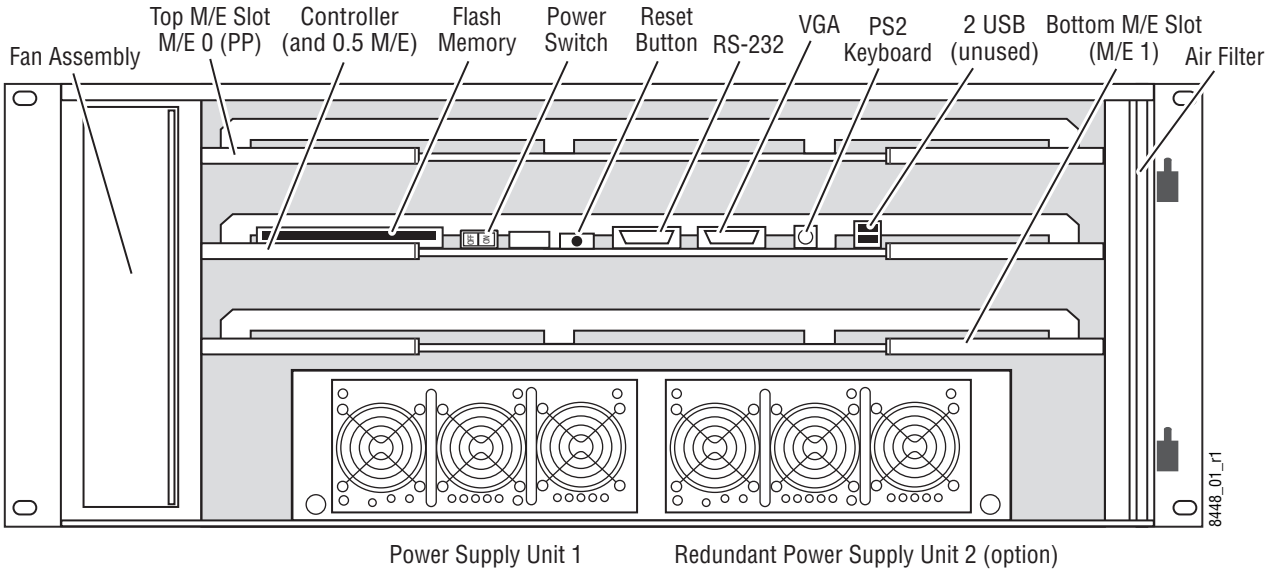
Figure 6. 3 M/E Control Panel, Rear View



Kayak HD Video Processor Frames

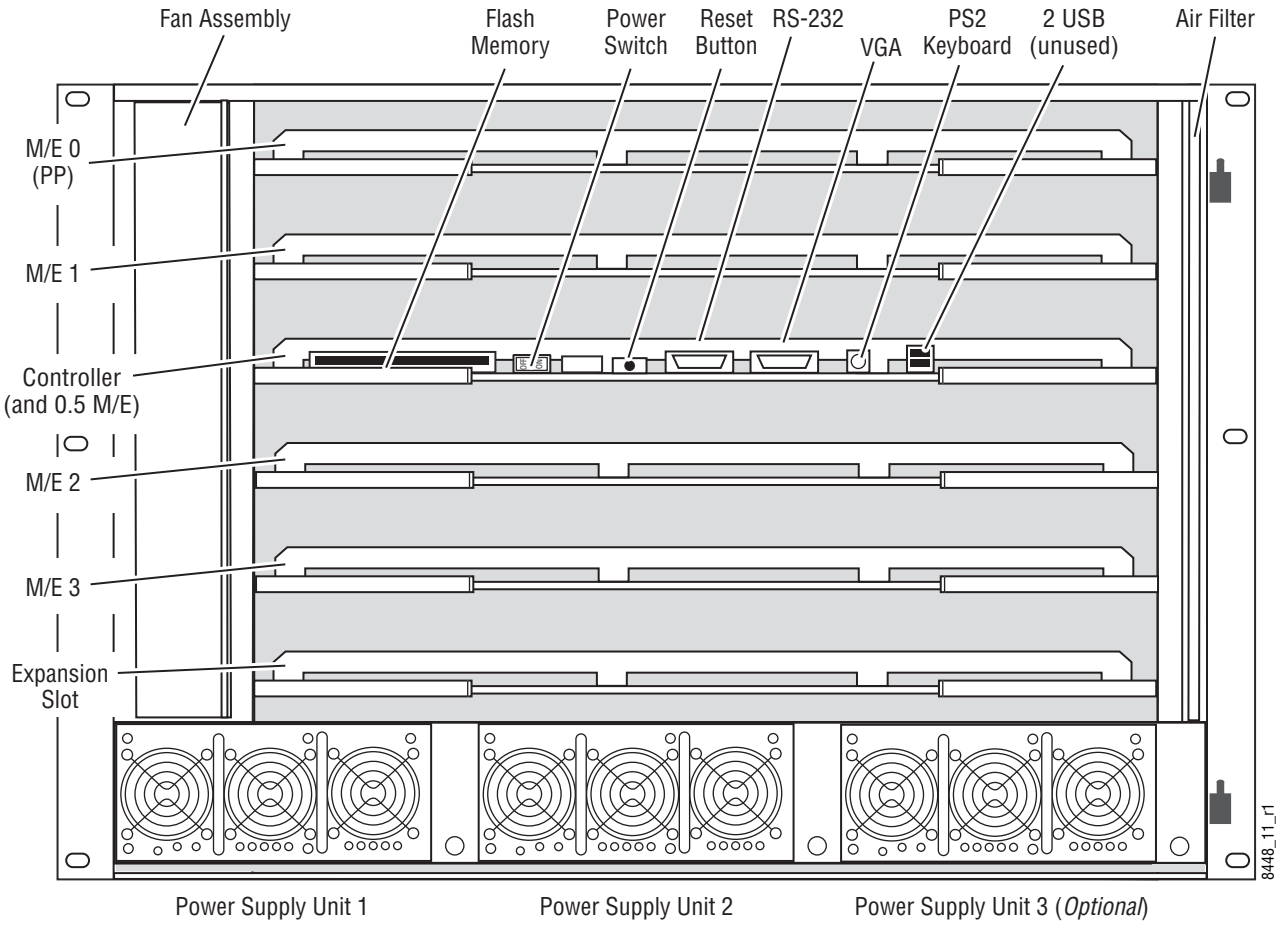
Kayak 4 RU Frame

Figure 7. Kayak HD 4RU Frame, Front View with Door Removed



Kayak 8 RU Frame

Figure 8. Kayak HD 8RU Frame, Front View with Door Removed



KDD-PSU Power Supply Option

The KDD-PSU option is a one-rack unit, wide range AC power supply providing power for a remotely-mounted Kayak HD Control Panel or for each additional Control Panel connected to the same processor chassis.

Power output is sufficient for two 1 M/E systems or one 2 M/E system.

Grass Valley recommends that customers purchase this option if the distance from the Frame to the Control Panel is more than 100 meters.

Figure 9. KDD-PSU

Figure 10. KDD-PSU Rear View

Video Signal Flow

The basic video signal flow (Figure 11 on page 31) of the Kayak HD system has been designed for operational flexibility. For example, all the outputs from the M/E are routed back to the video crosspoint matrix, making all these signals accessible to the entire system.

The video inputs to the Video Processor frame can be mapped to any of the crosspoint buttons.

Internally generated white, black and three color backgrounds are also available sources, as are the six RAMRecorder outputs. This source-to-button mapping is performed through the touch screen menu and can be stored as a user profile for any number of individual users. Button mapping is the same on all buses.

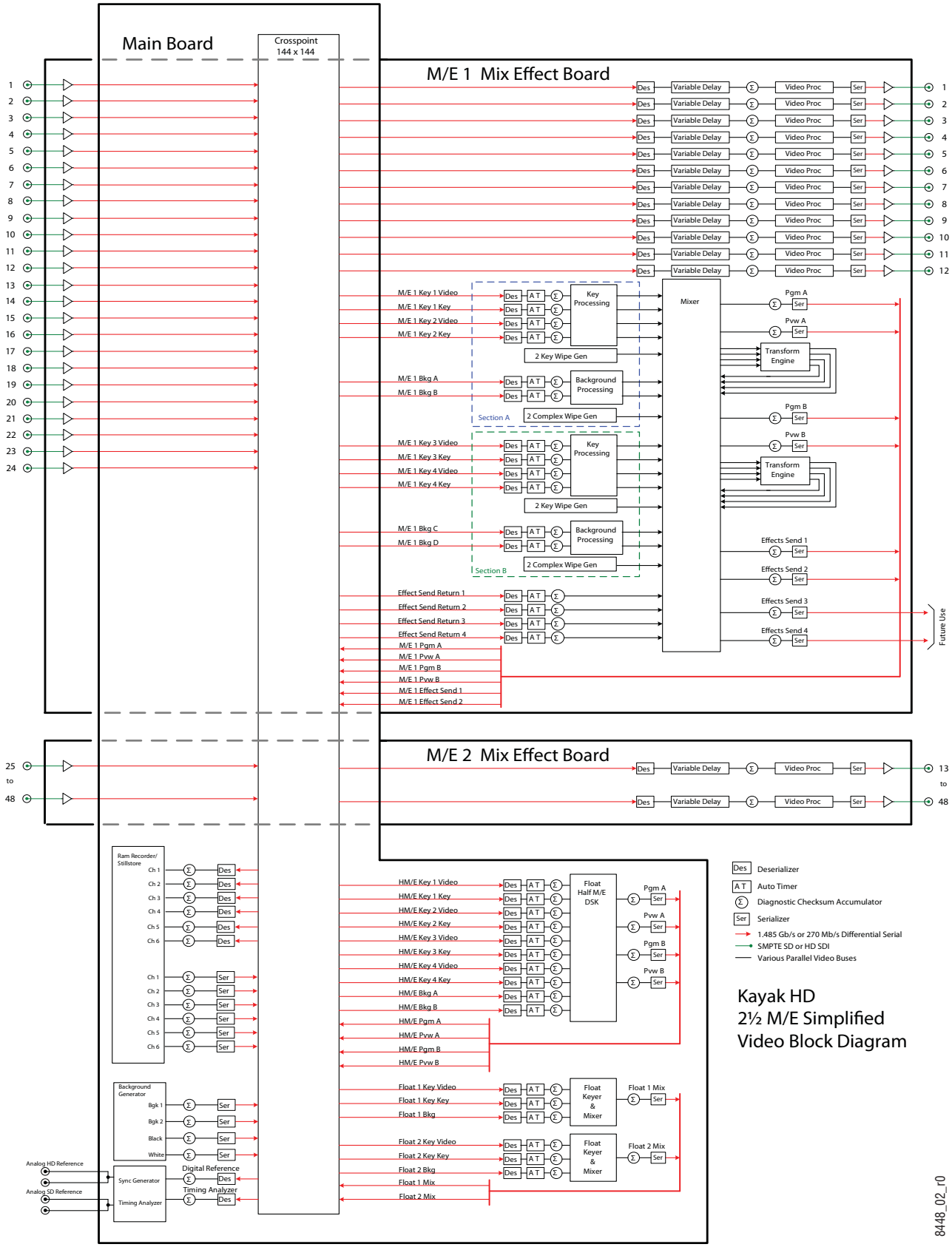
The selected video on each bus is deserialized and reclocked before entering the video processing circuitry. Video processing is available for each separate M/E background, Key, and Utility bus. In addition, contrast, brightness, and hue can be adjusted on a bus-by-bus basis.

Each M/E has four full-function keyers with optional internal Digital Picture Manipulator effects. Each keyer has access to its own wipe generator as well as a pair of standard flexible chroma keyers which may be assigned to any keyers in the system. Two complex wipe generators serve each M/E, providing a wide range of wipe choices with modulation, rotation and multiplication of each one. Wipe signals can also be taken from the two Utility buses on the M/E.

The outputs from M/E Program, Preview, and clean feed are fed back to the crosspoint circuitry for the selection on the Auxiliary buses as well as the clean feed output.

The AUX bus outputs can be utilized in a number of ways. Every AUX bus provides individually adjustable safe area and crosshair (center cross) capability. Each AUX bus is timed to the reference.

Figure 11. Kayak HD Video Signal Flow



Section 2

Installation

Pre-Installation Procedures

Before you physically install the Kayak HD system, familiarize yourself with the tools required, physical specifications, and safety and power requirements covered in this section.

System Survey

Check all parts received against the packing list enclosed with your shipment, and examine the equipment for any shipping damage. Immediately report any missing or damaged items to the carrier and to your Thomson Grass Valley Service Representative.

Line Voltage

Kayak HD components utilize auto-ranging power supplies which accommodate 100 - 240V. No switch settings are required, nor are any possible.

Required Tools

The following tools are required for installation, but are not supplied:

- Medium flat blade screwdriver,
- Medium Philips cross head screwdriver,
- #10, #15, & #20 Torx screwdrivers, and
- 1/4 inch Hex driver.

Safety Requirements

To prevent injury or equipment damage, read, understand, and follow all installation safety precautions.

CAUTION The Video Processor frame weighs approximately 8.3 kg (18.3 lb). Provide appropriate equipment to support the frame during installation.

WARNING Electrical potential is still applied to some internal components even when power to the frame is off. To prevent electrical shock when working on this equipment, disconnect the AC line cords from the AC source before working on any internal components. Residual voltage may be present immediately after unplugging the system; wait thirty seconds to allow capacitors to discharge before working on the system.

CAUTION To avoid static damage to sensitive electronic devices, protect the Kayak HD system from static discharge. Avoid handling frame modules in a high static environment. Use a grounding strap when handling modules, and touch the frame before you remove any modules.

WARNING Operate only with covers and enclosure panels in place — Do not operate this product when covers or enclosure panels are removed.

Installation Tasks

After completing the Pre-Installation procedures, the recommended installation tasks given in this section are:

1. Unpack the equipment.
2. Install the Kayak HD Video Processor frame.
3. Install the Kayak HD control panel(s).
4. Connect all cables between Kayak HD devices.
5. Connect cables to video inputs and outputs.
6. Connect the power cables.

Power up and configuration, including setting IP addresses, is covered in detail in the following sections of this manual.

General Rack Mounting Instructions

The maximum ambient temperature for this unit is 40-degrees C (104-degrees F).

Installing the frame in a closed or multi-unit rack assembly together with other units could increase the maximum ambient temperature for this unit.

If the unit is installed in a rack, no ventilation openings should be blocked or otherwise covered. Make sure you install the frame so that you allow for cooling airflow.

Make sure that you mount the unit in the rack so that it is evenly balanced to prevent damage to the frame and to avoid creating a hazardous condition.

When connecting the unit to the supply circuit be sure that the supply circuit of the rack is not overloaded. The unit must be well-grounded using the ground connector on the rear. When connecting the unit in a closed or multi-unit rack assembly together with other units be sure that the sum of the touch (leakage) currents for all power supplies does not exceed 3.5 mA.

4 RU Frame

Video Processor Frame Installation

4 RU Compact Frame Dimensions

Figure 12. Kayak HD 4 RU Frame Dimensions

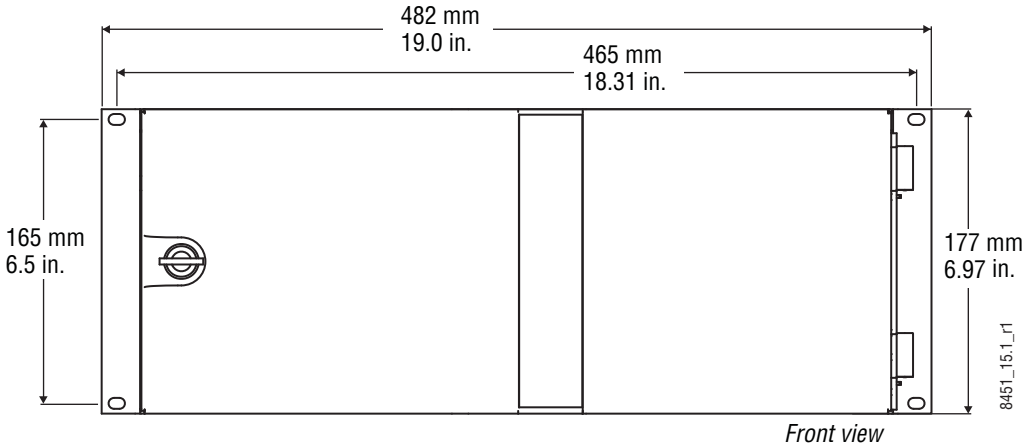
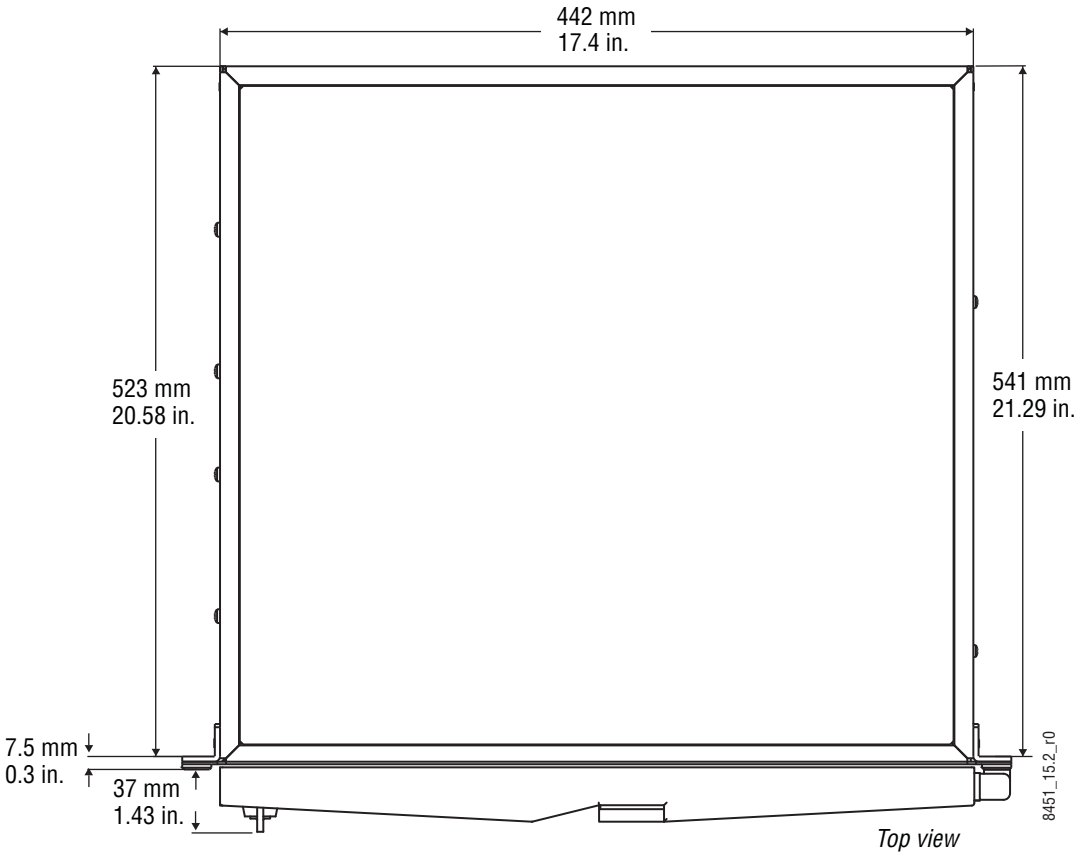
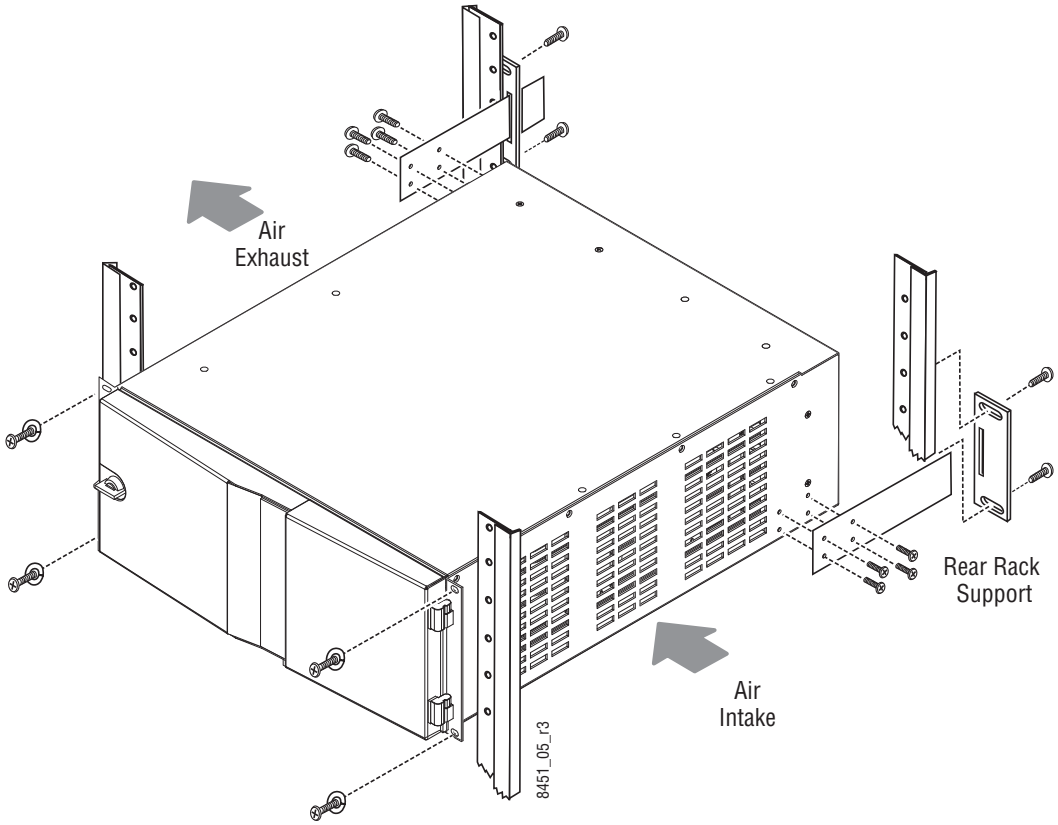


Figure 13. Kayak HD 4 RU Frame Dimensions



4 RU Compact Frame Rack Mounting

Figure 14. Kayak HD 4 RU Compact Frame Rack Mounting



CAUTION Mounting using only the front rack ears is sufficient for fixed installations. Additional support, like the rear rack support or slide rails, is required for mobile applications.

The Rear Rack support provides additional support and stability for the Kayak HD frame to ensure that it remains horizontal.

Make sure to provide adequate ventilation for the Kayak HD Frame. When installing the frame in the rack, take care that no ventilation holes are blocked. This can prevent cooling air from reaching the frame and cause it to overheat.

There are air intake holes on the right side of the frame (as you face the frame front) and air exhaust holes on the left.

CAUTION A minimum vertical clearance of 7.62 mm (0.3-in.) above the Kayak HD 4 RU Compact frame door is required to remove the door. When installing the Kayak HD 4 RU Compact frame in the rack, take care to leave room for removal of the front door. The front door lifts off vertically and must have sufficient clearance room in order to remove it. If you have equipment mounted too close to the Kayak HD 4 RU Compact Frame, you may not be able to remove the door.

Kayak HD Video Processor 4 RU Frame

Figure 15. Kayak HD 4RU Frame, Front View with Door Removed

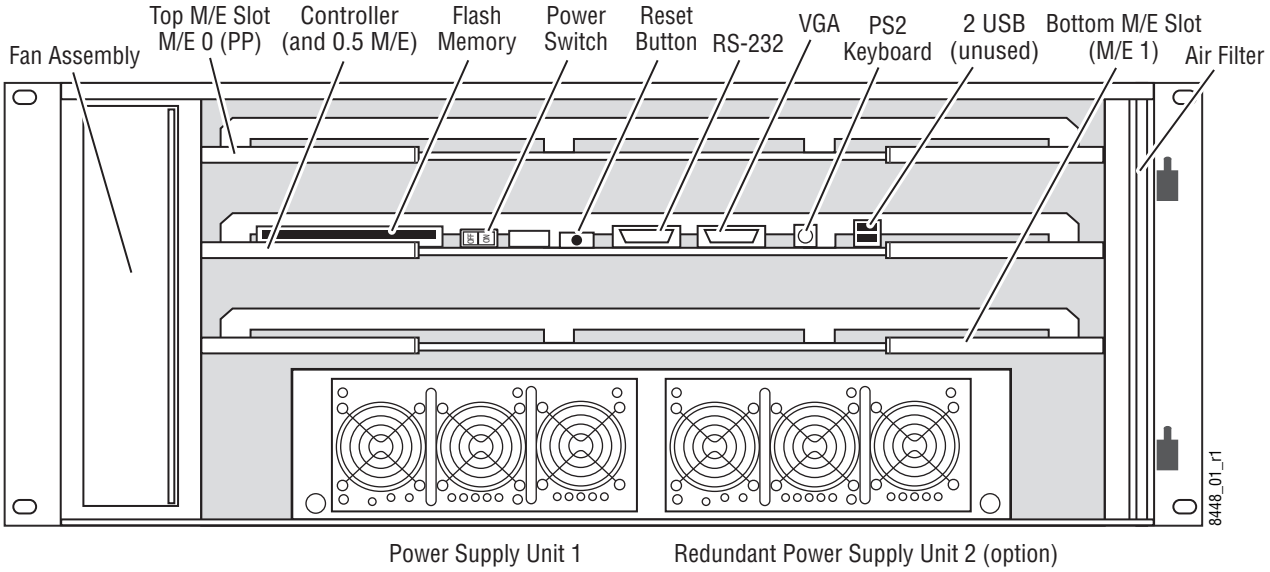
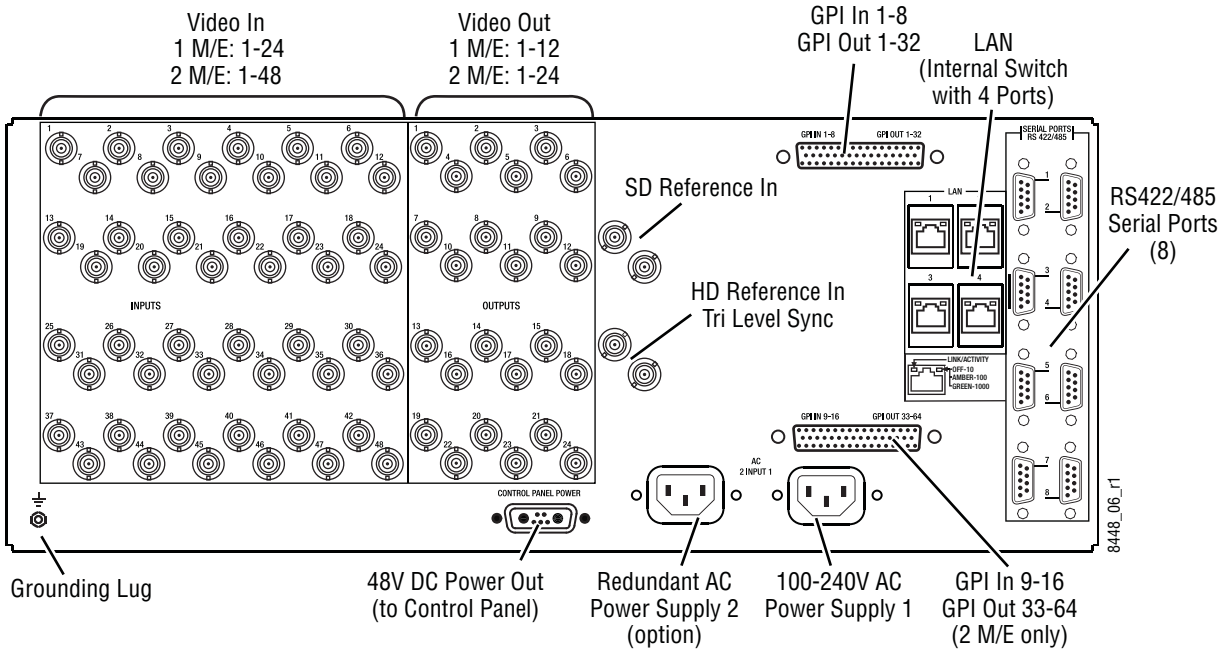


Figure 16. Kayak HD 4RU Frame, Backplane View

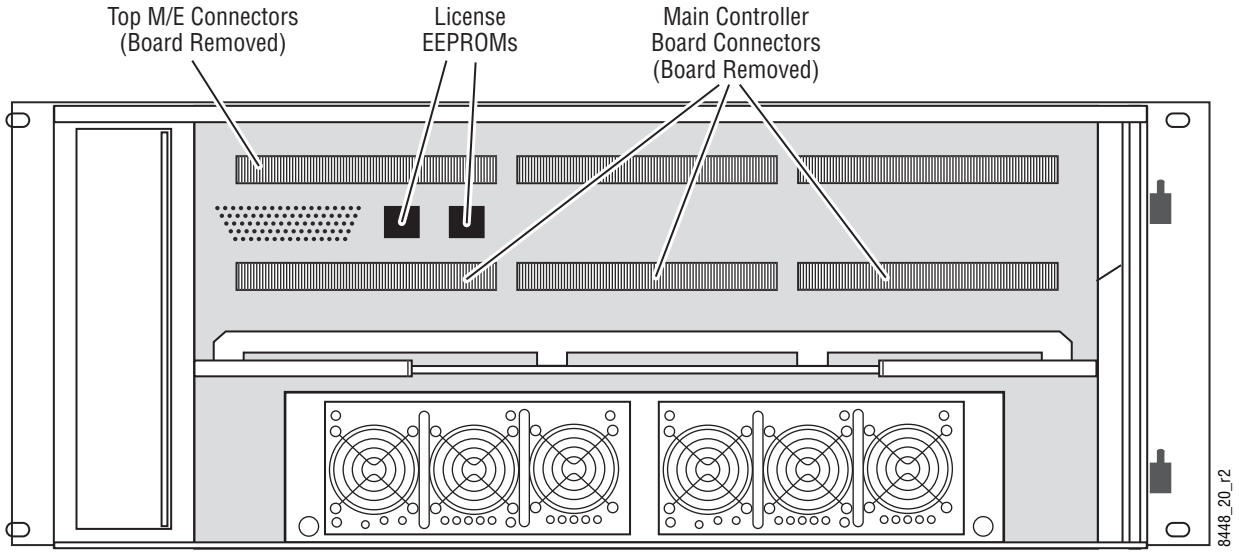


License EEPROMs

Kayak systems use two EEPROM (Electronically Erasable Programmable Read Only Memory) chips to set the licenses that determine which features are available for use. Licensing is keyed off of the serial number for the Kayak frame.

Note If you have a frame and are replacing it with a new frame, the new license stored in the EEPROM chips for the new frame is issued to the serial number for the new frame.

Figure 17. License EEPROMs in 4 RU Frame, Main Controller Board and ME0 Removed



Note If you have to exchange your frame for any reason you may want to first pull the two EEPROMs to put in your new frame. Make sure they are put in the right position (the same position they had on the older frame).

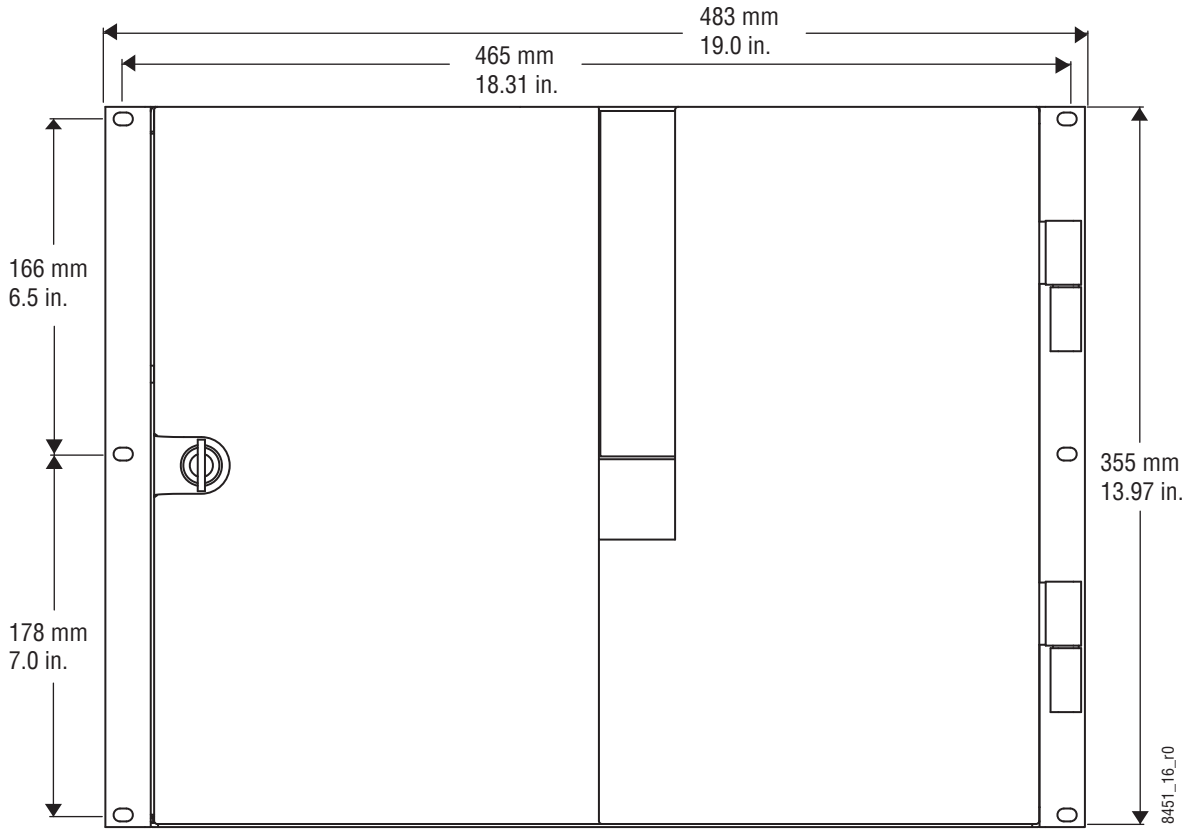
Note You should always keep a copy of your license text file or you may lose all features, including Inputs, chroma keys, and DPMs. If you have lost your license, contact Customer Service. (See *Contacting Grass Valley* *on page 4*.)

8 RU Frame

Video Processor Frame Installation

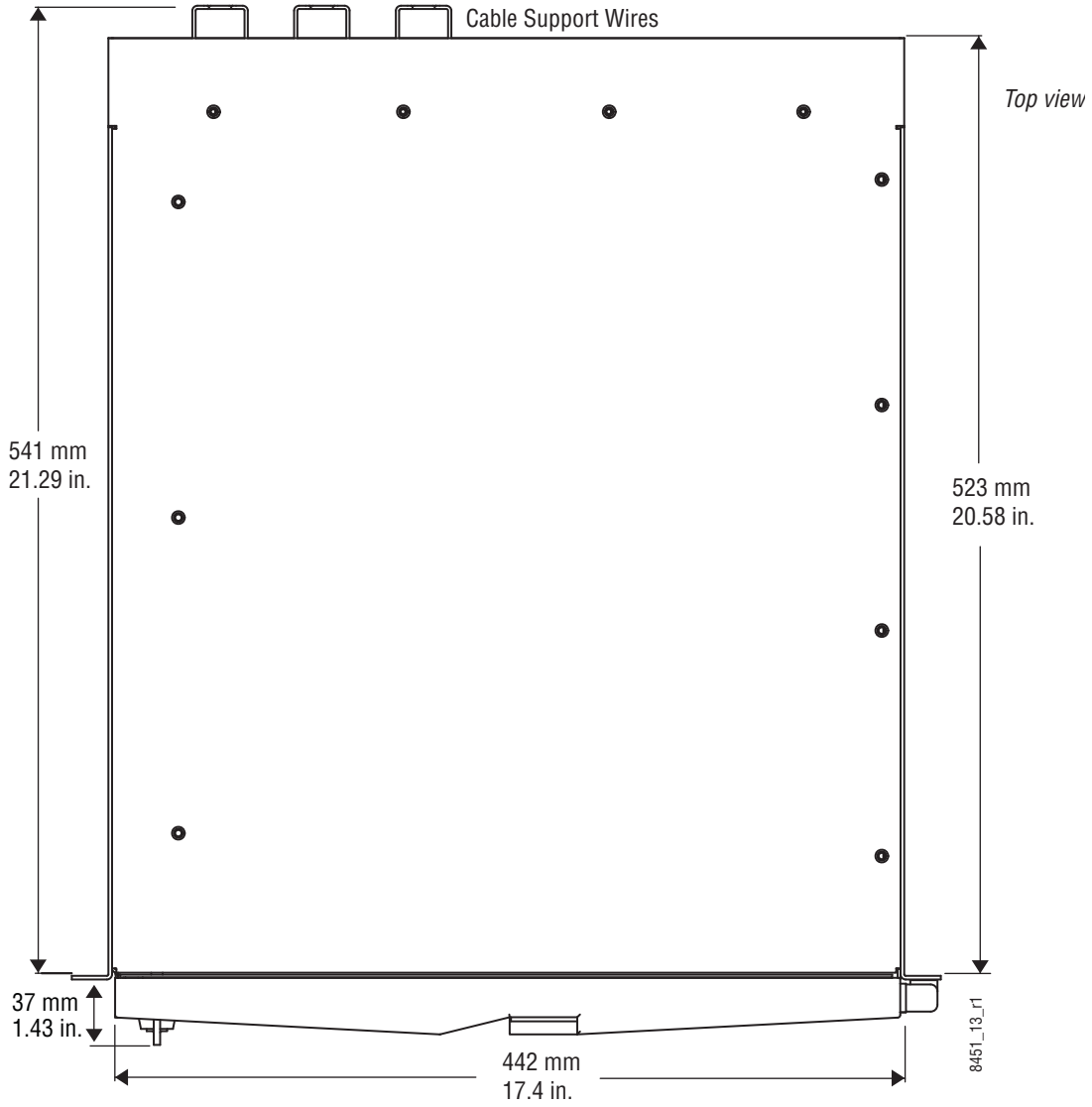
8 RU Frame Dimensions

Figure 18. Kayak HD 8 RU Frame Dimensions 1 of 2



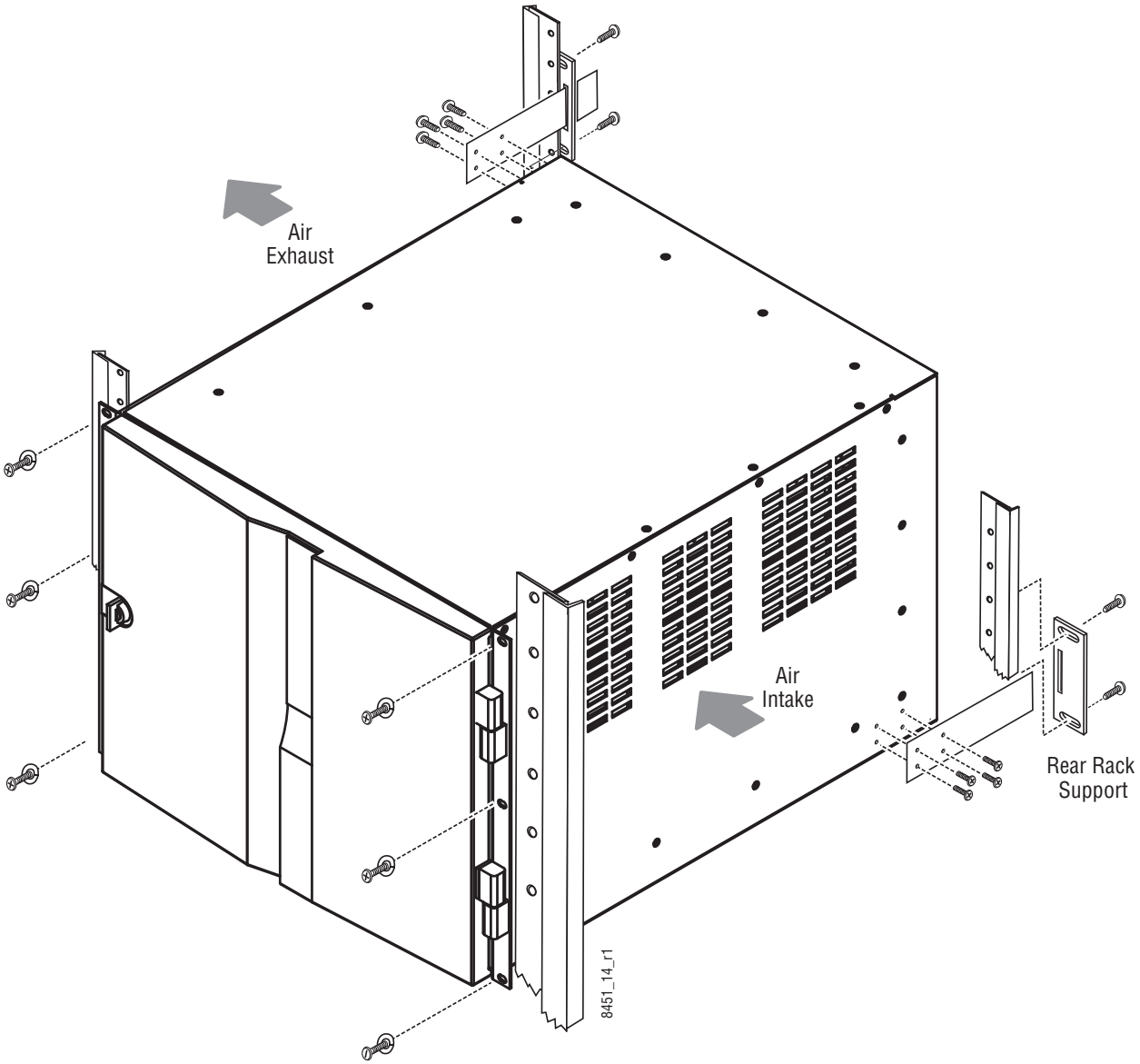
Front view

Figure 19. Kayak HD 8 RU Frame Dimensions 2 of 2



8 RU Frame Rack Mounting

Figure 20. Kayak HD 8 RU Frame Dimensions



CAUTION Mounting using only the front rack ears is sufficient for fixed installations. Additional support, like the rear rack support or slide rails, is required for mobile applications.

The Rear Rack support provides additional support and stability for the Kayak HD frame to ensure that it remains horizontal.

Make sure to provide adequate ventilation for the Kayak HD Frame. When installing the frame in the rack, take care that no ventilation holes are blocked. This can prevent cooling air from reaching the frame and cause it to overheat.

There are air intake holes on the right side of the frame (as you face the frame front) and air exhaust holes on the left.

CAUTION A minimum vertical clearance of 7.62 mm (0.3-in.) above the Kayak HD 8 RU frame door is required to remove the door. When installing the Kayak HD 8 RU frame in the rack, take care to leave room for removal of the front door. The front door lifts off vertically and must have sufficient clearance room in order to remove it. If you have equipment mounted too close to the Kayak HD 8 RU Frame, you may not be able to remove the door.

Figure 21. Kayak HD 8RU Frame, Front View with Door Removed

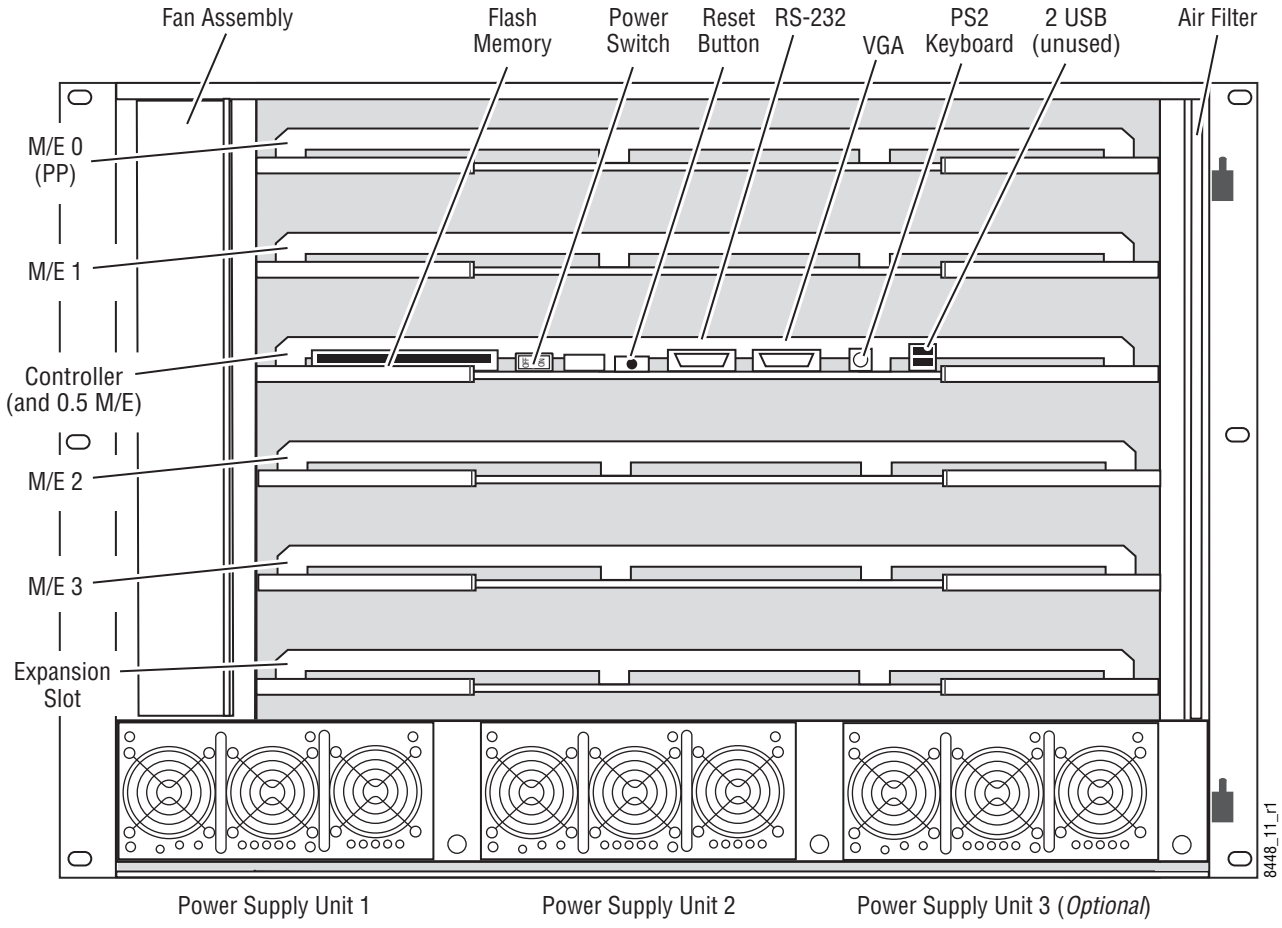
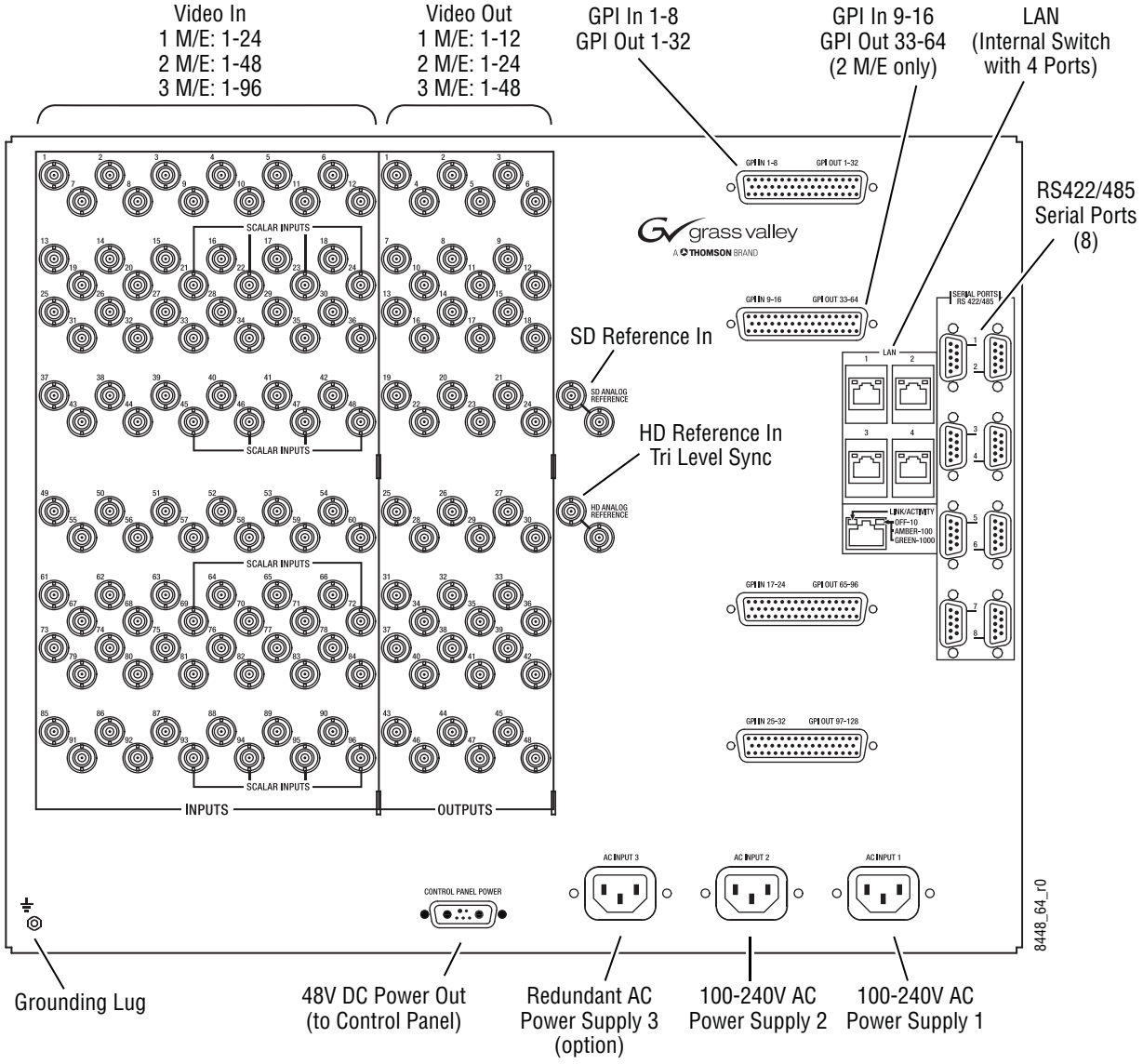


Figure 22. Kayak HD 8RU Frame, Backplane View



Kayak HD Frame Connectors

Table 1. Kayak HD Frame Connectors

Designation	Note
AC POWER IN 1 AC POWER IN 2	Mains connectors (IEC-320, CEE-22) to provide power supply to the video processor frame. Operating Voltage: 100V-240V AC +/-10% widerange Caution: For continued protection against risk of fire, replace only with same type and rating of fuse. 2x T 6.3A /H 250 Double-pole or neutral fusing — Disconnect mains power prior to servicing. After a fuse opens, high voltage in parts of the equipment may still present a hazard to you during servicing.
AC POWER SWITCH	Frame power switch.
INPUTS IN1 – IN24	BNC / Serial Comp (ITU-R 656) video inputs Maximum cable length 100m HD, 300m SD (typical).
INPUTS IN25 - IN48	BNC / Serial Comp (ITU-R 656) video inputs In 25 …48: Maximum cable length 100m HD, 300m SD (typical). NOTE: The last 4 inputs in each group have the scalar option.
INPUTS IN49 - IN73 (8 RU FRAME ONLY)	BNC / Serial Comp (ITU-R 656) video inputs In 49 …73: Maximum cable length 100m HD, 300m SD (typical). NOTE: The last 4 inputs in each group have the scalar option.
INPUTS IN74 - IN96 (8 RU FRAME ONLY)	BNC / Serial Comp (ITU-R 656) video inputs In 74 …96: Maximum cable length 100m HD, 300m SD (typical). NOTE: The last 4 inputs in each group have the scalar option.
24 MAPPABLE OUTPUTS	BNC / Serial Comp (ITU-R 656) Double Program output Preview output Clean output Clean Preview output
AUX 1 – AUX10	Auxiliary Outputs, BNC / Serial Comp (ITU-R 656)
SD ANALOG REFERENCE INPUT PAIR	Reference input, BNC / 75 ohms Loop through sync input for analog Blackburst or CCVS signal.
HD ANALOG REFERENCE INPUT PAIR	Reference input, BNC / 75 ohms Loop through sync input for analog Blackburst or CCVS signal.
RS 422/485 PORTS (PORTS 1-8)	Eight control ports, 9-pin D-type female RS422/485 serial ports for devices such as DVEs, Editors, Routers and for Machine Control (Disk Servers, VTR).
GPI / GPO / TALLY INPUTS 1-8, 9-16 OUTPUTS 1-32, 33-64	50-pin D-type female General-purpose interface connector with 8 input channels and 32 output channels. The connector is used for Tally also. Refer table below for respective pin assignment.
LAN	Four RJ45 connectors for LAN connection to the Control Panel. Optional cables with lengths of 20m or 50m can be ordered.
DC POWER IN	Input connector for external DC Power Supply Unit (KDD-PSU) for redundancy (High current D-Sub, female). (See *KDD-PSU Power Supply Option on page 56*.) Input voltage: 48V/ 5A Note: The external power supply unit must comply with the SELV (Safety Extra Low Voltage) standard exclusively. ELV and TNV standard is not permitted. Additionally the 8V DC voltage for RAM Recorder buffering can be supplied via this socket.
DC POWER OUT	Output connector for Panel DC Power Supply. (High current D-Sub, male). Output voltage: 48V/ 1.6A max. A 10m DC power connecting cable is supplied.

Internal Redundant Power Supply Option

This option provides redundant power for the Kayak HD video processor chassis and control panel. It slides into an extra power supply slot in the video processor chassis.

Figure 23. KHD-PSU Internal Redundant Power Supply Option

Removing and Replacing the Kayak HD Frame Door

WARNING **Be very careful when opening the Kayak HD frame door. Take precautions to avoid electrical shock from components by following the safety precautions described in detail in *Warnings* *on page 16* and in *Cautions* *on page 17*. In particular you want to avoid the possibility of electrical shock by powering down the system and unplugging all equipment before working on internal components. In addition you should wear a grounding strap to prevent electrical damage to sensitive electronic components.**

CAUTION **Operate only with covers and enclosure panels in place** — Do not operate this product when covers or enclosure panels are removed.

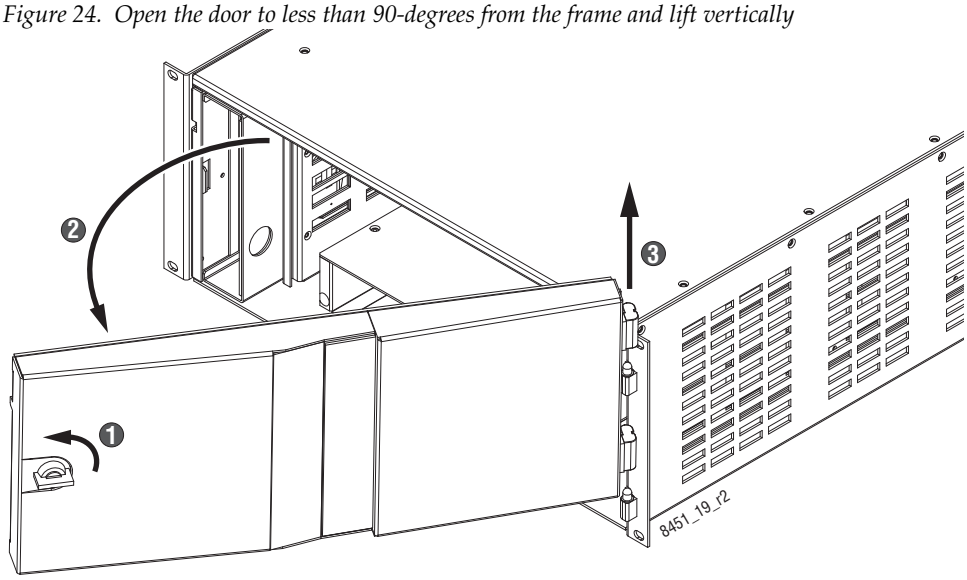
You need to take care not to damage the door by following the procedures described below.

Note A minimum vertical clearance of 7.62 mm (0.3-in.) above the Kayak HD 4 RU Compact frame door is required to remove the door. When installing the Kayak HD 4 RU Compact frame in the rack, take care to leave room for removal of the front door. The front door lifts off vertically and must have sufficient clearance room in order to remove it. If you have equipment mounted too close to the Kayak HD 4 RU Compact Frame, you may not be able to remove the door.

To remove the Kayak HD frame door:

1. Turn the lock on the front door of the Kayak HD Frame 180-degrees counterclockwise to unlock it.
2. Open the door to less than 90-degrees from the Frame.
3. Holding both ends of the Frame door, lift the door vertically to remove it from the hinge pins. Be careful not to damage the door. Refer to Figure 24.

Figure 24. Open the door to less than 90-degrees from the frame and lift vertically



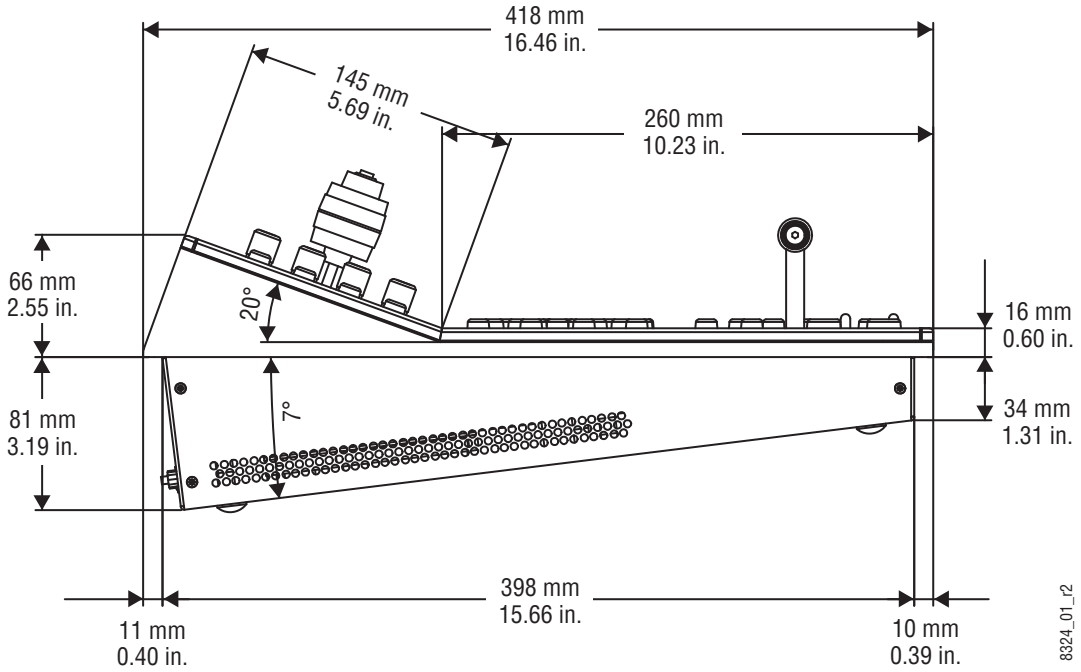
To replace the Kayak HD frame door:

1. Holding both ends of the Frame door, position the door hinges over the two vertical pins on the frame.
2. Using both hands to hold the door at opposite ends, gently lower the door so that its hinges are placed on the two pins. Be careful not to damage the door.
3. Turn the lock on the front door of the Kayak HD Frame 180-degrees clockwise to lock it.

Control Panel Installation

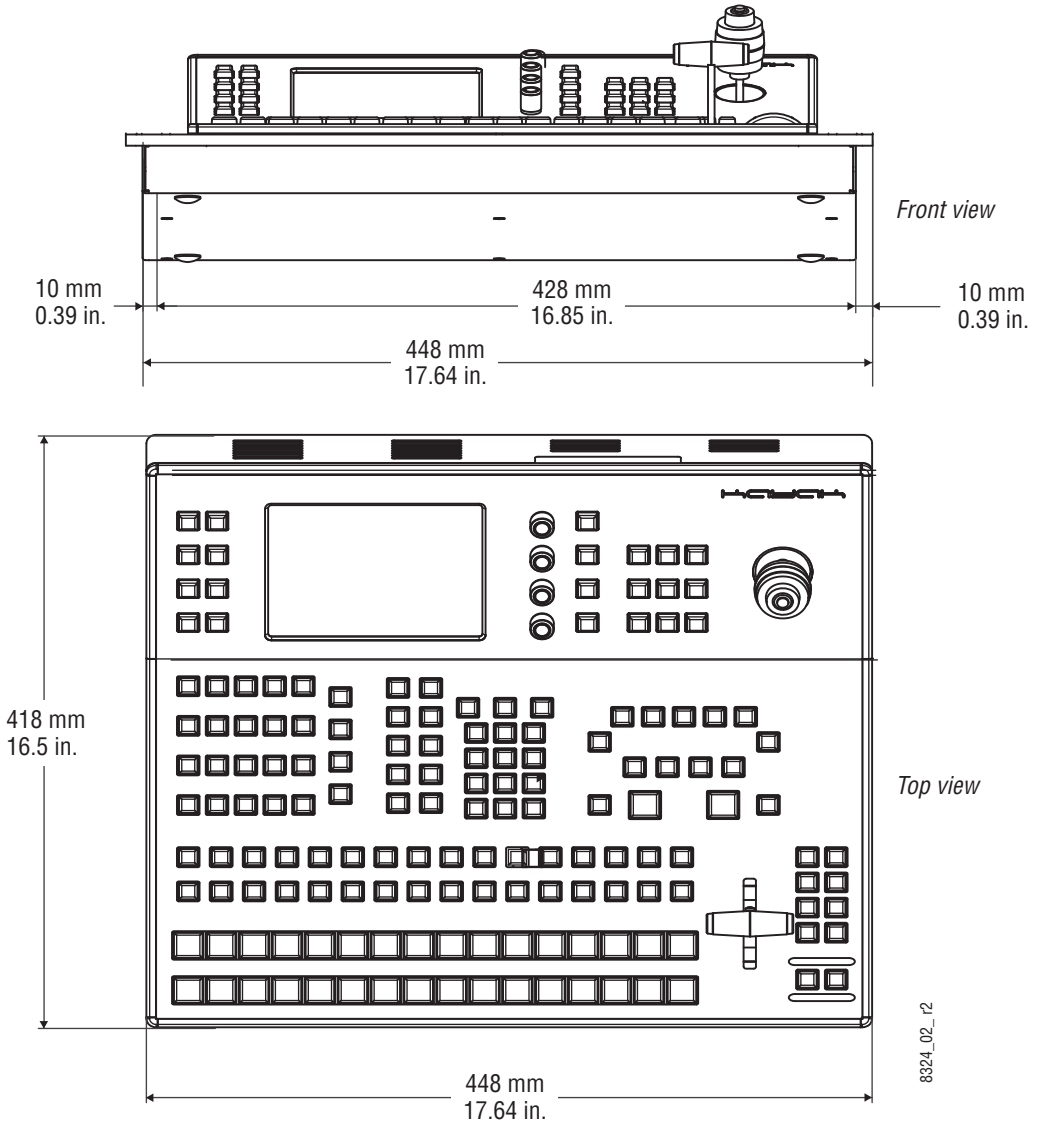
1 M/E Control Panel

Figure 25. Kayak HD 100C Control Panel Dimensions 1 of 2



Left side view

Figure 26. Kayak HD 100C Control Panel Dimensions 2 of 2



2 M/E Control Panel

Figure 27. Kayak HD 150C and 200C Control Panel Dimensions 1 of 2

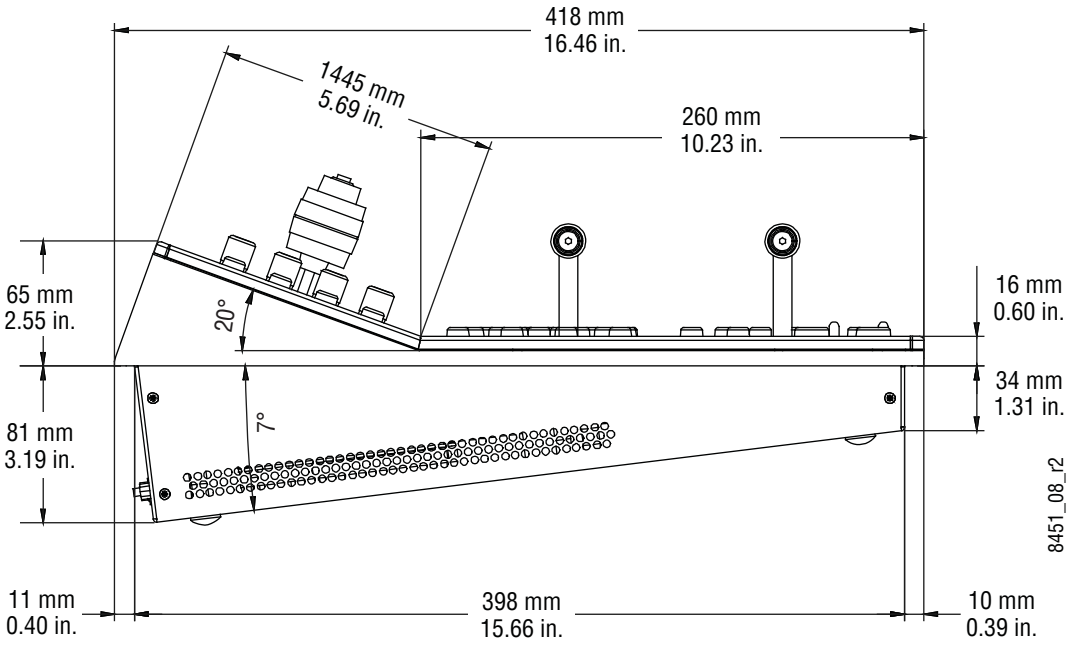
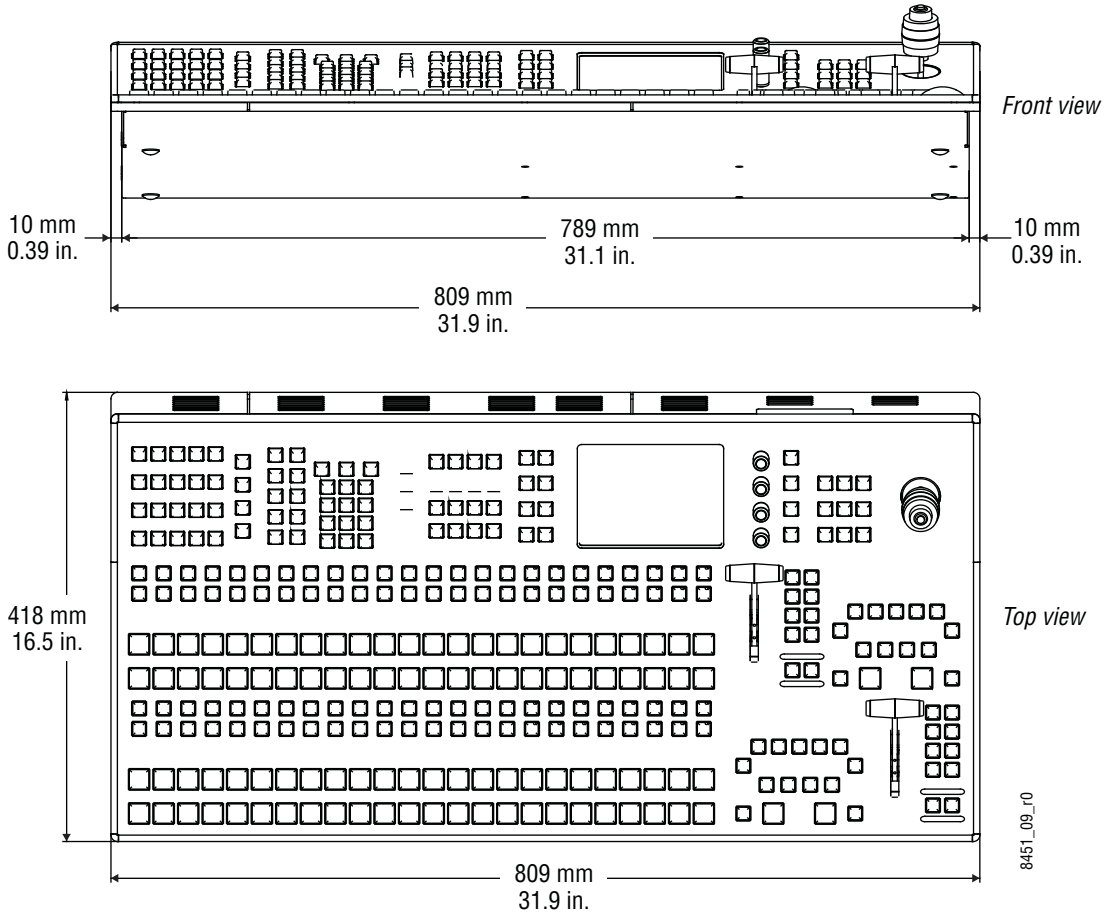
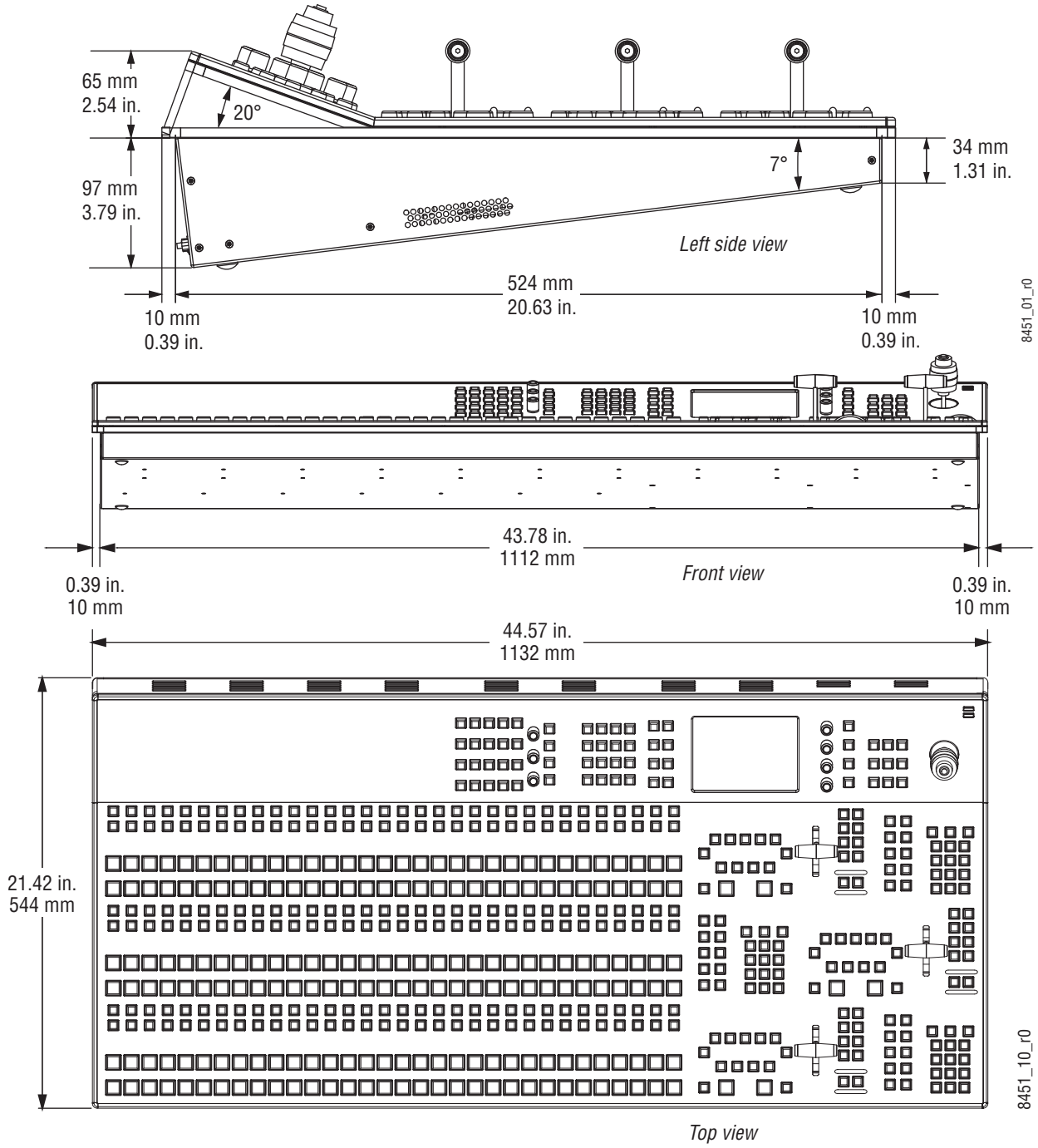


Figure 28. Kayak HD 150C, 200C, and 200 Control Panel Dimensions 2 of 2



3M/E Control Panel

Figure 29. Kayak HD 250C, 250, and 300 Control Panel Dimensions



Panel Mounting Options

Kayak HD control panels may be placed on a table or similar stable surface, or they may be recessed into a control console in an appropriately sized cutout.

Table Top Use

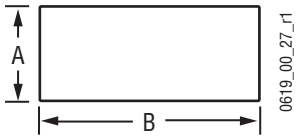
High-friction feet prevent inadvertent movement of the panel. The panel is ventilated at its sides. Ensure that production materials and other equipment does not block the ventilation holes on the sides of the panel.

CAUTION At least 2 in. (50mm) of open space on the sides of the panel is required for proper air flow.

Surface Mount Cutout Dimensions

Table 1. Kayak HD Surface Mount Cutout Dimensions

Cutout Dimensions		
Control Surfaces	**A**	**B**
Kayak HD 250C, 250, 300	526 mm (20.71 in.)	1114 mm (43.86 in.)
Kayak HD 150C, 200C, 200	400 mm (15.75 in.)	791 mm (31.14 in.)
Kayak HD 100C	400 mm (15.75 in.)	430 mm (16.93 in.)

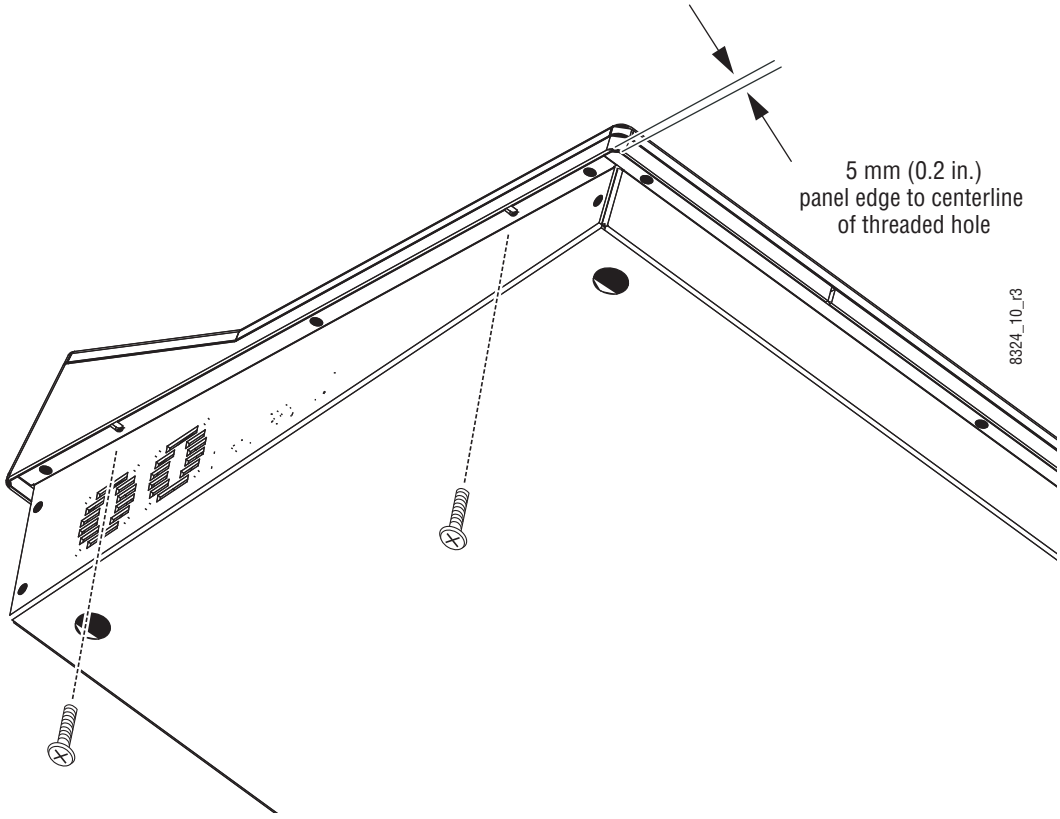


CAUTION At least 50 mm (2 in.) of clear space on the sides of the panel below the mounting surface is required for proper air flow. Provide at least 50 mm (2 in.) of clear space in the rear of the panel for cable clearance.

Securing Panels to Mounting Surface

When mounting the panel in a tabletop cutout, four M4 threaded holes (two each on the left and right side of the panel) are available for securing the panel in the cutout (Figure 30).

Figure 30. Kayak HD Panel Mounting Holes



Kayak HD Control Panel Connectors

Figure 31. Kayak HD Control Panel Rear Connectors

Table 1. Kayak HD Control Panel Connectors

Jack	Designation	Note
J1-A	DC POWER IN	DC power input connector for 48V operating voltage. Connecting with the DC POWER OUT at the Processor Frame. An interconnecting cable with a length of 10 m (32ft.) is supplied. Optional cables of 50m (164 ft) and 100m (328 ft.) length can be used. For longer distances a separate KDD-PSU 48V power supply unit must be connected to the RED. DC POWER IN connector. Note: The external power supply unit must comply with the SELV (Safety Extra Low Voltage) standard exclusively. ELV and TNV standard is not permitted.
J1-B	RED. DC POWER IN	DC power input connector for 48V operating voltage from Redundant Power Supply Unit KDD-PSU. Optional cables of 20m (64 ft) length can be used.
	M4 threaded pin	Screw terminal used for additional unit grounding.
J2	USB 1	Spare USB port, reserved for future use.
J3	USB 2	Connectors for USB devices such as a CD-ROM Drive, mouse, keyboard or USB flash drive. For a list of recommended USB flash drive refer to the section on *Recommended USB Flash Drives* in the *Kayak Release Notes*. Only recommended devices are supported.
J4	LAN	RJ45 connector for connection from the panel to the video processor frame.
J5	RS 422/485	RS422/RS485 interface for connecting external devices. The software control automatically switches over the interface to master or slave (bus control/tributary), depending on which unit driver has been selected in the menu.
J6	RS 232	RS232 interface for connecting a computer or other external devices for diagnostics.
	USB 3	Spare USB port, reserved for future use.
	USB 4	Connectors for USB devices such as a CD-ROM Drive, mouse, keyboard or USB flash drive. For a list of recommended USB flash drive refer to the section on *Recommended USB Flash Drives* in the *Kayak Release Notes*. Only recommended devices are supported.
	P/S 2	Used to connect a P/S 2 Mouse or Keyboard.

Figure 32. Kayak HD Connectors Top Rear Control Panel

KDD-PSU Power Supply Option

The KDD-PSU is a 1RU frame designed for rack mounting (Figure 33).

Figure 33. KDD-PSU Rack Installation

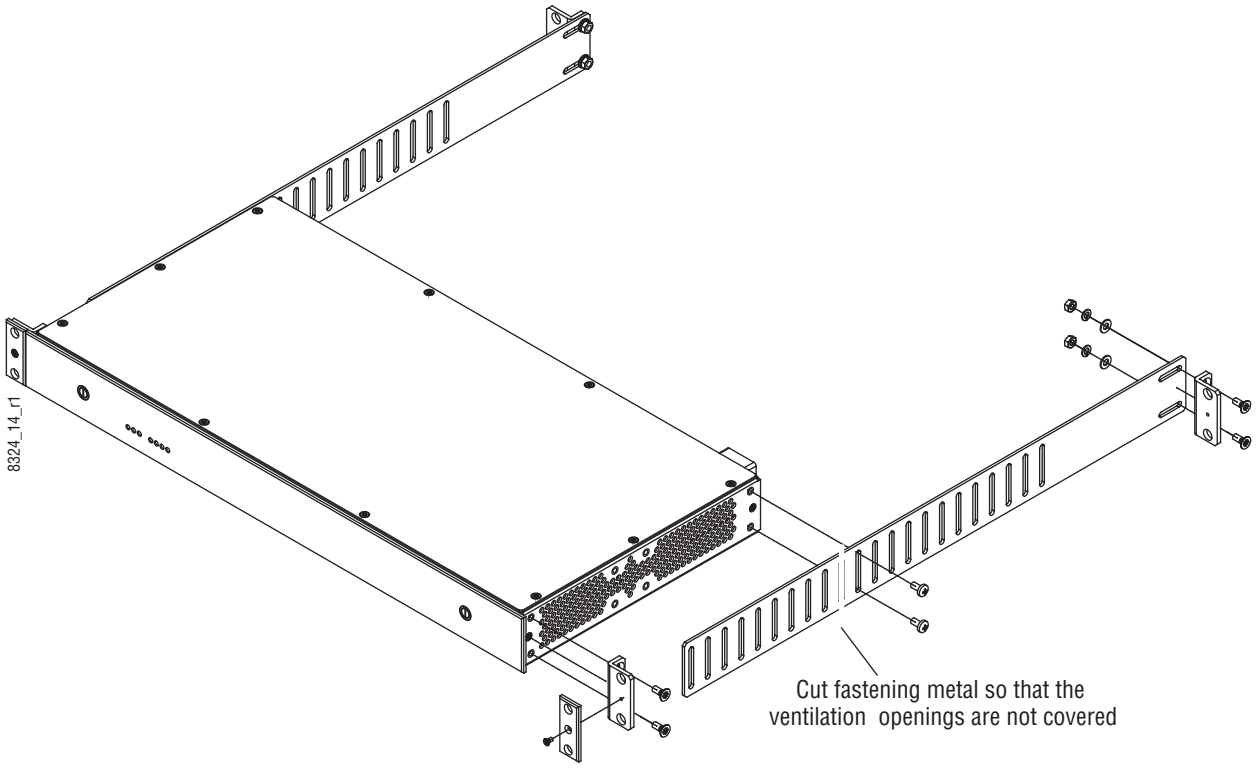


Figure 34. KDD-PSU DC Power Connectors

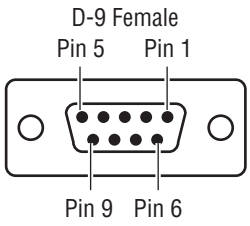
Table 2. KDD-PSU Rear Connectors

Jack	Designation	Note
J1	AC POWER IN	Mains connector (IEC-320, CEE-22) for power supply. Operating Voltage: 100V-240V AC +/-10% wide-range Caution: For continued protection against risk of fire, replace only with same type and rating of fuse. 2x 8A /T H 250V
	AC POWER IN	Power switch
J2	EXT. BATT IN 12V ... 24V DC	Terminal strip for connection to external battery for buffering the RAM-Recorder data.
J3	12V DC OUT	For future use
J4, J5	DC POWER	Two output connectors for DC Power Supply. (High current D-Sub, male). Output voltage: 48V/ total 6A max
	Ground Terminal	Terminal for grounding.

Pin Assignments

RS 422/485 Port

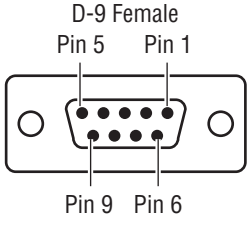
Table 3.

Socket	Pin	Bus Controller	Tributary
	1	Chassis Ground	Chassis Ground
	2	RxA (-)	TxA (-)
	3	TxB (+)	RxB (+)
	4	Signal Ground	Signal Ground
	5	Not used	Not used
	6	Signal Ground	Signal Ground
	7	RxB (+)	TxB (+)
	8	TxA (-)	RxA (-)
	9	Chassis Ground	Chassis Ground

There are 8 RS485 ports that can be used for Machine Control of various devices, or for switcher control by an external controller.

RS 232 Port

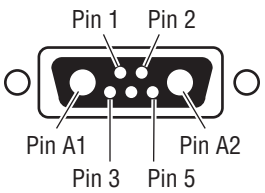
Table 4.

Socket	Pin	Signal
	1	Chassis Ground
	2	Transmit Data
	3	Receive Data
	4	Not used
	5	Signal Ground
	6	Not used
	7	Clear to Send
	8	Request to Send
	9	Not used

There is an RS232 serial port, a keyboard port, and a VGA video output located on front of the Controller Board. These ports are used for diagnostics. If you need to use these ports to diagnose problems with the Kayak HD switcher, please contact your Grass Valley Customer Service Representative.

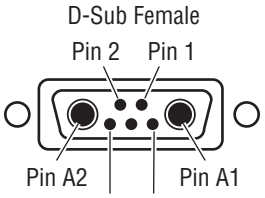
Control Panel DC Power In

Table 5.

Socket	Pin	Signal
	A1	48 V (+)
	A2	48 V (-)
	1	-
	2	-
	3	-
	4	-
	5	-

Frame DC Power Out

Table 6.

Socket	Pin	Signal
	A1	48 V (+)
	A2	48 V (-)
	1	-
	2	-
	3	-
	4	-
	5	-

GPI / Tally Connections

The Kayak HD GPI / Tally system has universal relays that interface source tally and GPI Output information to an external system through the Tally Port connectors. The channels can be assigned in the Setup menu.

Tallies are a source attribute and relays can be assigned to a source when source definitions are defined in the Setup menu during initial system configuration. The nominal rating specification for each relay is 1A, 60 V.

The GPI (General Purpose Interface) and Tally Interface provides a means to transfer commands to and from the switcher to external customer provided equipment. A “one wire per function” parallel hardware connection is used.

Connectors and pins are provided to create a mating connector.

Kayak HD GPI and Tally Interface

The Kayak HD is highly modular and configurable. This document describes various possibilities for tally interconnections.

There are two 50 pin female subminiature 'D' connectors on the rear of the 4 RU Kayak HD frame and four connectors on the rear of the 8 RU Kayak HD frame. Each connector is activated by the presence of a Mix/Effects module installed in the frame. A one M/E switcher (4 RU or 8 RU frame) activates only the first connector. Two M/Yes activate two connectors, and so forth, up to four connectors activated by a four M/E system.

GPI inputs and outputs are assigned as follows:

- GPI in 1 - 8 and GPI/Tally out 1 - 32 routed to the first connector.
- GPI in 9 - 16 and GPI/Tally out 33 - 64 routed to the second connector.
- GPI in 17 - 24 and GPI/Tally out 65 - 96 routed to the third connector (8 RU frame only).
- GPI in 25 - 32 and GPI/Tally out 97 - 128 routed to the fourth connector (8 RU frame only).

For pinouts of these connectors refer to the listings in:

- *4 RU and 8RU Frame Tally (GPI In 1-8, GPI Out 1-32)* *on page 64*
- *4 RU and 8RU Frame Tally (GPI In 9-16, GPI Out 33-64)* *on page 65*
- *8RU Frame Tally (GPI In 17-24, GPI Out 65-96)* *on page 66*
- *8RU Frame Tally (GPI In 25-32, GPI Out 97-128)* *on page 67*

These four connectors do not share any signals in common other than ground reference and chassis ground. Because of this, some GPI / Tally interconnects may require external common connections between connectors, as explained below.

GPI Inputs

The purpose of the GPI In pins is to provide a stimulus from the customer's equipment to the switcher.

A simple connection to the two connectors (or four in the case of the 8 RU frame) activates the corresponding input. This kind of control is suitable for a connection to a relay contact or to an open-collector output.

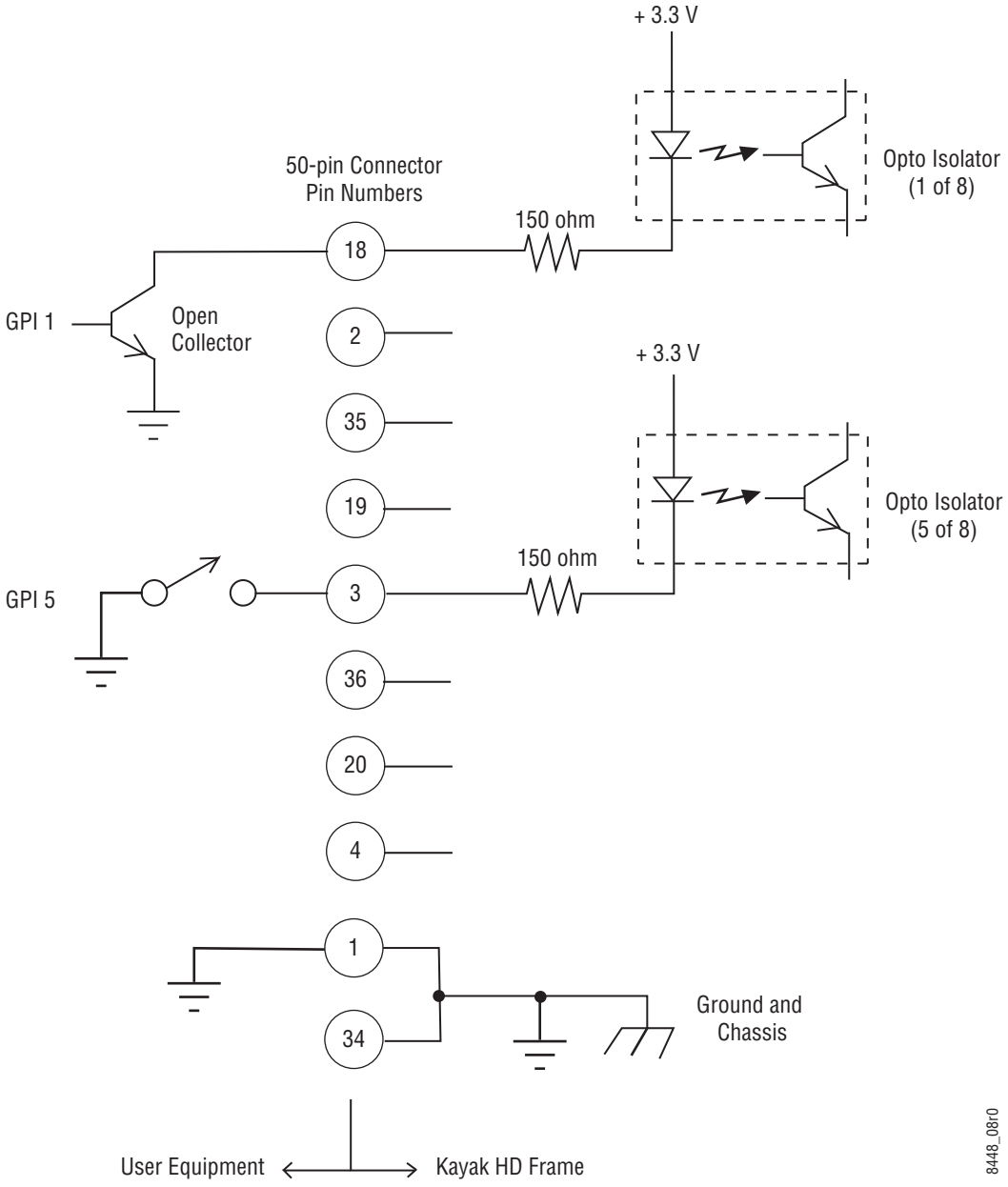
WARNING When connecting to an open-collector output, there is no ground potential isolation between the Video Processor frame and controlling devices.

Since the circuit ground is led out of the device, the cabling has to be shielded for this kind of control. Non-shielded cables may cause EMC and/or ESD problems.

To activate a GPI In you must provide switch closure between a particular GPI In pin and one of the two GPI In Com pins (Pins 1 and 34).

GPI Input Structure

Figure 35. GPI Input Connections (Typical 2 of 8 connections)



Pins 1 and 34 of each of the two (four) connectors are connected to ground. For applications that span across more than one connector, only one ground (common) connection is required.

The function of each GPI input is user assignable. The activation of the function can be programmed to occur on the leading edge or the trailing edge of the closure, or both edges. The switch must be closed for at least one field.

Refer to the *Install Menus* section of the *Kayak HD User Manual* for details on setting the input signal activating edge.

Refer to the *Configuration Menu* section of the *Kayak HD User Manual* for details on setting the function of a GPI input.

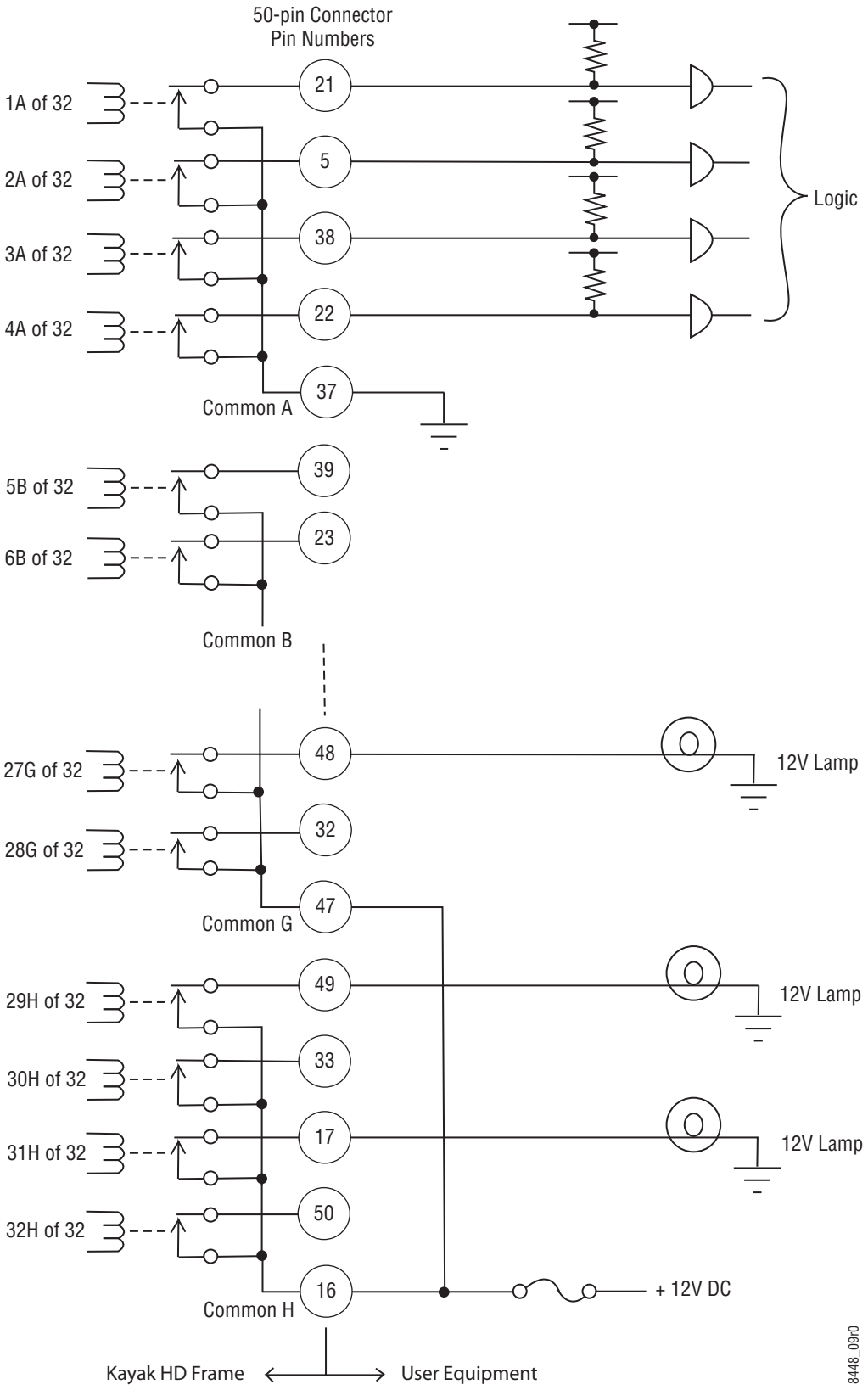
GPI / Tally Outputs

There is a great deal of flexibility in the hardware and programmability of the GPI / Tally outputs.

Outputs are arranged in groups of four. Each group has its own common connection. These are labeled GPI_OUT_COM_A through GPI_OUT_COM_H for the first connector (corresponding to GPI /Tally OUTs 1 - 32). These commons can all be tied together, forming one common bus for all 32 outputs. Alternatively, multiple smaller commons can be constructed to interface with systems that need isolated common connections. This common or isolated bus scheme can extend across multiple connectors. For example, a 4 M/E system could have all commons of all connectors tied together. All 128 relay closures will connect to one common bus. Another case may require two isolated common buses - half of the commons form the first common bus and the other half form the second common bus.

The example in Figure 36 on page 62 shows two common buses. The first four outputs (COMMON A) have the common bus tied to ground. This drives a logic system. The last outputs (COMMON G & COMMON H) have the common bus tied to +12 volts. This drives a tally lamp system.

Figure 36. GPO Tally Connections



Although the diagram above implies mechanical relays, the actual outputs are implemented with solid state relays. Interface specifications are:

Maximum current for any one output: 1 amp AC/DC

Maximum current for any one common: 2 amp AC/DC.

Maximum off (open circuit) voltage between output and common: 60 Volts peak.

Maximum voltage between any point and ground (chassis): 60 Volts peak.

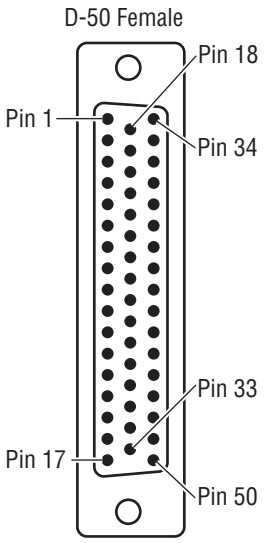
The solid state relays are bidirectional; either polarity voltage can be applied. If the switcher GPI / Tally outputs are used to drive downstream DC relays, be sure to install diodes across the relay coils to clamp inductive spikes. Shielded cable is recommended for the connection from the switcher to the user tally system.

Each output can be programmed for function, steady state or pulse, output polarity, and pulse duration.

Refer to the *Install Menus* section of the *Kayak HD User Manual* for details on setting the characteristics of the output signal (steady state, polarity, pulse duration, etc.).

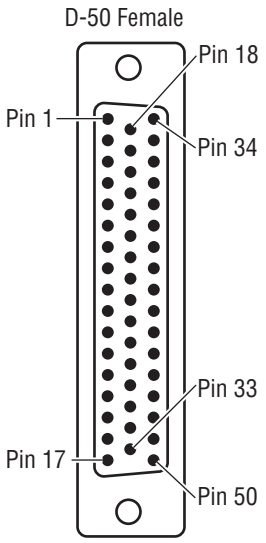
Refer to the *Configuration Menu* section of the *Kayak HD User Manual* for details on setting the function of a GPO / Tally output (tally, auto trans, recall register, and so forth).

4 RU and 8RU Frame Tally (GPI In 1-8, GPI Out 1-32)



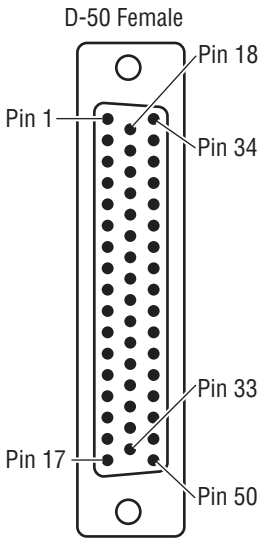
Socket	Ribbon Cable	50-Pin D-Sub			Signal
	1			1	GPIInCom
	2	34			GPIInCom
	3		18		GPIIn1
	4			2	GPIIn2
	5	35			GPIIn3
	6		19		GPIIn4
	7			3	GPIIn5
	8	36			GPIIn6
	9		20		GPIIn7
	10			4	GPIIn8
	11	37			GPIOutComA
	12		21		GPIOut1A
	13			5	GPIOut2A
	14	38			GPIOut3A
	15		22		GPIOut4A
	16			6	GPIOutComB
	17	39			GPIOut5B
	18		23		GPIOut6B
	19			7	GPIOut7B
	20	40			GPIOut8B
	21		24		GPIOutComC
	22			8	GPIOut9C
	23	41			GPIOut10C
	24		25		GPIOut11C
	25			9	GPIOut12C
	26	42			GPIOutComD
	27		26		GPIOut13D
	28			10	GPIOut14D
	29	43			GPIOut15D
	30		27		GPIOut16D
	31			11	GPIOutComE
	32	44			GPIOut17E
	33		28		GPIOut18E
	34			12	GPIOut19E
	35	45			GPIOut20E
	36		29		GPIOutComF
	37			13	GPIOut21F
	38	46			GPIOut22F
	39		30		GPIOut23F
	40			14	GPIOut24F
	41	47			GPIOutComG
	42		31		GPIOut25G
	43			15	GPIOut26G
	44	48			GPIOut27G
	45		32		GPIOut28G
	46			16	GPIOutComH
	47	49			GPIOut29H
	48		33		GPIOut30H
	49			17	GPIOut31H
	50	50			GPIOut32H

4 RU and 8RU Frame Tally (GPI In 9-16, GPI Out 33-64)



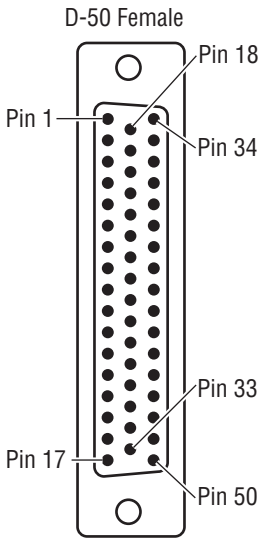
Socket	Ribbon Cable	50-Pin D-Sub			Signal
	1			1	GPIInCom
	2	34			GPIInCom
	3		18		GPIIn9
	4			2	GPIIn10
	5	35			GPIIn11
	6		19		GPIIn12
	7			3	GPIIn13
	8	36			GPIIn14
	9		20		GPIIn15
	10			4	GPIIn16
	11	37			GPIOutComJ
	12		21		GPIOut33J
	13			5	GPIOut34J
	14	38			GPIOut35J
	15		22		GPIOut36J
	16			6	GPIOutComK
	17	39			GPIOut37K
	18		23		GPIOut38K
	19			7	GPIOut39K
	20	40			GPIOut40K
	21		24		GPIOutComL
	22			8	GPIOut41L
	23	41			GPIOut42L
	24		25		GPIOut43L
	25			9	GPIOut44L
	26	42			GPIOutComM
	27		26		GPIOut45M
	28			10	GPIOut46M
	29	43			GPIOut47M
	30		27		GPIOut48M
	31			11	GPIOutComN
	32	44			GPIOut49N
	33		28		GPIOut50N
	34			12	GPIOut51N
	35	45			GPIOut52N
	36		29		GPIOutComP
	37			13	GPIOut53P
	38	46			GPIOut54P
	39		30		GPIOut55P
	40			14	GPIOut56P
	41	47			GPIOutComQ
	42		31		GPIOut57Q
	43			15	GPIOut58Q
	44	48			GPIOut59Q
	45		32		GPIOut60Q
	46			16	GPIOutComR
	47	49			GPIOut61R
	48		33		GPIOut62R
	49			17	GPIOut63R
	50	50			GPIOut64R

8RU Frame Tally (GPI In 17-24, GPI Out 65-96)



Socket	Ribbon Cable	50-Pin D-Sub			Signal
	1			1	GPIInCom
	2	34			GPIInCom
	3		18		GPIIn17
	4			2	GPIIn18
	5	35			GPIIn19
	6		19		GPIIn20
	7			3	GPIIn21
	8	36			GPIIn22
	9		20		GPIIn23
	10			4	GPIIn24
	11	37			GPIOutComS
	12		21		GPIOut65S
	13			5	GPIOut6S
	14	38			GPIOut67S
	15		22		GPIOut68S
	16			6	GPIOutComT
	17	39			GPIOut69T
	18		23		GPIOut70T
	19			7	GPIOut71T
	20	40			GPIOut72T
	21		24		GPIOutComU
	22			8	GPIOut73U
	23	41			GPIOut74U
	24		25		GPIOut75U
	25			9	GPIOut76U
	26	42			GPIOutComV
	27		26		GPIOut77V
	28			10	GPIOut78V
	29	43			GPIOut79V
	30		27		GPIOut80V
	31			11	GPIOutComW
	32	44			GPIOut81W
	33		28		GPIOut82W
	34			12	GPIOut83W
	35	45			GPIOut84W
	36		29		GPIOutComX
	37			13	GPIOut85X
	38	46			GPIOut86X
	39		30		GPIOut87X
	40			14	GPIOut88X
	41	47			GPIOutComY
	42		31		GPIOut89Y
	43			15	GPIOut90Y
	44	48			GPIOut91Y
	45		32		GPIOut92Y
	46			16	GPIOutComZ
	47	49			GPIOut93Z
	48		33		GPIOut94Z
	49			17	GPIOut95Z
	50	50			GPIOut96Z

8RU Frame Tally (GPI In 25-32, GPI Out 97-128)



Socket	Ribbon Cable	50-Pin D-Sub			Signal
	1			1	GPIInCom
	2	34			GPIInCom
	3		18		GPIIn25
	4			2	GPIIn26
	5	35			GPIIn27
	6		19		GPIIn28
	7			3	GPIIn29
	8	36			GPIIn30
	9		20		GPIIn31
	10			4	GPIIn32
	11	37			GPIOutComAA
	12		21		GPIOut97AA
	13			5	GPIOut98AA
	14	38			GPIOut99AA
	15		22		GPIOut100AA
	16			6	GPIOutComAB
	17	39			GPIOut101AB
	18		23		GPIOut102AB
	19			7	GPIOut103AB
	20	40			GPIOut104AB
	21		24		GPIOutComAC
	22			8	GPIOut105AC
	23	41			GPIOut106AC
	24		25		GPIOut107AC
	25			9	GPIOut108AC
	26	42			GPIOutComAD
	27		26		GPIOut109AD
	28			10	GPIOut110AD
	29	43			GPIOut111AD
	30		27		GPIOut112AD
	31			11	GPIOutComAE
	32	44			GPIOut113AE
	33		28		GPIOut114AE
	34			12	GPIOut115AE
	35	45			GPIOut116AE
	36		29		GPIOutComAF
	37			13	GPIOut117AF
	38	46			GPIOut118AF
	39		30		GPIOut119AF
	40			14	GPIOut120AF
	41	47			GPIOutComAG
	42		31		GPIOut121AG
	43			15	GPIOut122AG
	44	48			GPIOut123AG
	45		32		GPIOut124AG
	46			16	GPIOutComAH
	47	49			GPIOut125AH
	48		33		GPIOut126AH
	49			17	GPIOut127AH
	50	50			GPIOut128AH

Cabling Overview

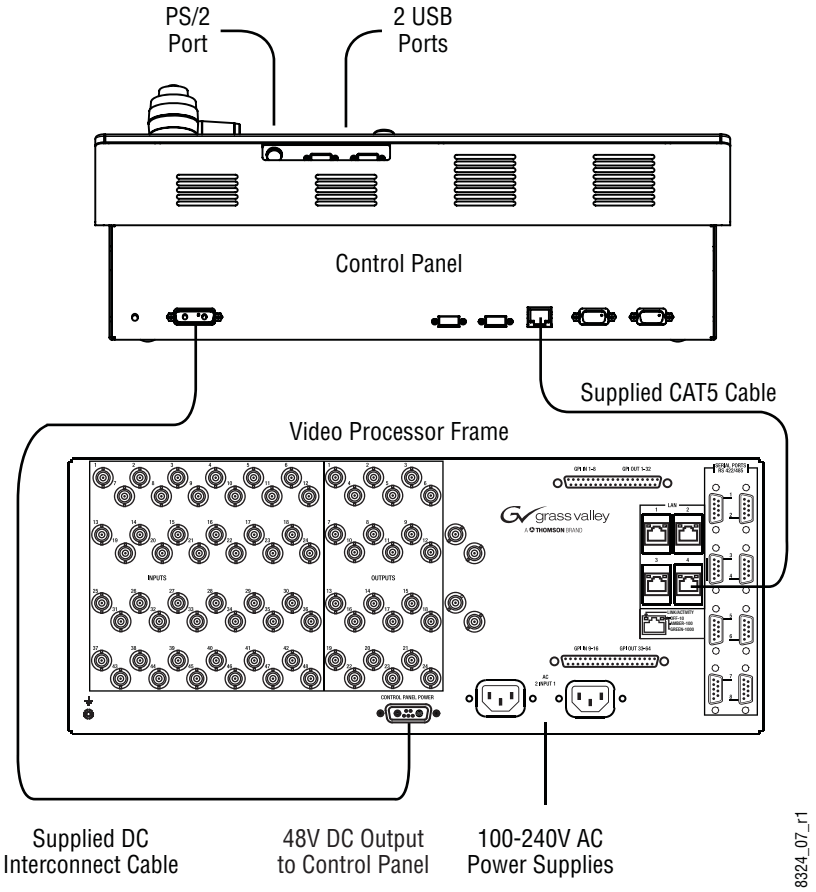
The Kayak HD system uses Ethernet, serial, and USB connections. Tally and GPI I/O (General Purpose Interface Input/Output) control are also available. A simple Kayak HD system consisting of a Control Panel and Video Processor frame does not require connection to an external Ethernet Local Area Network (LAN). The video processor frame incorporates an Ethernet switch for this purpose.

There are two AC power supply inputs to the frame. If the redundant power supply option is installed, power can be provided by one or both line cords to two different AC circuits.

Control Cabling

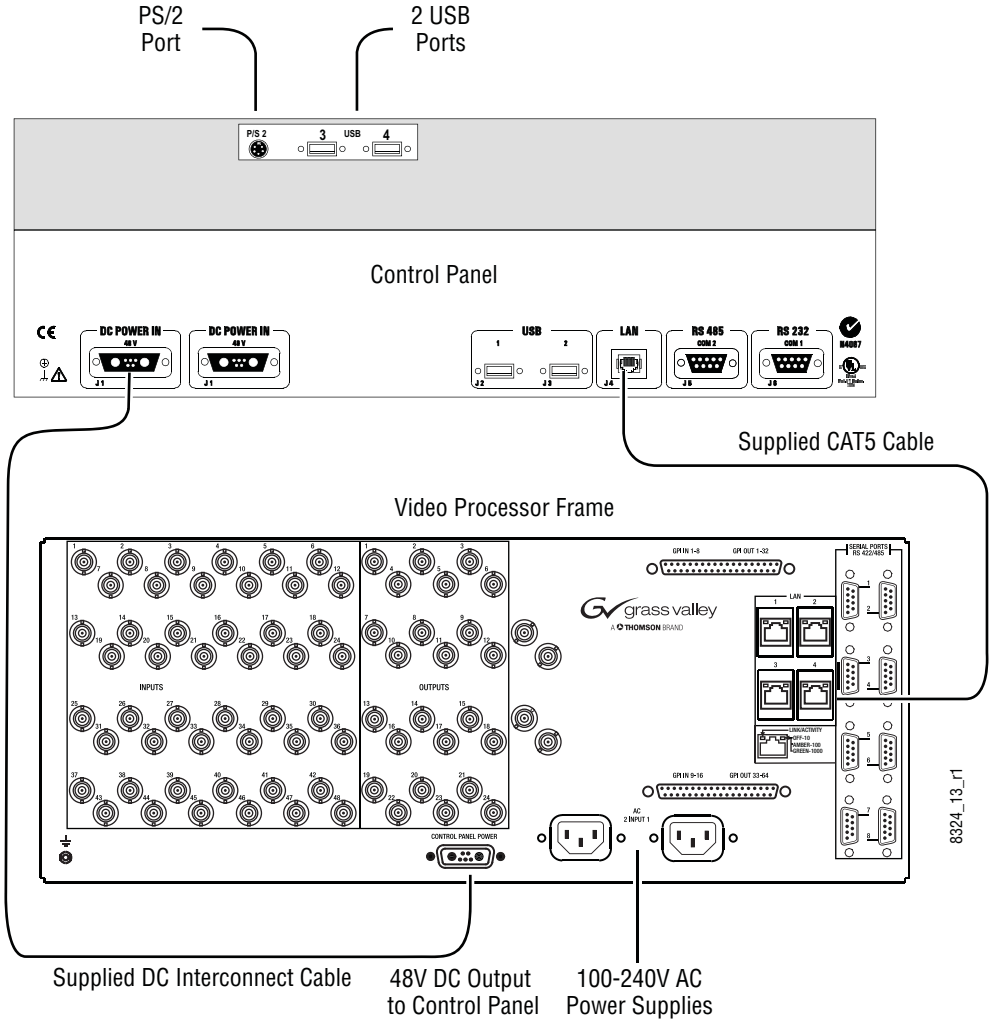
Kayak HD 100C Control Cabling

Figure 37. Kayak HD 100C Standard Control Cabling



Kayak HD 150C, 200C,and 200 Control Cabling

Figure 38. Kayak HD 150C, 200C, and 200 Standard Control Cabling



Mouse Connection

A standard PS/2 mouse can be connected to the rear of the control panel if desired. Be sure to power down before installing the mouse.

Ethernet Switches and Hubs

A Kayak HD system requires a LAN when components other than a Control Panel and Video Processor frame are connected, or when external network access to a file system is desired. An appropriately-sized Ethernet switch may be required. An existing facility Ethernet switch (not hub) can support Kayak HD if an adequate number of ports are available.

A hub can be used only if there is a need to exceed 328 ft. (100 m) between a Control Panel and Video Processor frame. If a hub is used, connect the hub to the switch via the Uplink port, or through a peer-to-peer crossover cable.

Table 7 details Ethernet specifications. All Ethernet components are to be supplied by the customer except the CAT5 crossover cable provided

Note The supplied crossover cable works with the Kayak HD switcher because the frame has an auto-sensing Ethernet switch.

Table 7. Ethernet Specifications

Cables	**Type**	10BaseT and 100BaseT compatible. Category 5 cable, 8 conductor twisted pair. The system will work at 10BaseT with reduced performance. 100BaseT components are highly recommended.
	Connectors	RJ-45 male connector at each end of cable.
	Length	10BaseT: 984 ft. (300 m) maximum. 100BaseT: 328 ft. (100 m) maximum. 1000BaseT: 328 ft. (100 m) maximum. Use hub or switch to exceed maximum cable runs.
Switch	**Speed**	10/100/1000 Mbps
	Ports	RJ-45 auto-negotiating 10/100/1000 Mbps; number of ports required is dependent upon system size. Frame ports are capable of 1000 Mbps. Using a 1000 Mbps Ethernet switch enhances RAM Recorder transfer speeds.
	Unmanaged	Recommended. Configuration not required, but does not provide remote monitoring capability.
	Managed	May be used. Requires configuration, but offers remote monitoring capability.

CAUTION An existing facility Ethernet switch (not hub) can support Kayak HD if an adequate number of ports are available. Keep your facility network and technical network separate in order to avoid network traffic negatively affecting Kayak HD system operation.

The Kayak HD backplane has four RJ45 Ethernet connectors for its built-in Ethernet switch, each capable of 10/100/1000 Mbps. All Ethernet connectors share the same speed- and direction-sensing features.

One Ethernet connector must connect to the Control Panel. It may go through a switch to make the Control Panel connection, but at least one connector must be connected from the Frame to the Control Panel somehow.

One Ethernet connector may be connected to the Facility LAN if desired. The other two Ethernet connectors may be connected to other devices if needed.

Note If you do connect these extra Ethernet connectors to other devices, please note that these other devices will not communicate if the switcher frame is turned off for any reason. For that reason, it is preferable to connect Ethernet ports coming from the switcher only to other devices that are switcher-related.

Factory Network Settings

The default factory setting for the IP address is

- 192.168.0.70 for the video processor frame
- 192.168.0.73 for the control panel

The Device Setup menu allows you to change the IP address. It is only allowed to change the last octet of the IP address (to accommodate Kayak HDs on the same network).

For complete instructions on changing network settings please refer to *Network Settings* *on page 88* and to *Network Settings - Telnet* *on page 90*.

Note In order to integrate Kayak HD devices into an existing network, ask the local network administrator for the subnet mask of the network. Before changing IP addresses always set the subnet masks of the Kayak HD devices to the mask of the local network. If all changes are made and a frame is not visible to the panel, press **Rescan** in the **Device Control** menu of the panel.

Video Cabling for all Kayak HD Switchers

All Kayak HD system video inputs and outputs are configurable. For cabling configuration flexibility, each external primary input can be mapped to any Kayak HD panel source select button, as can each internal video system source. Any Kayak HD system video signal, such as M/E Program (PGM), Preset (PST), clean feed (CLNFD), or Preview (PVW) can be mapped to any output bus to be accessed on a specific connector, or an output bus can act as an AUX bus.

Inputs

Non-looping video inputs on the back of the Video Processor frame are numbered 1 through 24 and 25 through 48 on the 4 RU frame. Each accepts a 270 MHz serial digital video signal, or 1.485 Gb. The number of inputs that are active depends on the number of full mix/effects (or I/O Expansion modules when available) that are installed in the chassis. There are 24 inputs active for every mix/effects module and expansion module installed.

Outputs

The outputs on the back of the Video Processor frame are numbered 1 through 12 and 13 through 24 on the 4RU frame. All of the outputs carry the same video format, as determined by standard selected and by the reference signals connected. The number of outputs that are active depends on the number of full mix/effects (or I/O Expansion modules when available) installed in the chassis. There are 12 outputs active for every mix/effects and expansion module installed.

Reference Input

There are two separate, looping reference input pairs. The upper pair accepts analog 525 or 625 composite video. Burst is not required, but typically facility reference color black is used. Kayak HD can auto-sense whether the reference is 525 or 625 and can change the internal standard accordingly.

The lower looping reference input pair is for HD production and uses analog tri-level sync.

75-ohm termination of one of each of these looping inputs is required, either directly on the adjacent connector or at the end of a daisy chain looping to other equipment.

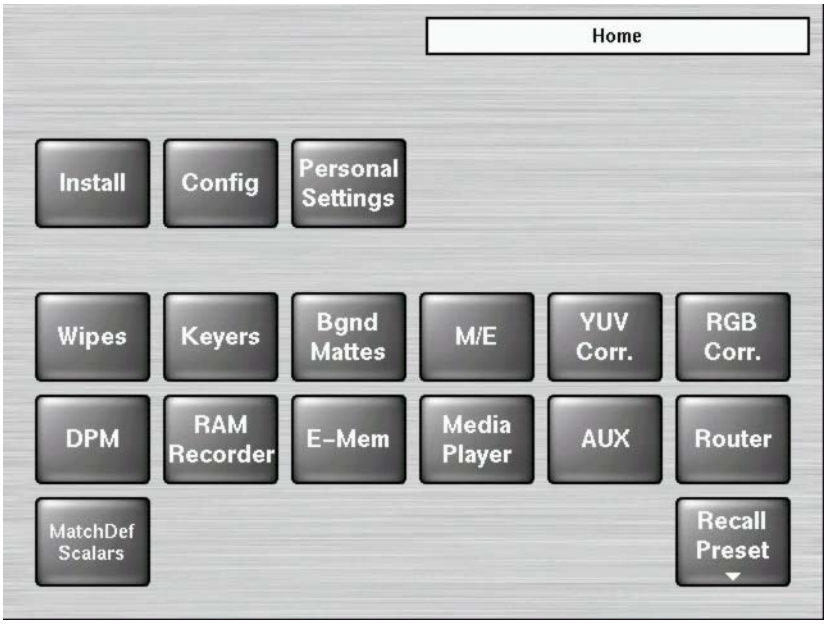
Any one of the SDI inputs can also be used as reference in the respective standard.

Kayak HD Video Timing

Kayak HD Home - Install Menu

1. To begin setting the Video Timing for the Kayak HD switcher press the Home key on the switcher control panel to go to the **Home** menu on the Kayak HD switcher menu screen.

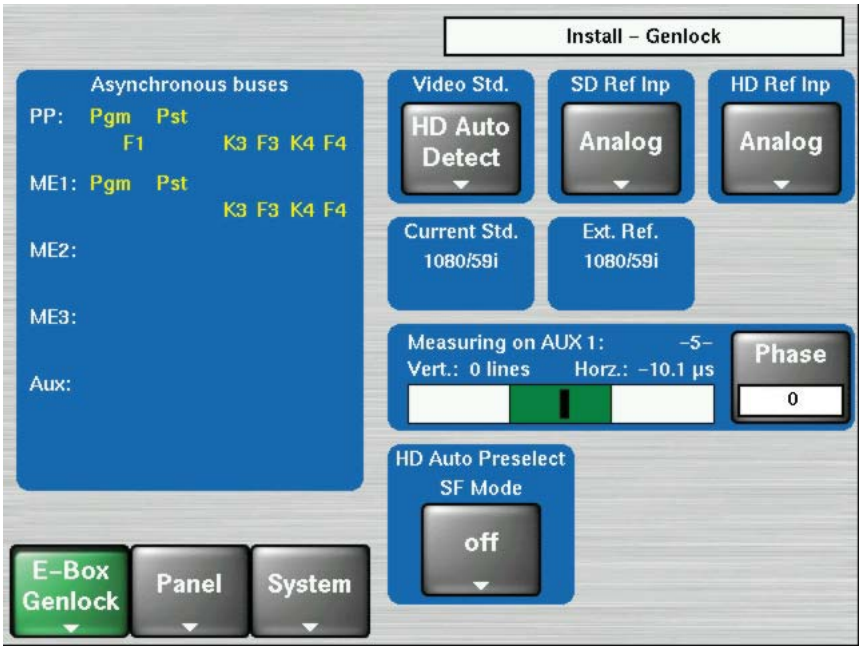
Figure 39. Kayak HD Home Menu



2. Press the **Install** button in the upper left-hand corner of the menu.

3. Press the **E-Box Genlock** button to display the **Genlock** menu. The **Genlock** menu reports the status of the Kayak HD system sync generator. It is used to switch between HD and SD operating modes and to adjust the internal system timing.

Figure 40. Genlock Menu with Video Signal in Green Legal Timing Window



The three buttons on the upper right-hand side of the **Genlock** Menu affect video timing. These buttons are primarily used by Engineering when setting up the switcher.

- The first button is located in the **Video Std.** data pad (shown as **HD Auto Detect** in Figure 40). This button selects the Video Standard that you want to use for the Kayak HD switcher. Press this button to display a list of the possible video standards, including **HD Auto Detect** and **SD Auto Detect**. Select the video standard you want to use for the switcher.
- The second button is in the **SD Ref Inp.** data pad (shown as **Analog** in Figure 40). This button is used to select the SD (Standard Definition) Reference source which can be either the SD Analog Reference or any one of the serial digital video inputs to the switcher. The digital input must match the video standard that the switcher is running (the one you selected from the **Video Std.** data pad).
- The third button is in the **HD Ref Inp.** data pad (shown as **Analog** in Figure 40). This button is used to select the HD (High Definition) Reference Input video source which can be either the HD Analog Reference or any one of the serial digital video inputs to the switcher. The digital input must match the video standard that the switcher is running (the one you selected from the **Video Std.** data pad).

There are two displays showing the Current Standard and External Reference settings that have been selected for your switcher:

- The currently selected video standard is reported in the **Current Std.** field in the middle of the **Genlock** menu.
- The incoming reference signal rate is reported in the **Ext. Ref.** field (to the right of the **Current Std.** field).

If you are using **Auto Detect** the video standard you have selected persists until a different video standard is detected and locked for use by the switcher.

If the reference signal is temporarily lost, the Kayak system will continue using the previous reference standard and a **NONE** status will be reported.

Note The Kayak HD cannot support both SD and HD at the same time; you must choose one mode or the other. If you change the mode from SD to HD (or vice versa) then the Kayak HD hardware must reprogram itself to process the change. This takes a minute, but you only have to do it when changing from HD to SD, or from SD to HD.

The Asynchronous buses window in the upper left of the **Genlock** menu shows an overview of the buses for the entire switcher:

- PP
- ME1
- ME2
- ME3
- AUX

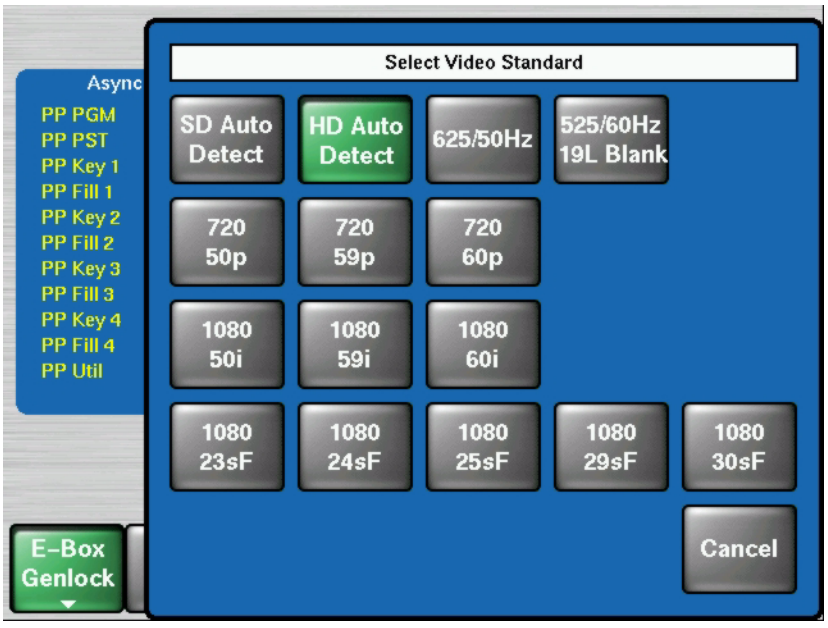
If any bus is displayed in the **Asynchronous buses** window that means that the bus input is not in sync and the timing for its video sources must be re-adjusted.

Select the Video Standard

1. At the top of the **Genlock** menu press the button shown in the **Video Std.** data pad. The **Select Video Standard** menu displays.

Note In Figure 41 the button is displayed as **HD Auto Detect**, but a different video standard may be selected on your switcher.)

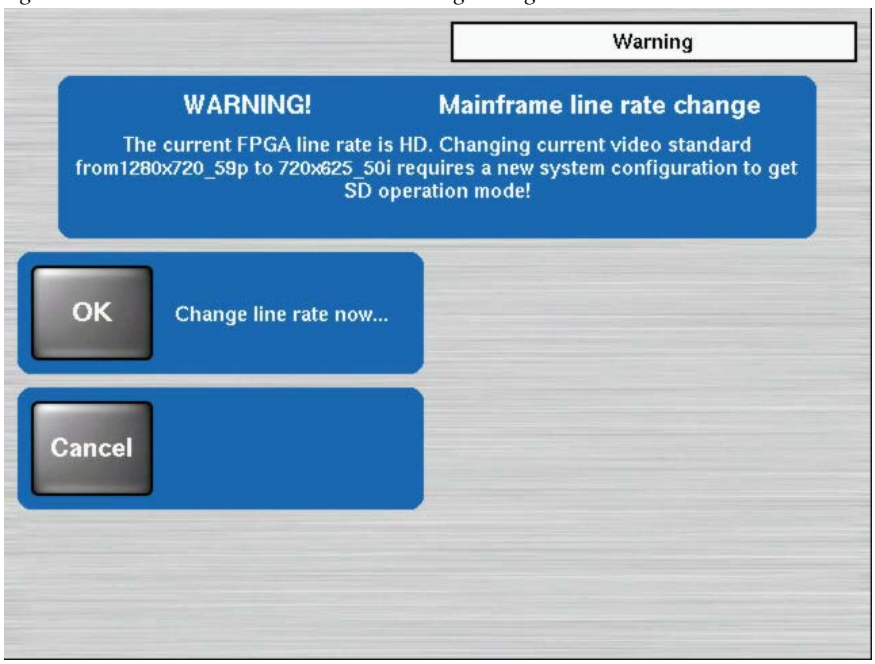
Figure 41. Select Video Standard Menu



2. Press to select the video standard you wish to use for the Kayak HD switcher. If you select either **SD Auto Detect** or **HD Auto Detect** the Kayak HD system will automatically determine the appropriate video standard to apply for your switcher based on the external reference.

3. After selecting a new video standard a Warning dialog box asks you to confirm the change of the current video standard.

Figure 42. Install Genlock Menu with Warning Dialogs

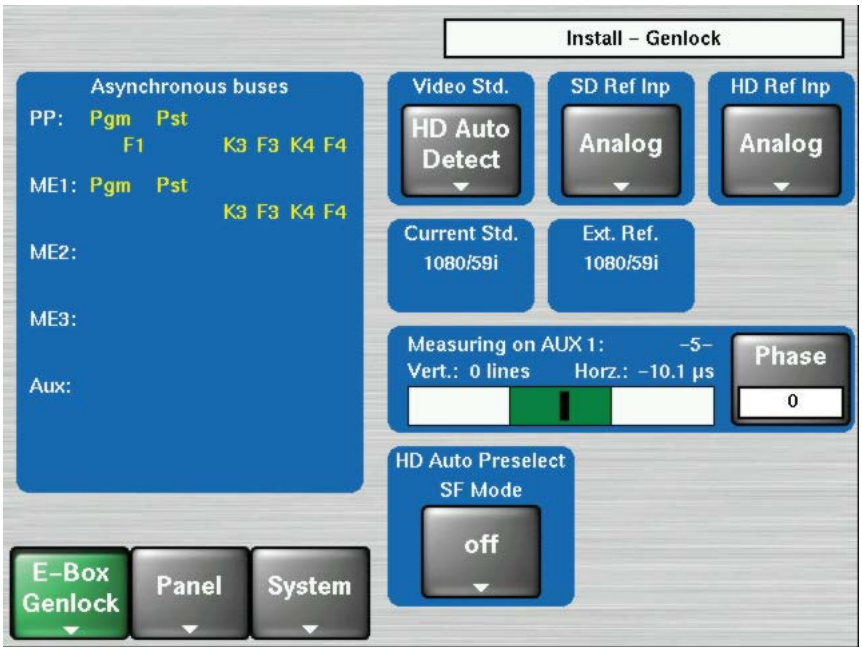


4. After you select a video standard the **Genlock** menu displays.

Select the Video Reference Source

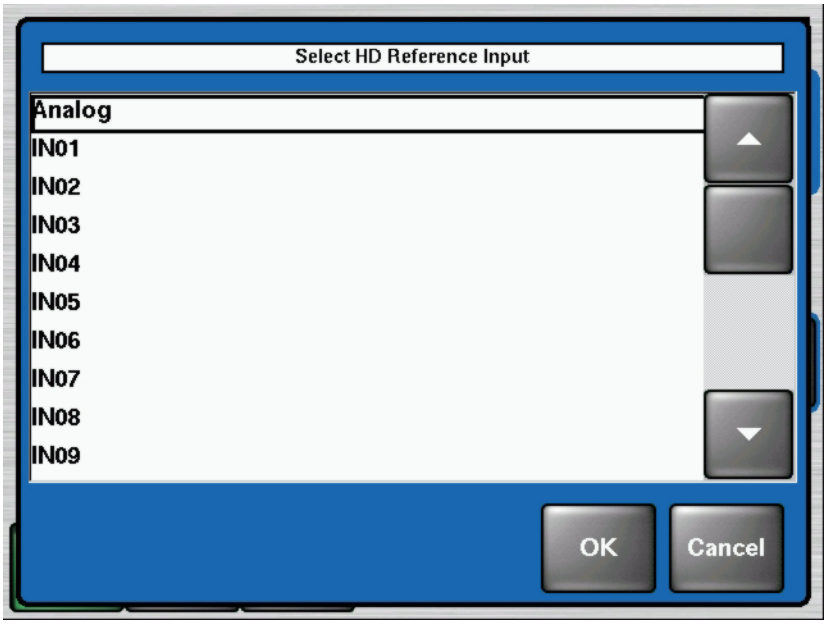
1. At the top right of the **Genlock** menu press the button shown in the **HD Ref Inp** data pad. The **Select HD Reference** Input menu displays a scrolling list of HD Reference Inputs from which to choose.

Figure 43. Genlock Menu



Note In Figure 43 the **HD Ref Input** button displayed reads **Analog**, but your switcher may be using a different HD Reference signal.

Figure 44. Select HD Reference Input Menu



2. Press on the arrows to scroll through the list. Press to select the name of the HD Reference Input signal you want to use. These signals correspond to video inputs associated with the physical inputs on the back of the Kayak HD frame.

Select SF Mode

The Kayak HD system supports 1080sf (segmented frame) video formats at 23.9, 24, 25 and 30 fps. Segmented frame video captures a frame of video progressively, but displays the frame as two interlaced fields.

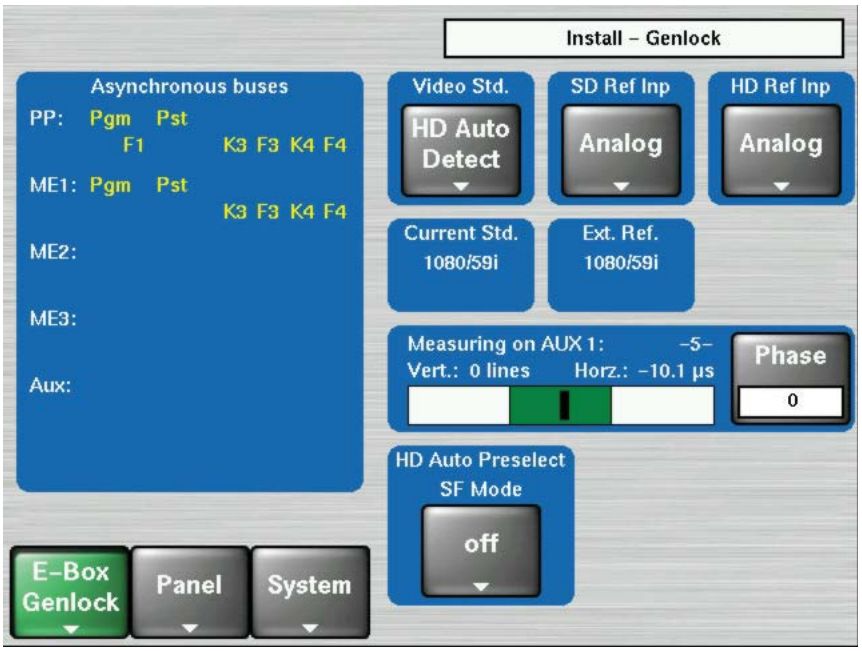
This can give a slightly different look to the resulting video playback. Interlaced and segmented frame video requires different internal system video processing techniques. These include changes to crosspoint cut points, wipe pattern geometry, and interpolation.

When using **Auto Detect** the Kayak system automatically detects the line and frame rate of the incoming video reference signal and reports its sync reference status on the menu. However, the system cannot always directly determine whether the incoming video is interlaced or segmented frame. If HD Auto Detect is selected as the video standard you must set the SF Mode manually for some rates.

Because 1080-24/23.9 fps video is only produced in segmented frame, the system always uses segmented frame processing whenever it operates with a 1080-24/23.9 fps sync signal.

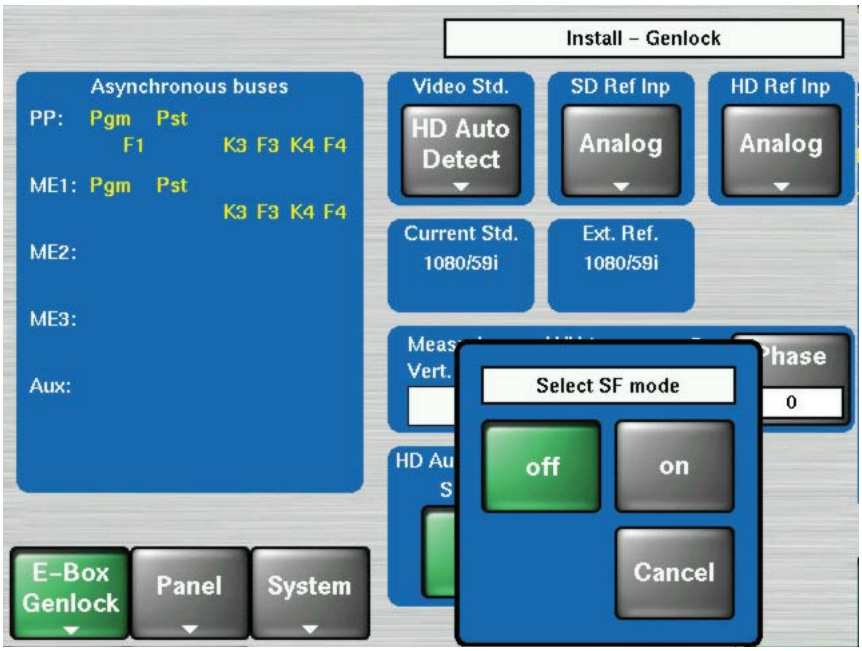
To select the SF mode for the Kayak HD switcher:

Figure 45. Genlock Menu with HD Auto Preselect SF Mode Data Pad



1. From the bottom of the **Genlock** menu press the button located in the **HD Auto Preselect SF Mode** data pad (shown in Figure 45 as set to **off**). The **Select SF mode** dialog box displays.

Figure 46. Genlock Menu with Select SF Mode



2. Press to select either **off** or **on** to set the SF video format for your Kayak HD switcher.

Adjust Internal System Timing

The Genlock Phase Knob (located to the right of the menu screen) adjusts/moves the switcher's internal system timing with respect to the selected reference. Adjusting the Phase affects the phase of all inputs and outputs of the switcher with respect to the external reference.

Grass Valley recommends that you use the AUX1 bus to check the video timing of all inputs. This compares the video source selected on the AUX1 bus to the switcher's internal system timing.

One method to determine the correct system timing phase is to select a source on the AUX1 bus and then adjust the switcher's phase to center the source in the timing window. Record this phase setting. Repeat this process for all external video sources.

Note Internal video sources cannot be measured and do not show up in the measurement window when selected.

Find the average Phase value by adding the highest and lowest Phase numbers together and then divide by two.

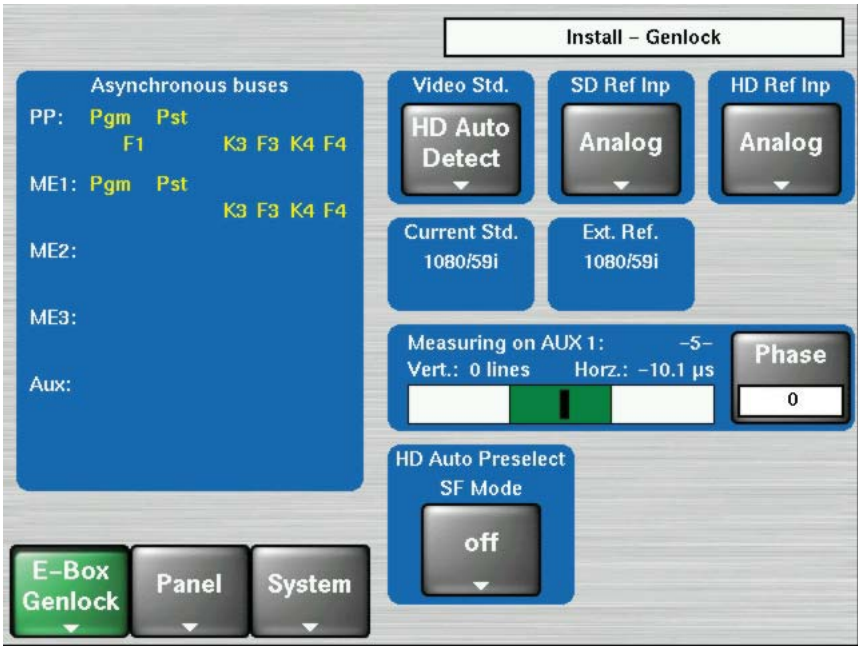
Now recheck all sources with the new average Phase number. Fine tune the Phase adjustment if necessary.

There may be some sources that still do not fall within the legal timing window. For these sources you will have to go back to the video source itself and change its timing with respect to reference until it appears within the legal timing window.

To adjust the Internal System Timing on the Kayak HD:

1. Press the **Home** button on the Kayak HD Control Panel.
2. On the menu screen press the **Install** button.

Figure 47. Genlock Menu with Legal Timing Source



3. Press the **E-Box Genlock** button at the bottom left-hand corner of the screen. The **Genlock** menu displays.

Note The **E-Box** button displays the name of the current **Install** menu. If the **Genlock** menu is not displayed, press the **E-Box** button and select **Genlock**.

4. On the Kayak HD control panel press a key to select a video source from the AUX 1 bus. You need to check all video sources for timing.

5. Observe the vertical black cursor in the timing window to see how the source you have selected compares with the internal system timing.

   Now adjust the internal system timing by physically turning the **Genlock Phase Knob** located to the right of the menu screen, third knob from the top. This adjusts the switcher sync in relation to the Reference you have selected.

   Turn the **Genlock Phase Knob** to position the vertical black cursor as close as possible to the middle of the green legal timing window. The vertical black cursor must be in the green and not moving.

   Position the black cursor (representing the timing for the video source you have selected for AUX 1) near the center of the legal timing window. (See Figure 47.) Green indicates that the source is within legal timing and yellow means that the source is outside legal timing window limits (Figure 48).

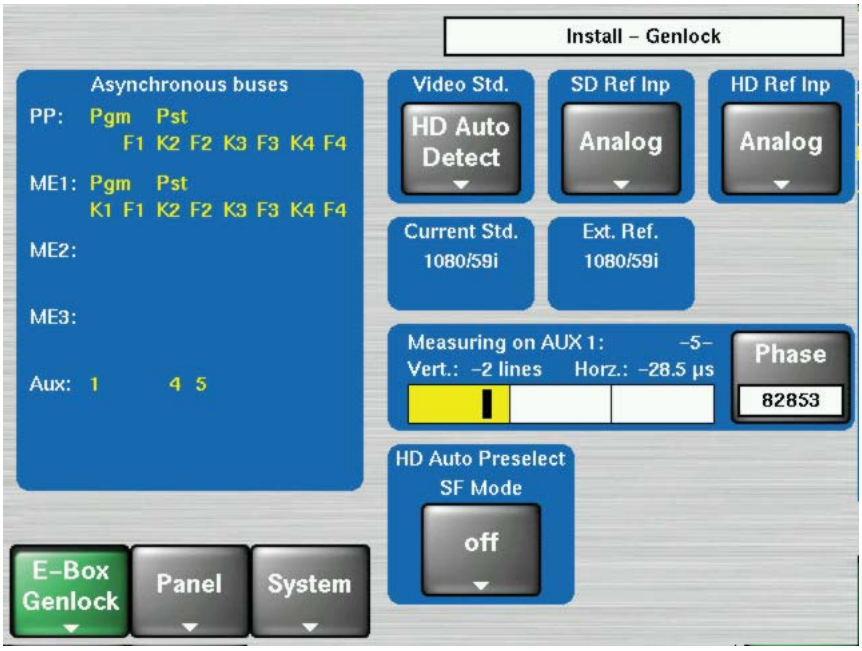
   The text in the Phase button to the right of the Timing Window displays the timing phase in pixels.

6. Write down the Phase number for each source to help determine the average Phase number for all sources.

7. Once you have checked the timing for the first video source you selected from the AUX1 bus, you must repeat the process for every other video source on the AUX1 bus. Select all video sources and record their Phase number.

8. Find the average Phase value by adding the highest and the lower Phase numbers together and then divide by two.

Figure 48. Genlock Menu with Illegal Timing Source



9. Now set the Phase as close as possible to the average number.

10. Recheck all video sources on AUX1 for timing. Fine tune the Phase adjustments if necessary.

    There will always be a few video sources that may be out of legal timing range, even after you have adjusted the switcher for the best average timing for all sources. In that case, you need to go to the video source itself and adjust its timing.

11. Check the Asynchronous buses display. If any buses are displayed or blinking, that bus input is not in sync and the timing for its video sources must be re-adjusted.

CAUTION If you change the Video Standard setting in the **Genlock** menu, you must go back and check the timing for all video sources once again.

Note If you add additional M/Es to your switcher you must also recalibrate your video timing to make sure all sources are within the new smaller green legal timing window.

Main Panel Adjustments

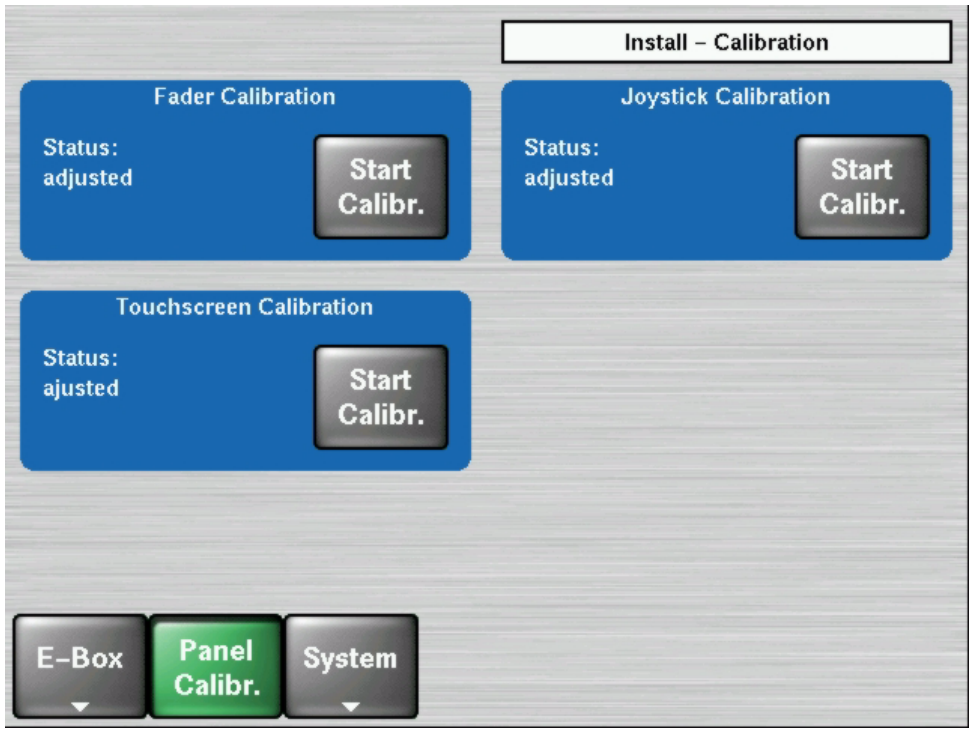
Panel adjustments generally are not required, but may be necessary on some systems.

Install - Calibration Menu

To calibrate the fader(s), joystick and touchscreen on your Kayak system:

1. From the **Home** menu screen press the **Install** button.
2. Press **Panel**. The **Panel Setup** menu displays.
3. Press **Calibr.** The **Install-Calibration** menu displays.

Figure 49. Install - Calibration Menu



Fader Calibration

In the Fader Calibration data pad press the **Start Calibr.** button and follow the instructions:

1. Move all faders to the upper position and press **OK**.
2. Move all faders to the lower position and press **OK**.

   The data pad will indicate that the Status is **adjusted** when done.

Joystick Calibration

In the Joystick Calibration data pad press the **Start Calibr.** button and follow the instructions:

1. Move the joystick to the bottom right corner, twist it to the left stop position, and press **OK**.
2. Let the joystick return to the center position and press **OK**.
3. Move joystick to the top left corner, twist to right stop and press **OK**.

   The data pad will indicate that the Status is **adjusted** when done.

Touch Screen Calibration

To open the **Touchscreen Calibration** menu:

1. From the Kayak HD **Home** menu press **Install**. The **Touchscreen Calibration** data pad displays on the screen.

   If the **Touchscreen Calibration** data pad is not displayed at first, touch the **Panel Misc.** button at the bottom of the screen, then touch **Calibr.**

   You can also use the following shortcut:

   Menu Lock + User 3

2. In the **Touchscreen Calibration** data pad touch the **Start Calibr.** button.
3. The **Touchscreen Calibration** menu displays a simple set of instructions explaining how to calibrate the touch screen. You are asked to touch a red dot in three corners of the menu screen so that the system can optimize the touch screen display.

Note If the touch screen is so far out of calibration that you cannot call up the **Touchscreen Calibration** data pad using the **Menu Lock + User 3** commands, plug in a USB mouse to one of the two active panel USB connectors (USB Port2 2 and 4). This allows you to press the correct buttons (using the mouse) to use the procedure described above in *Touch Screen Calibration* to call up the **Touchscreen Calibration** data pad. Once you can see the **Touchscreen Calibration** data pad you should be able to perform the calibration procedure using your finger or a stylus.

Kayak System Control via PC

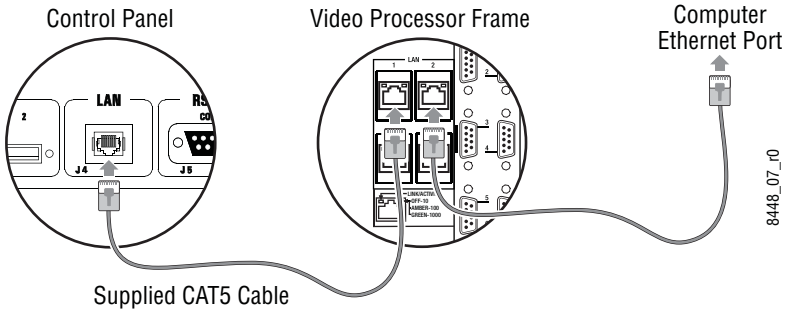
Connecting a PC / Laptop to a Kayak HD System

To connect a computer to the Kayak HD you will need:

- Laptop or desktop computer with an available Ethernet port
- 2 Ethernet Cables (1:1)

Connect the computer, frame, and the Kayak HD Panel as shown in Figure 50.

Figure 50. Connecting a Computer to the Kayak HD



Configure your computer to connect to the Kayak HD by specifying the IP address for your computer using this format:

IP Address `192.168.0.xxx`

Subnet Mask: `255.255.255.0`

To set the Identification for your computer and workgroup change your Network Properties to reflect your computer name and workgroup (if required).

Section 3

Configuration

Introduction

This section provides system configuration information for the Kayak HD Digital Production Switcher. Refer to the latest *Kayak HD Release Notes* for additional information specific to your current software version.

Basic Configuration Steps

Kayak HD system configuration includes the following basic steps:

1. Ensure devices are configured properly on the network (IP addresses).
2. Ensure the latest software is installed on all Kayak system components. The current software is pre-installed on new systems at the factory, but updates may have subsequently been released.
3. Check the proper software option license authorizations are present.
4. Map sources to control panel buttons and name the sources.
5. Define the Kayak system outputs.
6. Define tally behavior associated with the Kayak outputs.
7. Backup your configuration files so they can be reloaded if necessary.
8. Install the Sidepanel software on a PC or laptop computer to access advanced system configuration functions.

Setting Up IP Addresses

Network Settings

The Kayak HD switcher communicates with other devices over an Ethernet network. When connecting new devices you may wish to configure their network settings.

Note If you are experiencing problems with the network settings for your switcher, please refer to the section on *Troubleshooting and Diagnostics* *on page 146*.

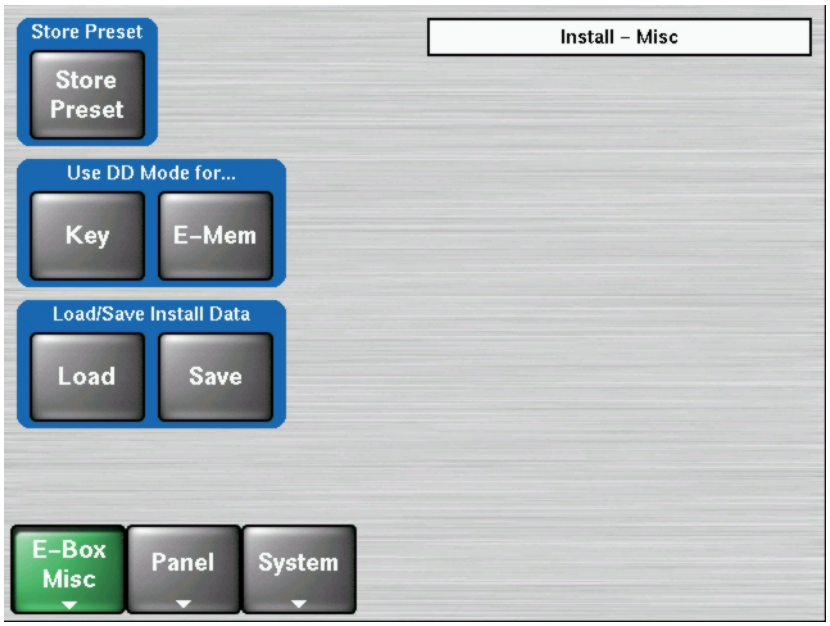
IP Address

An IP (Internet Protocol) address is a 32-bit number that uniquely identifies each device sending or receiving information in packets across the Internet. It is used so that two devices can communicate with each other, as well as with other devices connected to the same network.

To set the IP address for a device using the Kayak control panel menu:

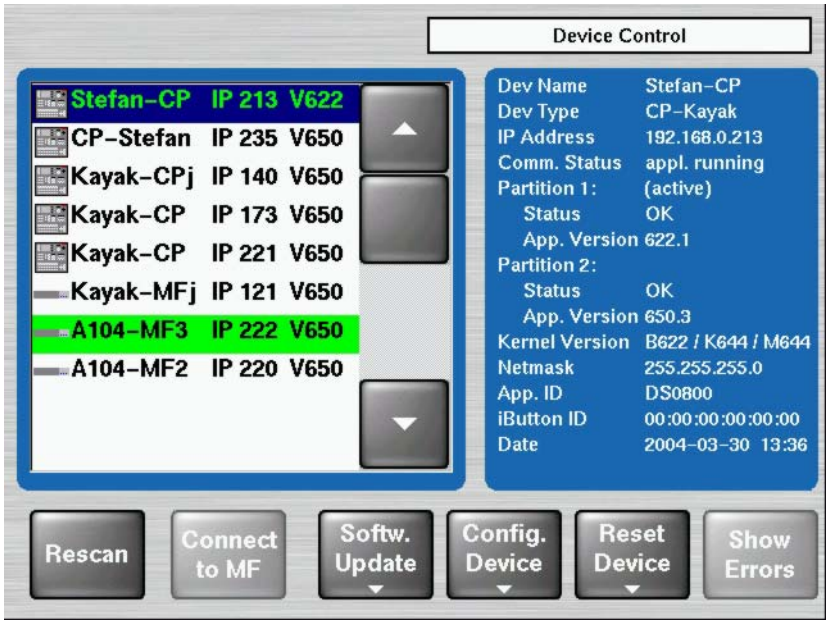
1. Press the **Home** button on the control panel.
2. Press **Install** on the control panel menu. The **Install** menu displays.
3. Press **System**. at the bottom of the **Install** menu. The **System** menu displays (Figure 51).

Figure 51. System Menu



4. Press **Device Control** in the **System** menu. The **Device Control** menu displays with a list of devices connected to the Kayak HD switcher in the left-hand pane.

Figure 52. Device Control Menu with Device List



5. Select the device whose IP address you want to configure from the device list by touching the name.

6. Press the **Config. Device** button at the bottom of the **Device Control** menu. The **Configure Device** menu displays.

Figure 53. Config Device Menu

7. Press the **Set IP Addr** button. A data pad displays to allow you to type in the IP address you want to use for the device you selected.

Netmask

A netmask is a string of zeroes and ones used to "mask" or screen out the network part of an IP address so that only the numbers for a single specific device remain.

To set the Netmask for a device using the Kayak control panel menu, follow the Set IP Address procedure above (see page 88) except select **Set Netmask** instead of Set IP Address. A data pad displays to allow you to type in the Netmask setting you want to use for the device you selected.

Network Settings - Telnet

Another way to configure network settings for the Kayak HD control panel and frame as well as for connected devices is to connect a computer to the switcher by using Telnet instead of the control panel menus.

Note For setting the Gateway address you must use Telnet as this setting is not available through the menus.

Open a Telnet Connection

To set up a Telnet connection for your Kayak HD switcher:

1. Connect a computer terminal to the Kayak frame using a pass-through male-to-female serial cable (do not use a null modem cable) connecting the DB9 connector on the front of the Kayak frame chassis to the communications port on the back of the computer.

Example:	Com 1 Port
Communications parameters:	
Baud	9600
Bits	8
Parity	None
Stop Bits	1

2. Open a terminal emulator software application (such as HyperTerminal or Windows command tool).
   a. From the Microsoft Windows interface click the **Start** button and select the **Run** option. The **Run** window displays.
   b. In the **Open:** text window type `cmd` and click **OK**. The command tool window displays.
3. Telnet into the Kayak Frame in the WindRiver VxWorks operating system by typing in:

`telnet` *`IPAddress_of_Kayak_Frame`*

Example: `telnet 10.16.20.71`

The `VXWorks login:` prompt displays

Type in:

Login name:	`target`
Password:	`password`

Your computer should now be connected to the Kayak frame using Telnet.

IP Address

To set the IP Address for a device using Telnet:

Type in the command:

`sysIPAddressSet "xxx.xxx.xxx.xxx"`

Example: `sysIPAddressSet "192.168.0.100"`

Netmask

To set the Netmask for a device using Telnet:

Type in the command:

`sysNetMaskSet "xxx.xxx.xxx.xxx"`

Example: If your Netmask is `255.255.254.0` then you would need to type in the command:

`sysNetMaskSet "255.255.254.0"`

Subnet Mask

A subnet mask is a setting used to screen information that is intended only for the local network within a company and to tell a router that the information should not be send outside the intranet.

A subnet mask resembles an IP address with its four quadrants of digits (usually sets of three) and is normally set to `255.255.255.0`. This setting tells the router that a message in which the first three groups of numbers are the same for both sender and receiver means these two devices are on the same network. It also means this information should not be sent out to another network.

To set the Subnet Mask for a device using Telnet:

Type in the command:

`sysSubnetMaskSet <mask_address_expressed_in_hex>`

Example: If your Subnet Mask is `255.255.254.0` then you would need to convert the address to hexadecimal code (`0xFFFFFE00` for address `255.255.254.0`) and type in the command:

`sysSubnetMaskSet 0xFFFFFE00`

Note The normal Subnet Mask that ships with the Kayak frame is `255.255.255.0`, which would be `ffffff00` in hex.

Gateway

CAUTION Resetting the default Gateway address for the Kayak HD frame can cause you to lose all network connections and all switcher functionality. This operation should only be done by a trained engineer. If you lose switcher function you must contact Grass Valley Support (see *Contacting Grass Valley* *on page 4*).

Most users will never need to reset the Gateway address.

The Gateway is a point on the network that allows that network to connect with other networks. It can send traffic from its own local network to the outside world to communicate with other networks. Gateways help to control traffic within your local network.

There are some situations in which certain users may find it necessary to reset the Gateway address.

- Running the Sidepanel software from a remote computer that is not on the same network as the frame or panel.
- Ignite systems may use more than a single network and require a different Gateway.
- NetCentral users may be on a different network than the Kayak frame.
- Routers may be on a different network.
- Machine control over IP
- Simulcast broadcasts

To set the Gateway address for a device using Telnet:

1. First you must physically connect your computer terminal to the frame as described in the section on *Open a Telnet Connection* *on page 91*.
2. Type in the command:

   `routeAdd <destination>,<gateway address>`

   Example: If you want to set the Gateway IP to be `192.168.0.217` you would type in the command:

   `routeAdd "0.0.0.0", "192.168.0.217"`

   The setting `"0.0.0.0"` would be valid for all the networks.

   The device specified in the second address in the command (`"192.168.0.217"` in the example) is the one that becomes the Gateway for the frame.

   The VxWorks operating system accepts the new Gateway address immediately without a reboot.

Note If you reboot the Kayak frame, it will reset the Gateway address to its previous setting. To reset the Gateway address permanently (so that it will remain after a reboot) please contact Grass Valley Group support (see *Contacting Grass Valley* *on page 4*).

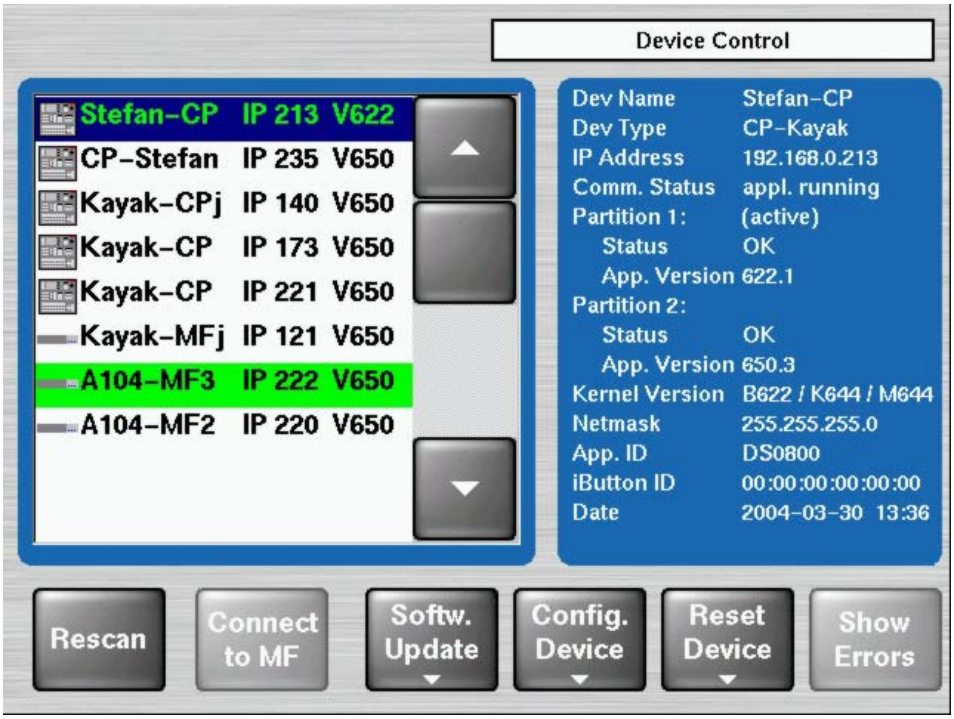
Software Installation

Kayak system software updates are distributed on a Kayak Software Release CD-ROM, or can be downloaded from the Thomson Grass Valley web site.

Software Versions

The currently loaded software versions of the Kayak system devices is shown on the Device Control menu, accessed via **Home – Install – System – Device Control** (Figure 54).

Figure 54. Device Control Menu



The Device Control menu shows on the left all the network connected devices (Kayak-MF = Mainframe, Kayak-CP = Control Panel) with IP address and software version installed.

On the right details of the selected device are listed.

Software Update

Software updates can be installed to Kayak system components by transferring the software to a compatible USB flash drive that can be plugged into the switcher control panel. Refer to the *Kayak Release Notes* for a list of compatible flash drives.

Starting with Software Release V680 the software update also can be executed directly from a PC that is on the same network as the Kayak system devices. Inserting the Kayak Software CD-ROM into the PC launches an `autorun` program. If `autorun` is disabled on your PC, the program can be started manually from `/autorun/autorun.exe` on the CD. The installation program is multilingual and self explanatory.

The Sidepanel program is also available on the Kayak Software CD-ROM or with the web site download. The Sidepanel program can be installed onto a PC and used for Kayak system configuration and to access additional advanced Kayak system capabilities.

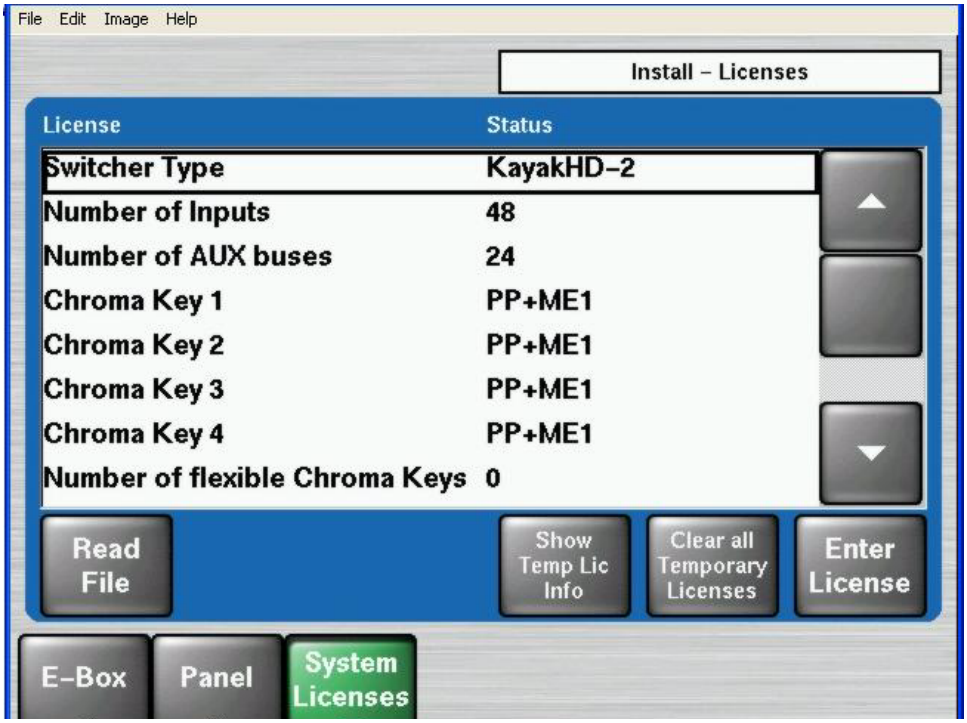
Refer to the latest *Kayak Release Notes* for a detailed description of the complete software installation procedure.

Software Option Licenses

Kayak HD has a software option licensing system. You can see the number and type of possible licenses for your system by going to the **Licenses** menu under **Home | Install | System | Licenses** (Figure 55).

The Licenses menu is used to add licenses to a system. The licenses are stored in 2 EEPROMs (Electronically Erasable Programmable Read Only Memory chips) located in the backplane of the frame. Licenses cannot be moved between different Kayak HD frames.

Figure 55. Install Licenses Menu



Available Options and Configuration Licenses

The following operation features are options or configurations available only if the corresponding license is activated.

- Switcher Type
- Number of Inputs
- Number of Outputs
- Chroma Key
- RGB Color Correction
- DPM Channels
- Kurl (Kayak HD/SD only, not KayakDD)
- Spektra (Kayak HD/SD only, not KayakDD)
- DSK/Half M/E (Kayak HD/SD only, not KayakDD)
- NetCentral

Note For basic operation licenses are required for **Switcher Type**, **Number of Inputs**, and **Number of Outputs**.

Additional licenses for newly developed features may become available in the future.

A license is actually a line of text expressed in a format similar to this chroma key license key:

```
key="LIC_CHROMA_KEY1","1","0000:00:00","9999:12:31","3
4567", "8-xyz","2005:12:06",
"3489c00db5b1c548e9daf7fbe0ed67eb21"
```

Installing Licenses

Kayak system licenses can be installed two different ways.

- The recommended installation method consists of copying the `sp_license.txt` file (which contains all your licenses) to a supported USB flash drive, and using the Licenses menu to install them onto your system.
- An alternative installation method consists of manually entering the text string of each license using a GUI keyboard available on the Licenses menu.

With either method a Kayak system reboot is required to activate the licenses.

Refer to the latest *Kayak Release Notes* for detailed license installation procedures.

Button Assignment (Source to Button Mapping)

Source to button mapping makes it possible to organize sources on Kayak control panels to suit your personal preferences. For example, cameras can be grouped into a set of buttons on the left side or the right side of a button row, or in any way that is desired or convenient.

Source mapping is distinct from source definition, as source mapping only involves the location of sources on the control panel and does not affect the inputs or names defined for the sources.

Note E-MEM effects store Source IDs, not the source select buttons, so remapping sources does not change the appearance of recalled effects.

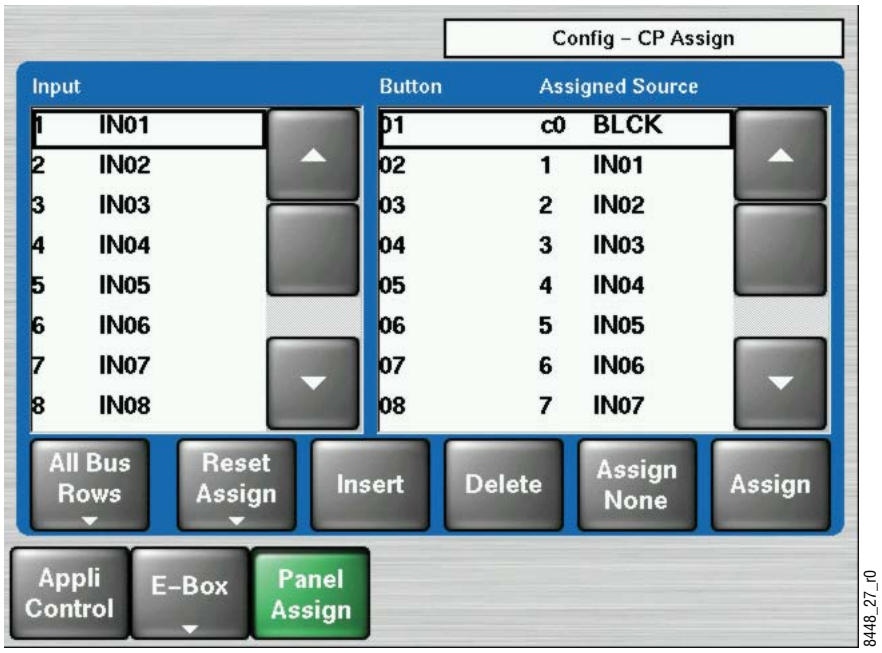
Assign Sources

To assign a source to a button on the Kayak HD switcher:

1. Press the **Home** button on the control panel.
2. Press **Config** on the control panel menu.

3. Press **Panel Assign** at the bottom of the **Config** menu. The **Config - CP Assign** menu displays.

Figure 56. Config - CP Assign Menu



The right-hand window pane displays a list of Buttons with their Assigned Sources (if sources have been assigned).

Note See Table 10 on page 128 for descriptions of the available sources.

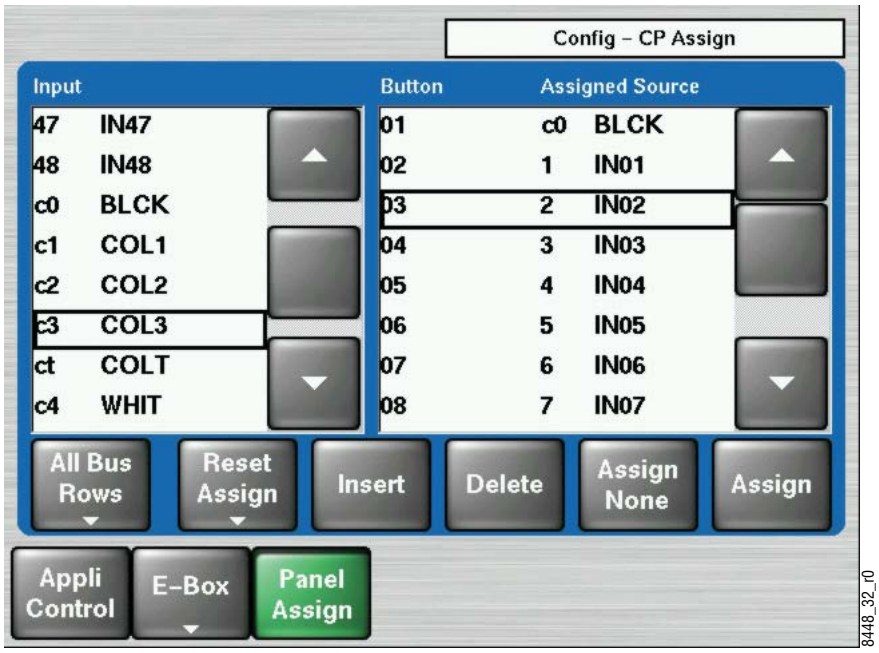
4. Press the number of the Button you want to assign (or re-assign).

   The left-hand window pane displays a list of Inputs. These may come from a number of different sources, but typically the first sources displayed correspond to video inputs connected to the backplane of the Kayak HD frame.

   The number on the left (such as **1** in Figure 56) is the number of the input recognized by the switcher. This number does not change. The name to the right of the number (such as **IN01** in Figure 56) is the Short Name of the source. The Short Name is a four-character name that is shown on the Source Name Displays (also called Mnemonic Displays) above the buttons on the control panel.

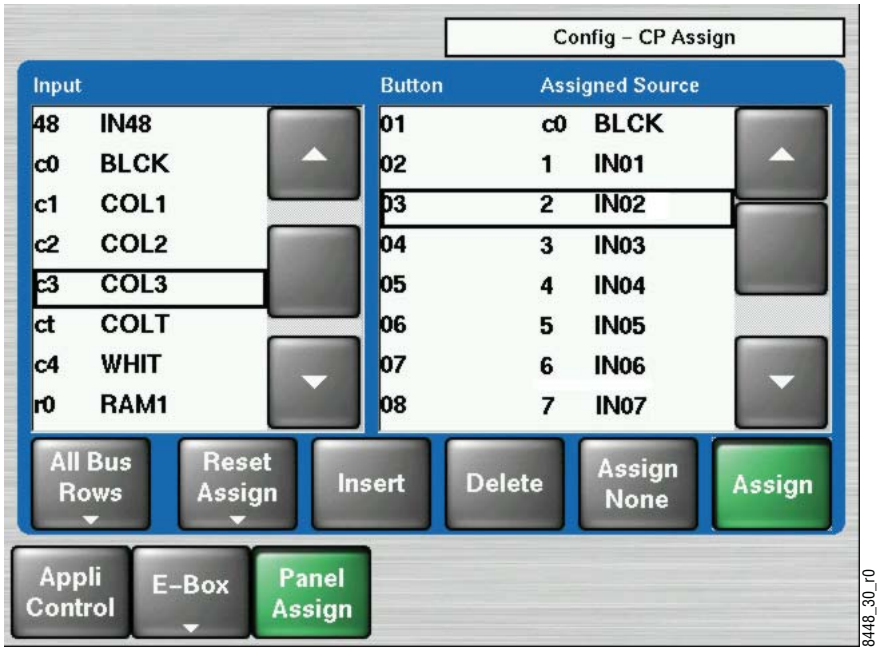
5. Press the number-name pair for the Input source you want to assign to the button you just selected.

Figure 57. Input Selected for Assignment in Left-Hand Input Pane



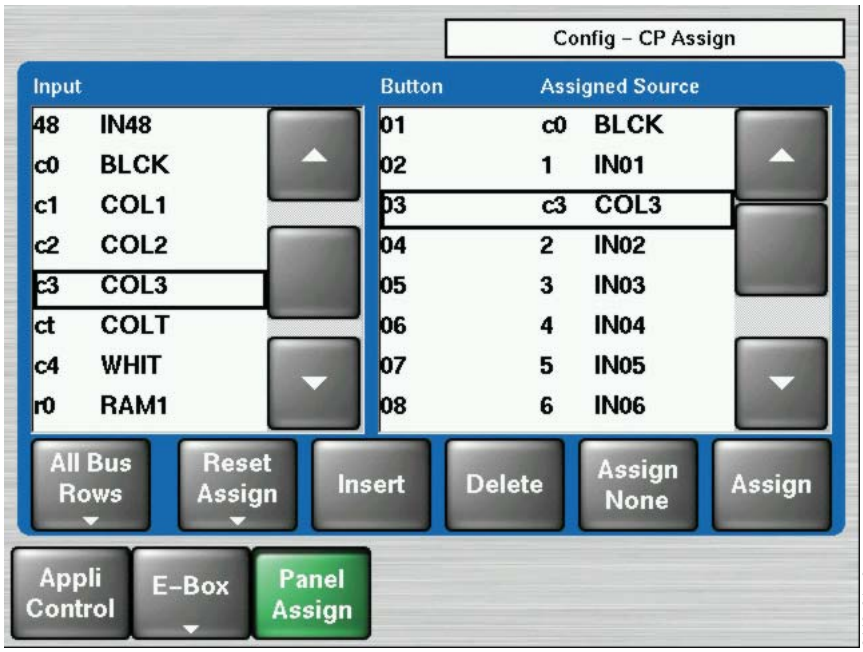
6. At the bottom right of the Button pane press the **Assign** button to assign the Input you selected to the Button you selected.

Figure 58. Assign Button at Bottom Right



The Button you assigned (**03** in Figure 59) can now be used to call the Input source you assigned to it.

Figure 59. Button with New Source Assigned



In Figure 59 Button **03** on the right-hand Button pane has been assigned to use Input source **c3** whose Short Name is **COL3**.

You can also assign sources to buttons using the Sidepanel program on a computer connected to the Kayak frame.

Note See Table 10 on page 128 for descriptions of the available internal sources.

Rename Sources

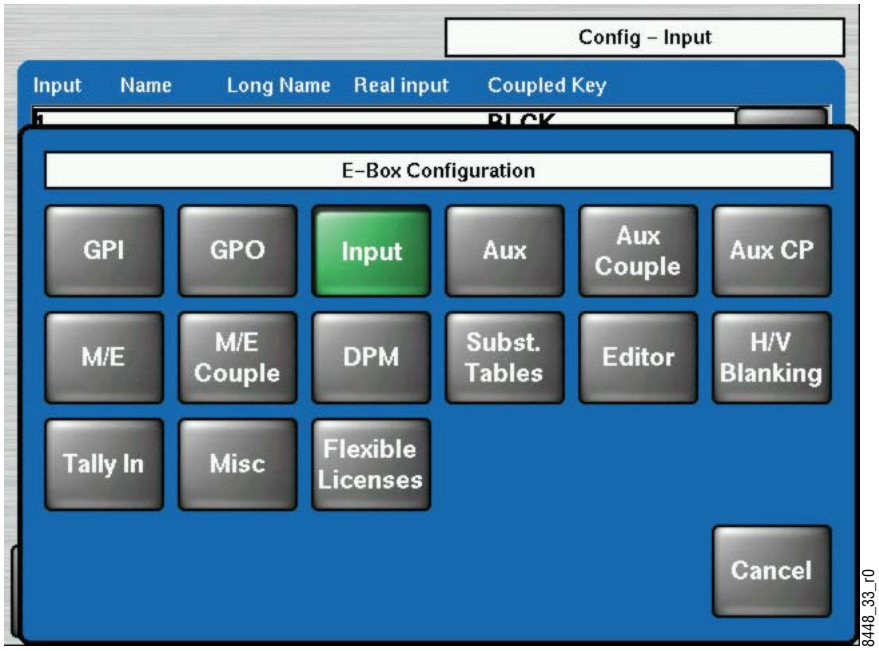
To rename a source that has already been assigned on the Kayak HD switcher:

1. Press the **Home** button on the control panel.
2. Press **Config** on the control panel menu.

Note Do NOT press the **Install** button. The Install menu hierarchy contains similar looking source naming screens that do not affect what is displayed on the control panel.

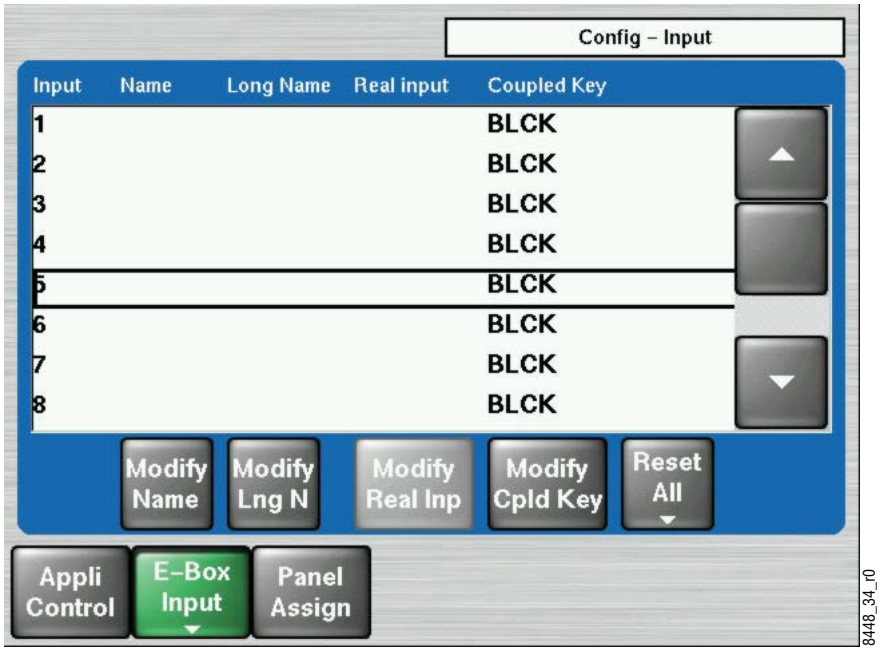
3. Press **EBox**. The **Ebox Configuration** menu displays.

Figure 60. Ebox Configuration Menu



4. Press the **Input** button. The **Config - Input** menu displays.

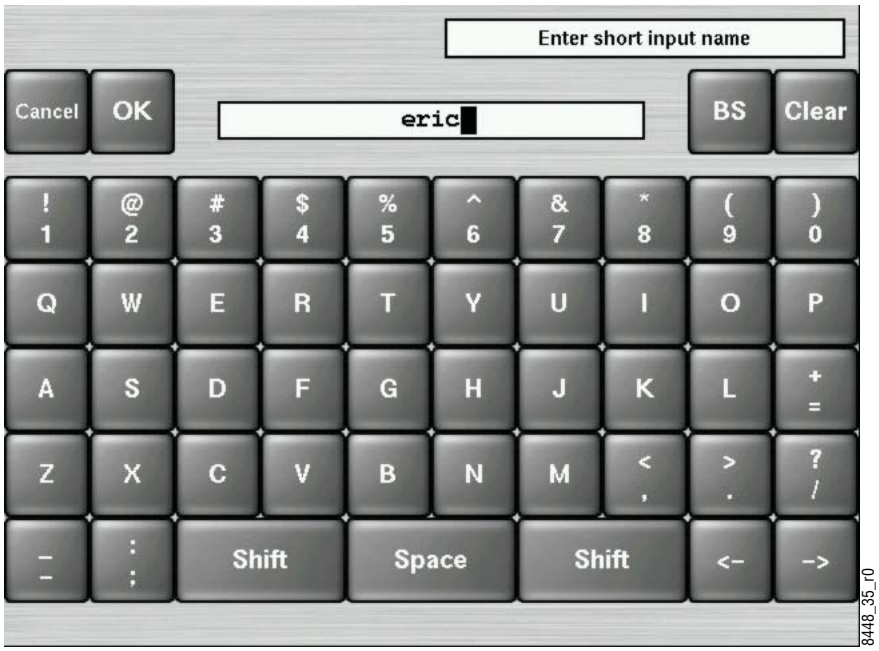
Figure 61. Config - Input Menu



5. From the **Config - Input** menu press **Modify Name** to change the Short Name of a Source. The **Enter short input name** typing pad displays (see Figure 62).

   The Short Name is the name you give a Source that shows up on the Source Name Displays above the buttons on the control panel. Short Names are restricted to four characters.

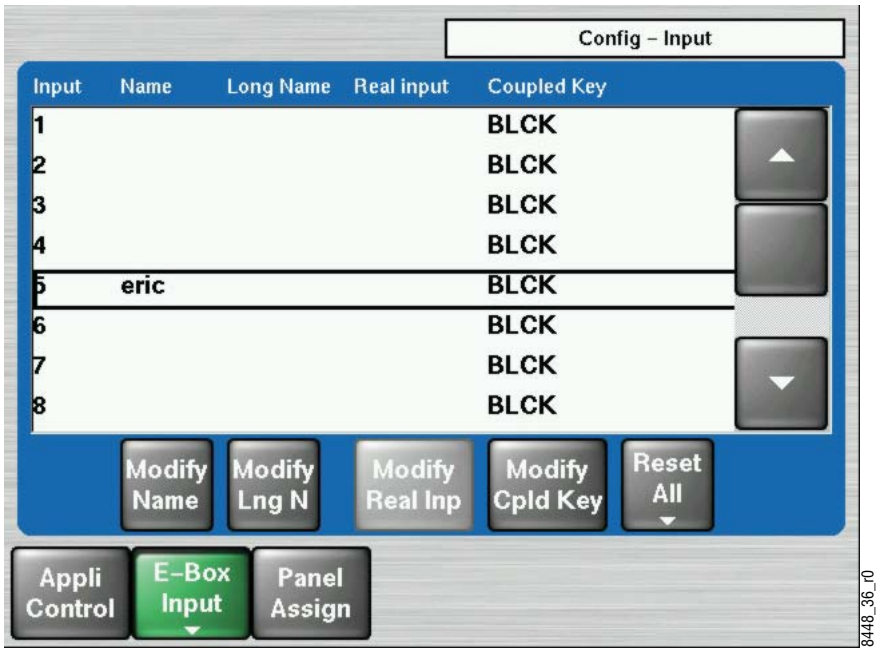
Figure 62. Enter Short Input Name Typing Pad



Use the keys on the typing pad to type in the Short Name you want to use for your Source and press **OK**.

The input Source you selected is now renamed with the name you chose (Figure 63 on page 103).

Figure 63. Renamed Source



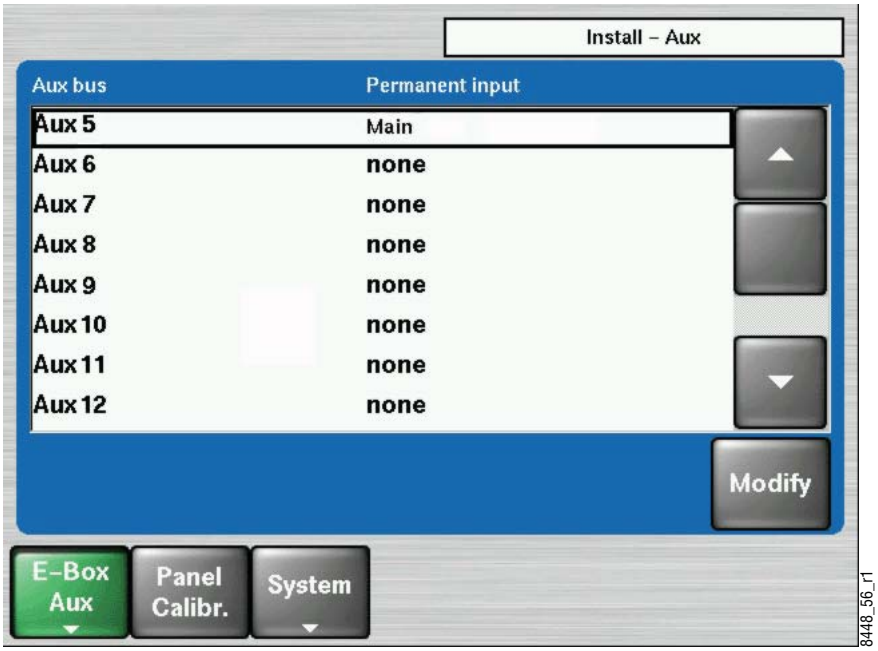
You can also press **Modify Lng N** to change the Long Name of a button. The Long Name can be a slightly longer name you might use in the Kayak control panel menus to describe the source in more detail. To modify the Long Name use the same procedure described in *Rename Sources on page 100* but press the **Modify Lng N** button to change the Long Name in Step 5.

Assigning Permanent Sources to AUX Buses

The default output configuration of a Kayak system maps Aux 1 to output BNC 1, Aux 2 to BNC 2, etc. You will probably want to permanently assign your program output (**Main** or **MEH**) to the Aux bus feeding your program monitor, and the preview output (**PVWP** or **PVWH**) to the Aux bus feeding your preview monitor.

Use the **Install - EBox - AUX** menu to assign permanent sources to AUX bus output BNCs.

Figure 64. Install – AUX Menu



Grass Valley recommends that you use upper AUX busses for monitoring purposes. This leaves lower AUX busses free for special purposes, i.e. external DPMs.

Note If an AUX bus has been assigned a permanent internal source selection the main control panel for that AUX bus is locked out.

1. From the **Home** menu press **Install - EBox - AUX**.
2. From the menu displayed select an AUX bus.
3. Press the **Modify** button in the bottom right of the **Install - EBox - AUX** menu to display a list of sources that can be assigned.
4. Select the source you want to assign and then press the **OK** button.

Note See Table 10 on page 128 for descriptions of the available sources.

Assigning On-Air Tallies

1. From the **Home** menu press the **Config - EBox - Tally In** button.
2. From the menu displayed select the AUX bus you want to assign On-air Tally status.
3. Press the **Tally Overall** button in the upper left of this menu.

4. Now configure your Tally settings for the AUX bus you just selected by using the left-hand **Modify** buttons. These buttons toggle to Active or none (represented by a dash on the screen).
   - Press **Modify Red** to activate On Air Status.
   - Press **Modify Green** to activate Look Ahead Tally.
   - Press **Modify Yellow** to activate Iso Tally.

Save Installation and Configuration Settings

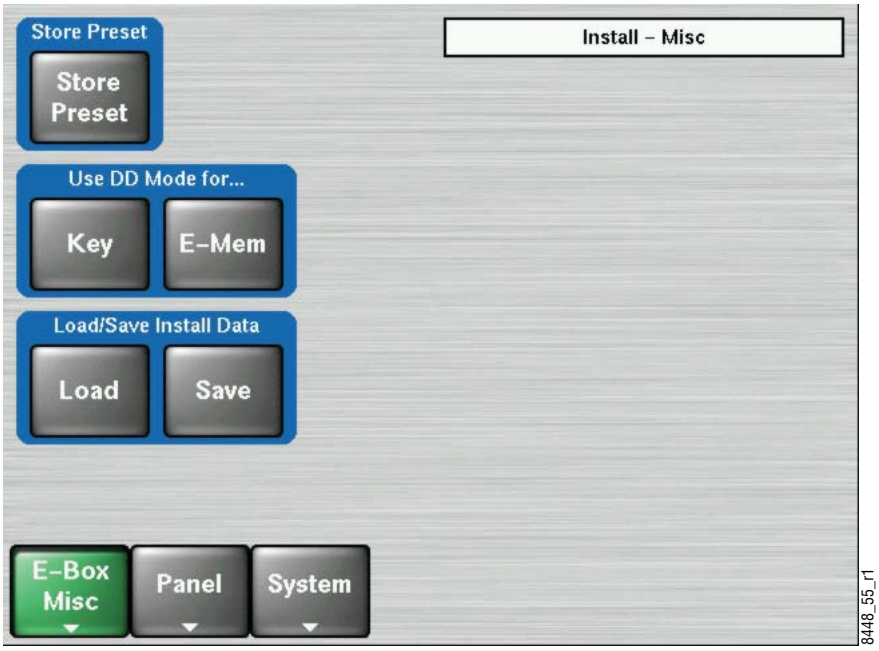
Once configured, you will want to backup the installation settings so they can be quickly reloaded if necessary. Different groups of settings are saved using different methods.

It is also a good practice to create and save a few standard sets of operating settings so you can easily return the switcher to known states for system testing and/or troubleshooting. Only one complete set of installation settings (called environmental data), and only one subset of panel install settings, can be saved and loaded to a particular USB stick, however. If you want to keep multiple sets you will need to save them directly onto a different USB sticks, or copy these files to a separate computer.

Save All Install Data

All the settings (called environmental data) located in the Install menu hierarchy are saved to and loaded from USB flash memory with the **Install - E-Box - Misc** menu (Figure 65).

Figure 65. Install - Misc Menu



Note The Save button is grayed out (inoperable) if a USB stick is not present in a supported control panel USB port. The Load button is grayed out if no USB stick is present of if no files are available to load from the USB stick. USB ports labeled SPARE are not supported.

1. Insert a compatible USB stick into an active Kayak panel USB port.
2. Press **Home - Install - EBox - Misc** to access the menu.
3. Touch the **Save** button to save the data. An overwrite message will be displayed if a file of that name already exists.
4. After saving the data, remove the USB stick and store it in a safe place.

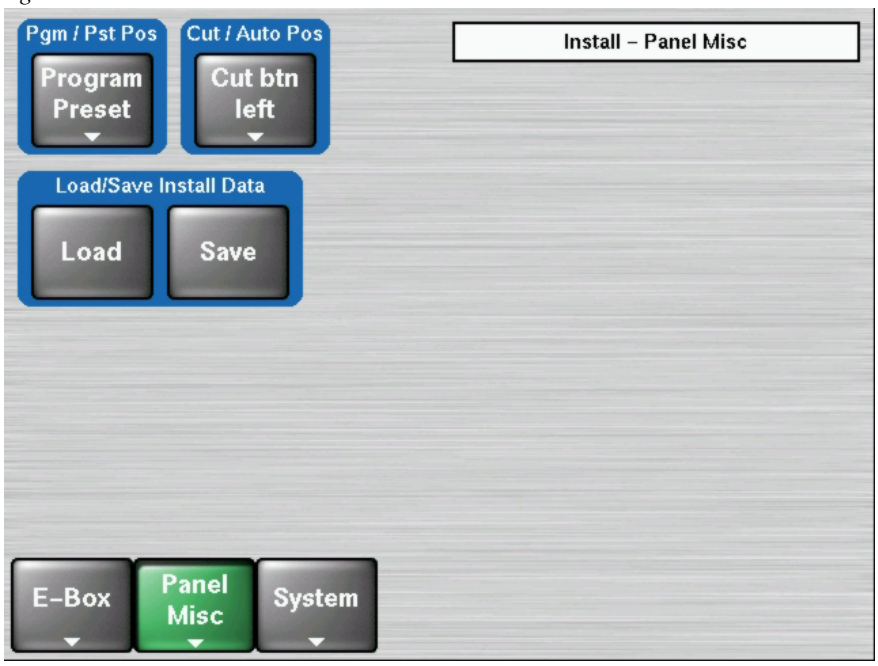
Pressing the **Load** button with a USB present containing Install data will load that data to the Kayak system. A reset will be required to activate the new settings.

Note The Sidepanel program identifies the Install data as Global settings.

Save Panel Install Data

You can also save and load a subset of the install data that pertains only to control panel settings by going to the **Install - Panel - Misc** menu (Figure 66).

Figure 66. Install Panel Misc Menu

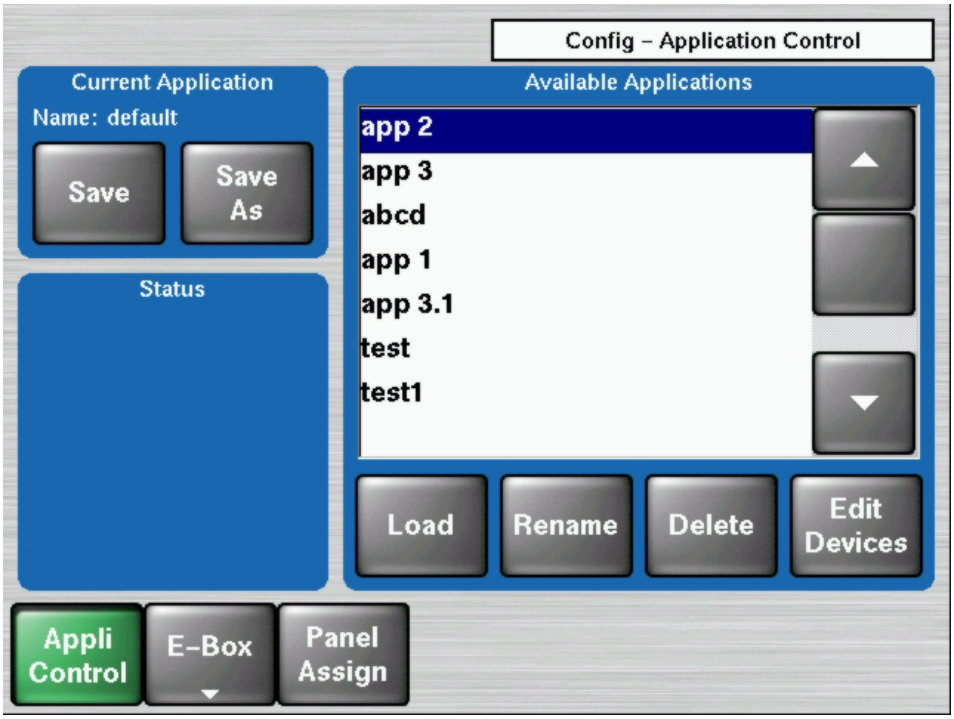


The last set of environment data loaded will be used by the system.

Save Application Data

All setting in the Config menu hierarchy, and other operational settings (E-MEMs, etc.) are saved and loaded separately as Applications via the Config - Application Control menu (Figure 67).

Figure 67. Config – Application Control



Note The Save button is grayed out (inoperable) if a USB stick is not present in a supported control panel USB port. The Load button is grayed out if no USB stick is present of if no files are available to load from the USB stick. USB ports labeled SPARE are not supported.

1. Insert a compatible USB stick into an active Kayak panel USB port.
2. Press **Home - Config - Appli Control** to access the menu.
3. Press **Save As** and give the Application a descriptive file name.
4. After saving the data, remove the USB stick and store it in a safe place.

To load a previously saved Application, select it on the scrolling list on the right and press **Load**.

Panel Lock

Locking The Panel

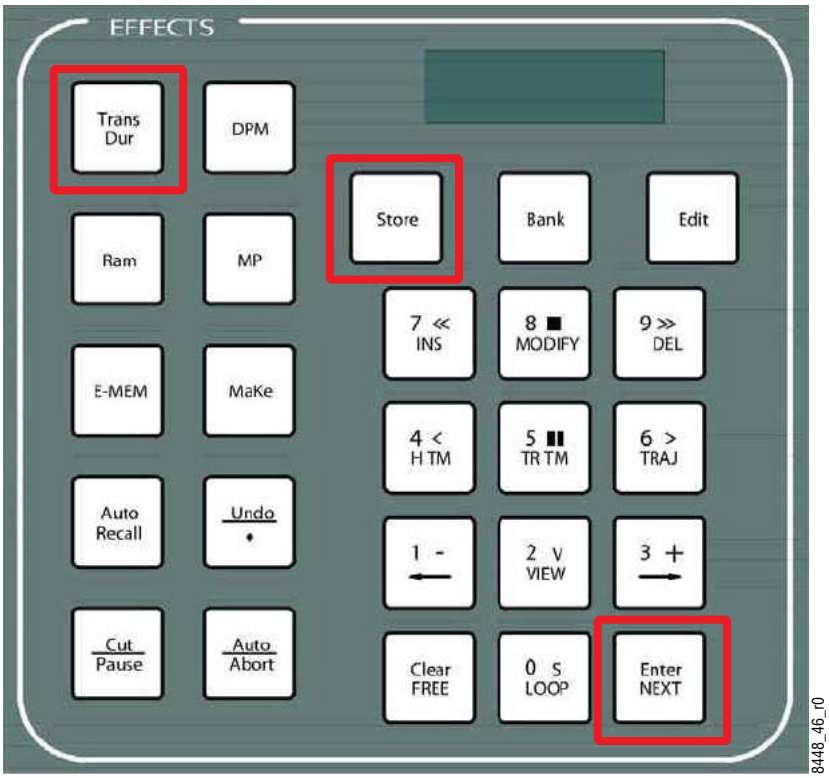
Once you have configured the Kayak HD you may want to lock the panel to prevent accidental or unauthorized changes to control adjustments or settings.

This means that (almost) all menus are accessible, but no value on mainframe or panel can be changed. The text **Locked** is displayed in all menus. The panel cannot be detached. When the panel is locked, the attached side panel is also locked.

To lock the Kayak HD control panel in DD Mode (Figure 68):

1. Press and hold the button **TransDur** along with the button **Store** in the Effects button section of the panel.
2. Using the numeric buttons, enter the password `3511` and press **Enter**.

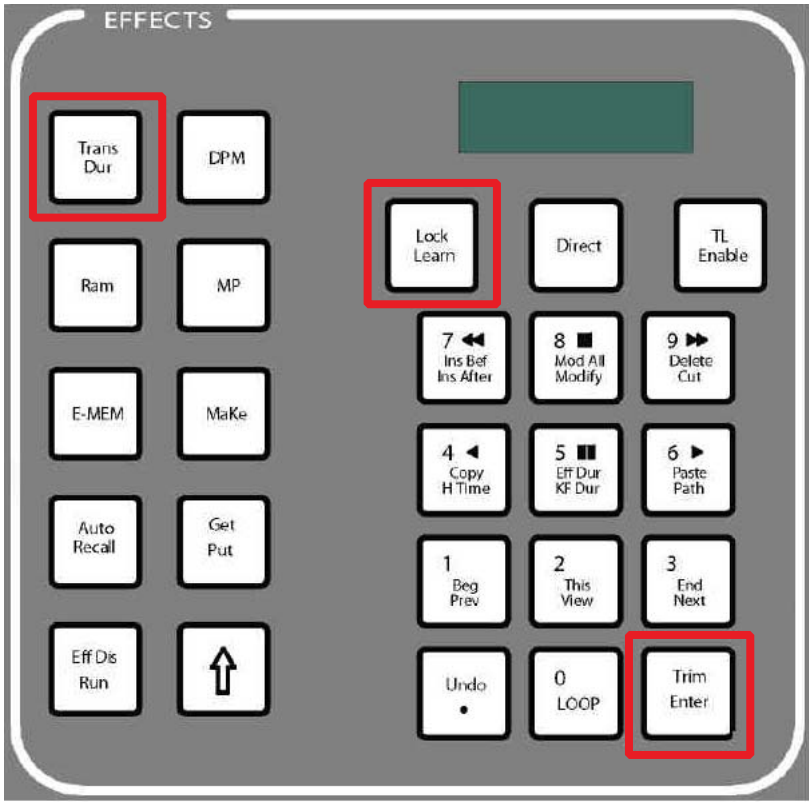
Figure 68. Locking the Panel from the Effects Button Section in DD Mode



To lock the Kayak HD control panel in Default Mode (Figure 69):

1. Press and hold the button **TransDur** along with the button **Lock Learn** in the Effects button section of the panel.
2. Using the numeric buttons, enter the password `3511` and press **Enter**.

Figure 69. Locking the Panel from the Effects Button Section in Default Mode



Unlocking The Panel

To unlock the Kayak HD control panel:

1. DD Mode: Press and hold the button **TransDur** along with the button **Store** in the Effects button section of the panel.

   Default Mode: Press and hold the button **TransDur** along with the button **Lock Learn** in the Effects button section of the panel.

Note The panel can also be unlocked by turning off the power to the switcher and then turning it back on again.

Install Menus Reference

The Install menu contains system setups. Most of them are only used during installation. Some more advanced system functions are not yet supported by these menus. You can use the Sidepanel application on a separate personal computer to access these advanced functions.

Note The last menu accessed is re-displayed when you return to the Install menu hierarchy.

Install - E-Box

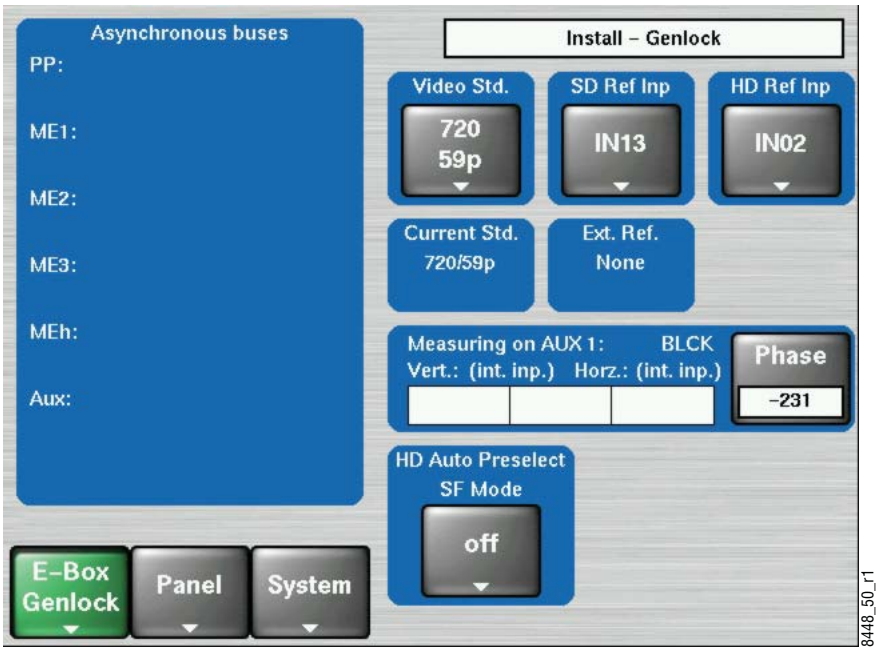
Figure 70. Install – E-Box Setup Dialog

After touching the **E-Box** button in the Home menu a new dialog appears with the setup items shown in Figure 70:

In the following sections the most important Install menus are described. Once you understand the principles of Kayak HD system menu organization and operation, you will be able to quickly learn these new menus and use them effectively for your work.

Install - Genlock Menu

Figure 71. Install - Genlock Menu



The **Install- Genlock** menu reports the status of the sync regenerator of the Kayak HD system, and is used to switch between HD and SD operating modes and adjust input timing.

The selected video standard is reported in the **Current Std.** field. The Kayak sync regenerator locks to an incoming reference signal and reports the line standard it is regenerating in the **Ext. Ref.** field.

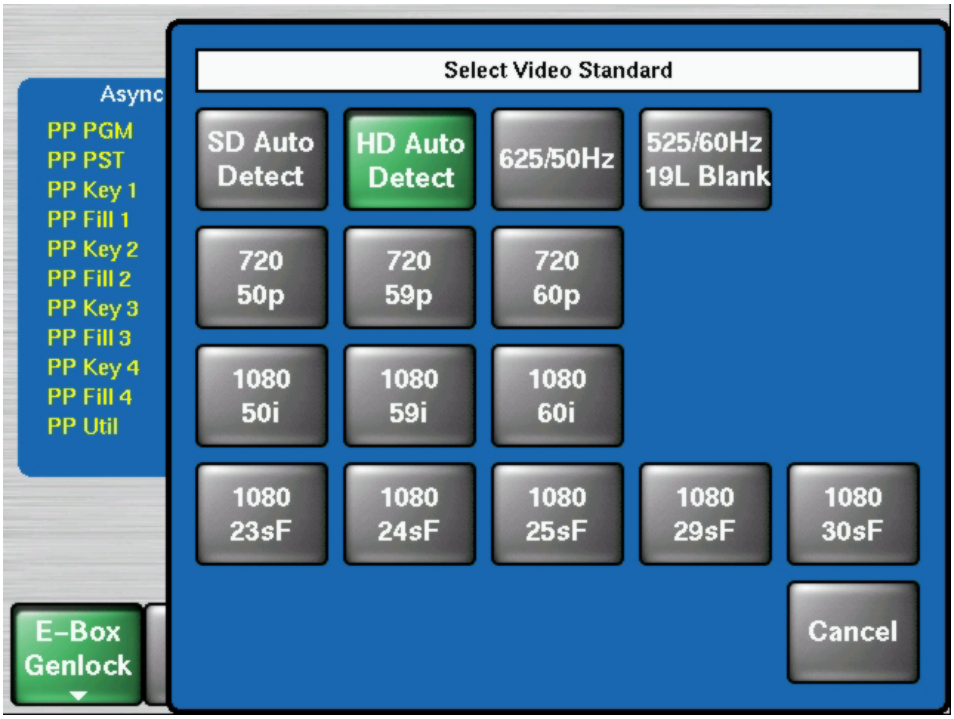
That operating mode persists until a reference input different from the current line standard is detected and locked to. If the reference signal is temporarily lost, the Kayak system will continue to free run in that line standard and a status of **NONE** is reported.

Selecting the Video Standard

Data pad Video Std.

Choose the desired HD standard

Figure 72. Install – Select Video Standard

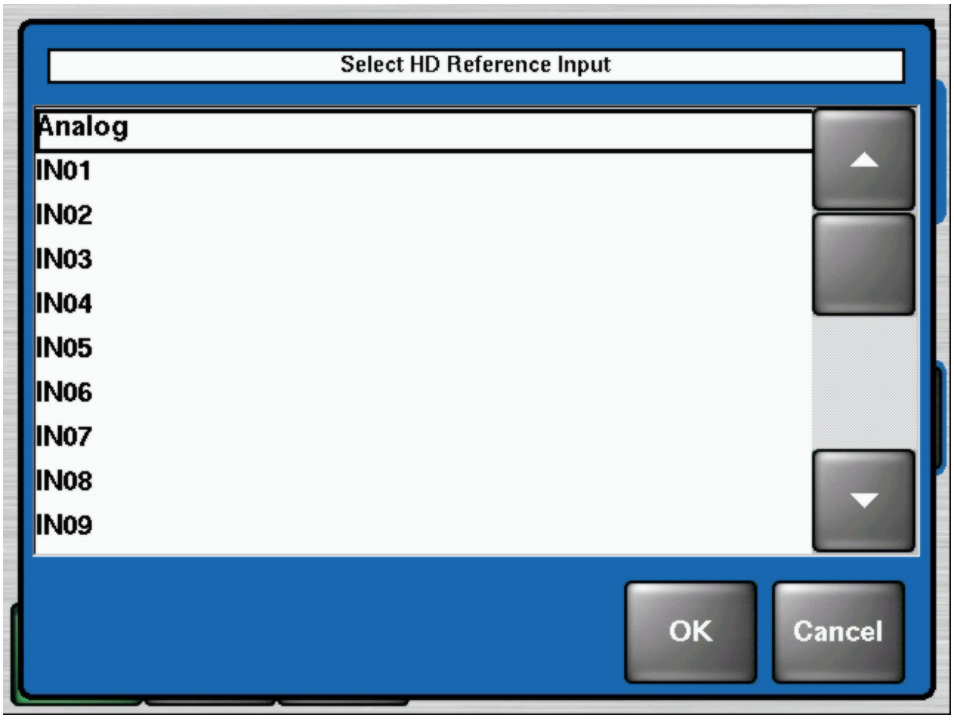


Selecting the Video Reference Source

1. Data pad SD Ref Inp
2. Select desired genlock input type Analog or Digital
3. Data pad HD Ref Inp
4. Select desired genlock input type Analog or Digital

Example for HD Ref Input:

Figure 73. Install – Select Reference Input



Analog — Analog Reference signal connected with jack HD ANALOG

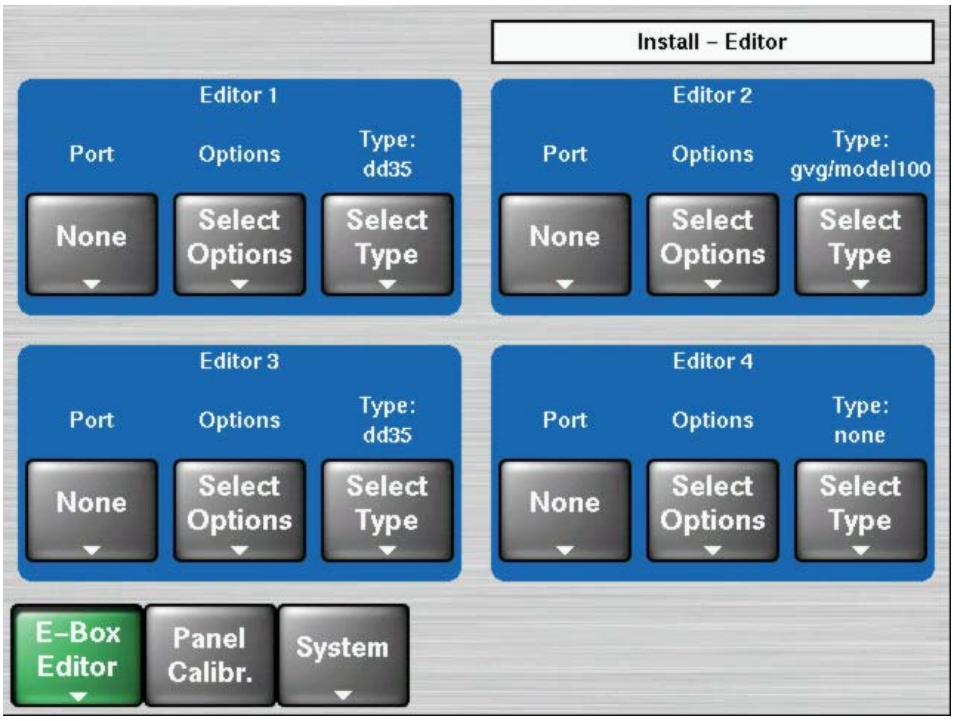
REFERENCE — Used for synchronizing the switcher.

IN 01 … IN24 — Selected input source is used for synchronizing the switcher

Install - Editor Menu

Basic editor control of the Kayak HD system is supported. Capabilities include: Source selection, Key selection, Wipe selection, Preview, Timeline control (Jog/Go to Time, Run, Rewind), Transition Mode, Rate, and Triggers, All Stop, E-MEM.

Figure 74. Install - Editor Menu



The Editor menu permits to configure the serial ports 1 … 8.

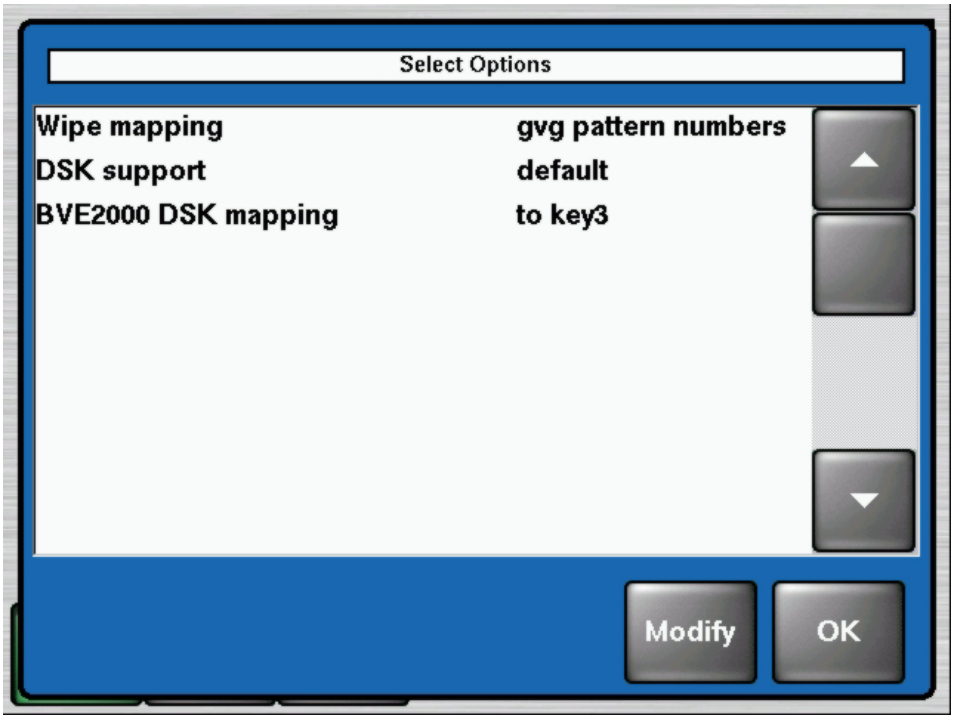
- Select **Port #** (Port 1 – 8)
- Select protocol type
- For some remote protocols configuration options are selectable.
- The options can be selected by pressing the **Select Options** button.

Special Editor Protocol BVE-2000 Options

1. Wipe Mapping: “GVG Pattern Numbers”, “XtenDD Pattern Numbers”
2. DSK Support: “BVE2000”, “default”
3. DSK Mapping: “to Key4”, “to Key3”

Default settings are underlined.

Figure 75. Install - Editor Options Menu



Hints for ESAM-2 and Yamaha DM-1000 Audio Switcher

If a Yamaha DM-1000 audio switcher is controlled via the ESAM-2 protocol please note the following behavior:

The Yamaha DM-1000 has a different input number as defined in the ESAM-2 protocol

Table 8.

Select	Response
Video Input 1	Audio Fader 8
Video Input 2	Audio Fader 7
Video Input 3	Audio Fader 6
Video Input 4	Audio Fader 5
Video Input 5	Audio Fader 4
Video Input 6	Audio Fader 3
Video Input 7	Audio Fader 2
Video Input 8	Audio Fader 1
Video Input 9	Audio Fader 16
Video Input 10	Audio Fader 15

Install - GPI Menu

GPI Inputs can be used by an external device to trigger an action on the Kayak HD system. See Installation Manual for pinout specifications.

The GPI In menu allows programming up to 32 system GPI inputs. Various actions can be performed when a GPI contact closes, including selecting a source on a bus, recalling an E-MEM, and triggering a transition.

In this **Install-GPI** menu the physical properties of each GPI channels can be adjusted.

Figure 76. Install - GPI Menu

To program a GPI, select the GPI input to program from the scrolling list in the central pane. Then select **Modify** to determine whether the rising or falling edge of the arriving signal **GPI1 … GPI32** is to be used.

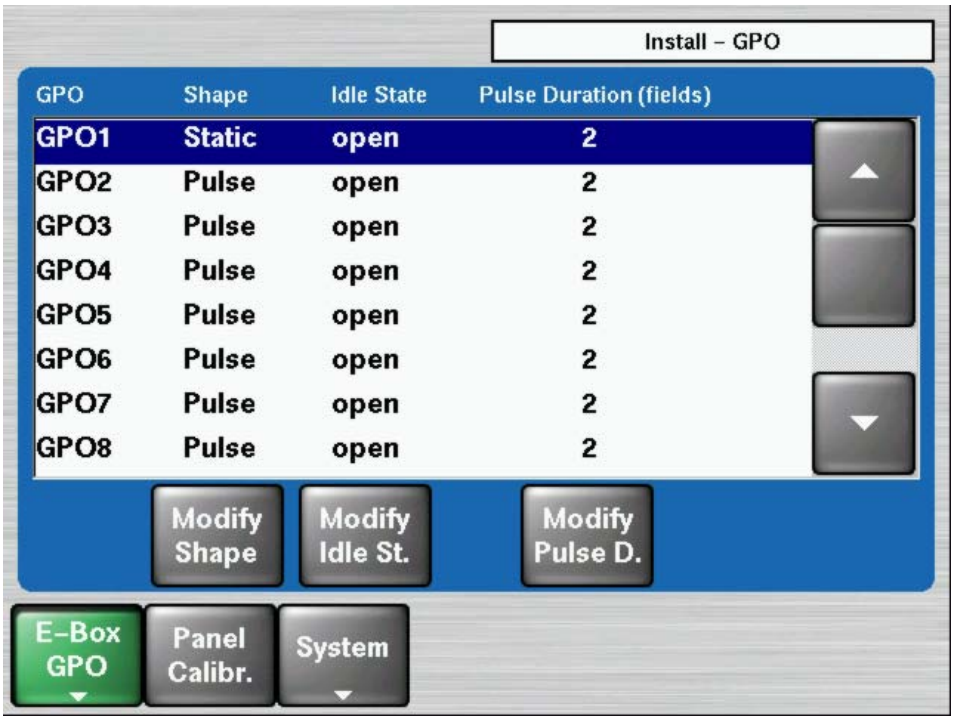
Note A GPI is considered Active when current flows through the LED of the opto-coupler at the GPI input. When no current flows the GPI is Inactive. Hence a Rising edge is the transition from Inactive to Active, and a Falling edge is the transition from Active to Inactive.

Install - GPO Menu

GPO Output contact closures are used by the Kayak HD system for simple trigger control of external devices. See Installation Manual for pinout and voltage specifications.

In this Install-GPO menu the physical properties of up to 128 GPO channels can be adjusted.

Figure 77. Install - GPO Menu



To program a GPO, select the GPO input to program from the scrolling list in the central pane. Then select **Modify …** to change the parameters:

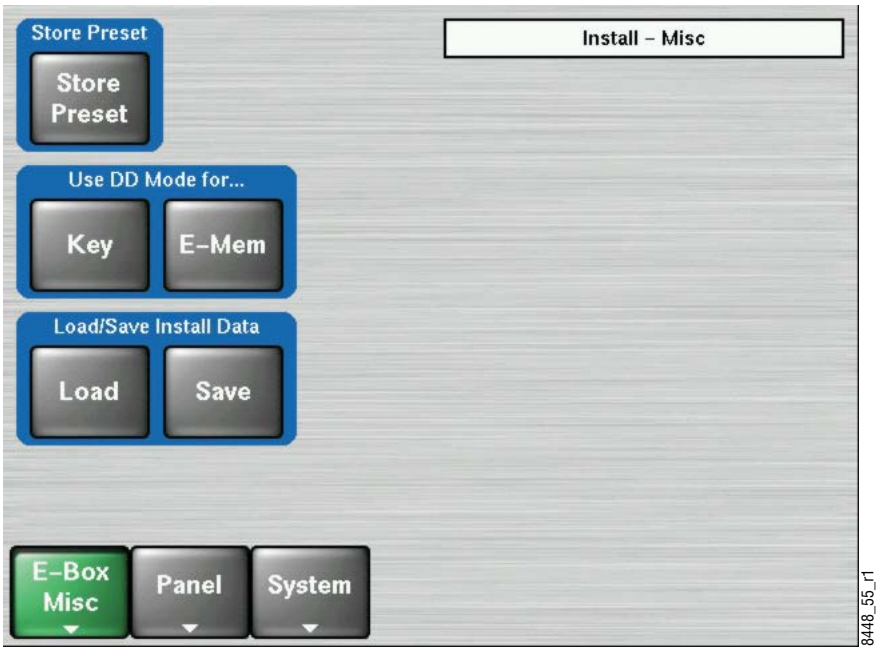
Shape: Pulse / Static

Idle State: open / closed

Pulse Duration: Enter the preroll time in frames (max 255 frames)

Install - Misc Menu

Figure 78. Install - Misc Menu



Store Preset

Pressing **Store Presets** the panel user operating settings are saved. To recall the settings use the **Recall Operation Preset** button in the Home menu.

DD Modes

In the Default Mode (buttons not illuminated) the behavior of Kayak's E-MEM and Keyers system is closer to that of Kalypso/Zodiak switchers.

If a **DD Mode** button is activated (button illuminated) the behavior is like that of the KayakDD or XtenDD switcher systems.

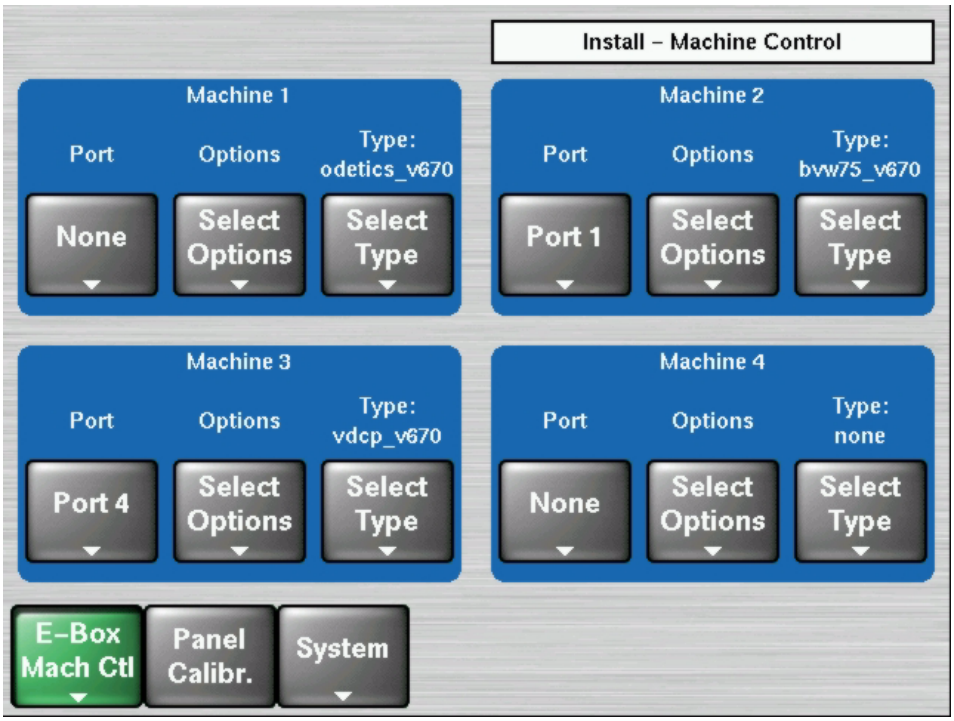
Load Save Install Data

Used to load or save all Install settings to or from a supported USB stick.

Note The Save button is grayed out (inoperable) if a USB stick is not present in a supported control panel USB port. The Load button is grayed out if no USB stick is present of if no files are available to load from the USB stick. USB ports labeled SPARE are not supported.

Install - Machine Control Menu

Figure 79. Install – Machine Control Menu



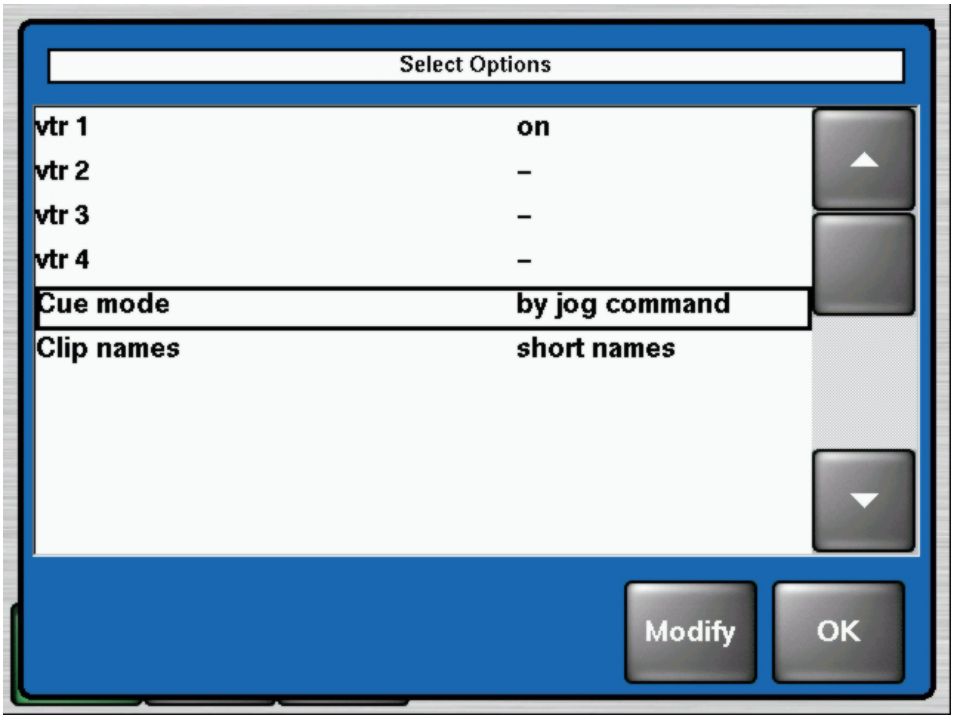
- Up to four external machines (VTR, Disc Recorders, Laserdisc Players) can be connected via Port 1…8. The menu serves to set the respective port numbers and protocol types.
- For some remote protocols configuration options are selectable (all GVG200 based protocols, AMP, Odetics, VDCP, BVW75).

The options can be selected by pressing the **Select Options** button (see details below).

- Select option and change value by pressing the **Modify** button.

Special Machine Control Options - VDCP Protocol

Figure 80. VDCP Protocol Options



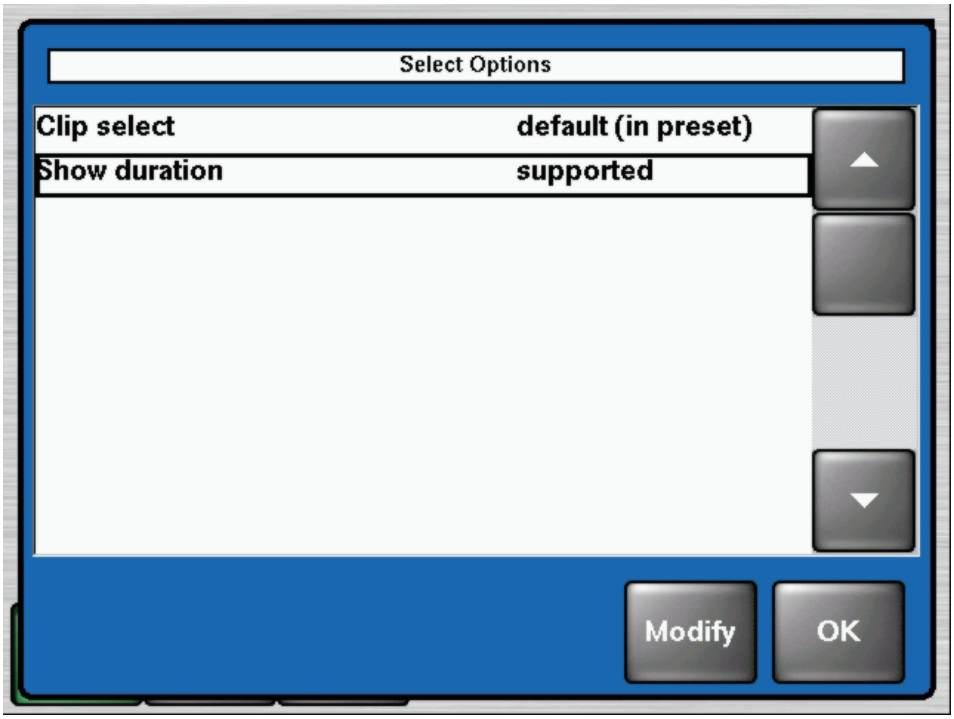
1. VTR 1 – 4: Use this options to select the disk servers local video ports.
2. Cue mode: “by jog command”, “default cue”
3. When a clip is cued (“Go To Timecode”, “Go To MarkIn/MarkOut”) most disk servers are (re)initializing their local video port. While initializing the port the signal is switched to black for a short time. After cuing is completed it is usually not possible to play the clip to a timecode position less than the cueing timecode. The Cue Mode options “by jog command” prevents the disk server from (re)initializing the local video port.

Note Not all disk servers are supporting this option.

4. Clip names: “long names”, “short names”
5. To select and activate clips with more than 8 character length, the option “long names” can be used. This option requires that the disk server also supports long clip names. The default setting “short names” should be supported by every disk server.
6. Default settings are underlined.

Special Machine Control Options - ODETICS Protocol

Figure 81. ODETICS Protocol Options



1. Clip select: mode1 (cue up), default (in preset)
2. If clip selection with ODETICS doesn't work on default, use the "mode 1 (cue up)" option.
3. Show duration: supported, not supported
4. If the connected disk server supports an ODETICS protocol variant that supports clip duration requests, use the option "supported".

Special Machine Control Options - BVW-75 Protocol

Figure 82. BVW-75 Protocol Options

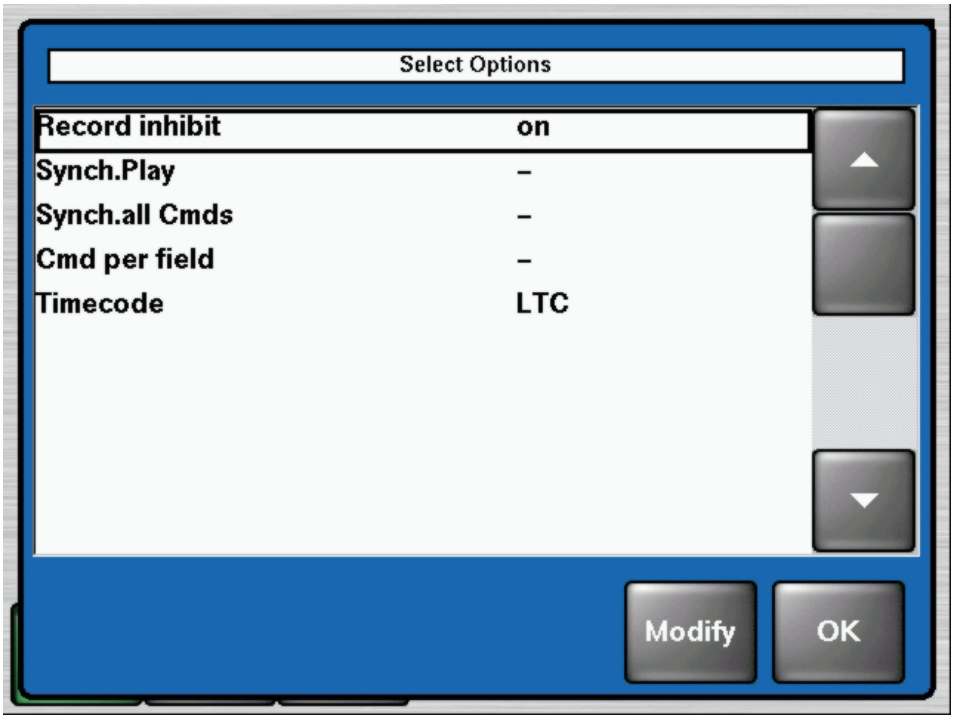
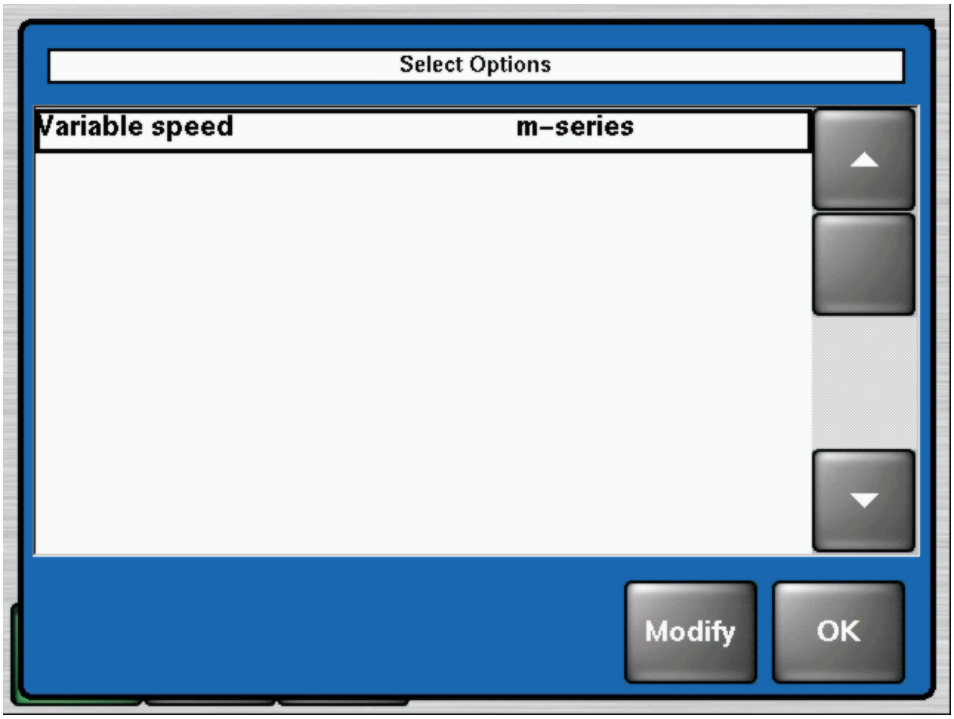


Table 9. Special Machine Control Available Options

Name	Available Settings (Default settings underlined.)	Function
Record Inhibit	"on" / "off"	Prevents deleting already recorded material. The Rec command will be switched to a Play command.
Synch.Play	"on" / "off"	Synchronized the Play command for 4 machines. This option is needed to synchronize all 4 machines (or these machines which have switched on this option). NOTE: Only the Play command will be synchronized.
Synch.all Cmds	"on" / "off"	Option like Synch.Play, all Tape Motion commands will be synchronized.
Cmd per Field	"on" / "off"	Because of the limitation of some VTRs in "on" state only one operating command per field will be transmitted.
Timecode	"LTC" / "CTL"	Selecting the timecode mode

Special Machine Control Options - AMP Protocol

Figure 83. ODETICS Protocol Options



Variable speed options: “m-series”, or“default”.

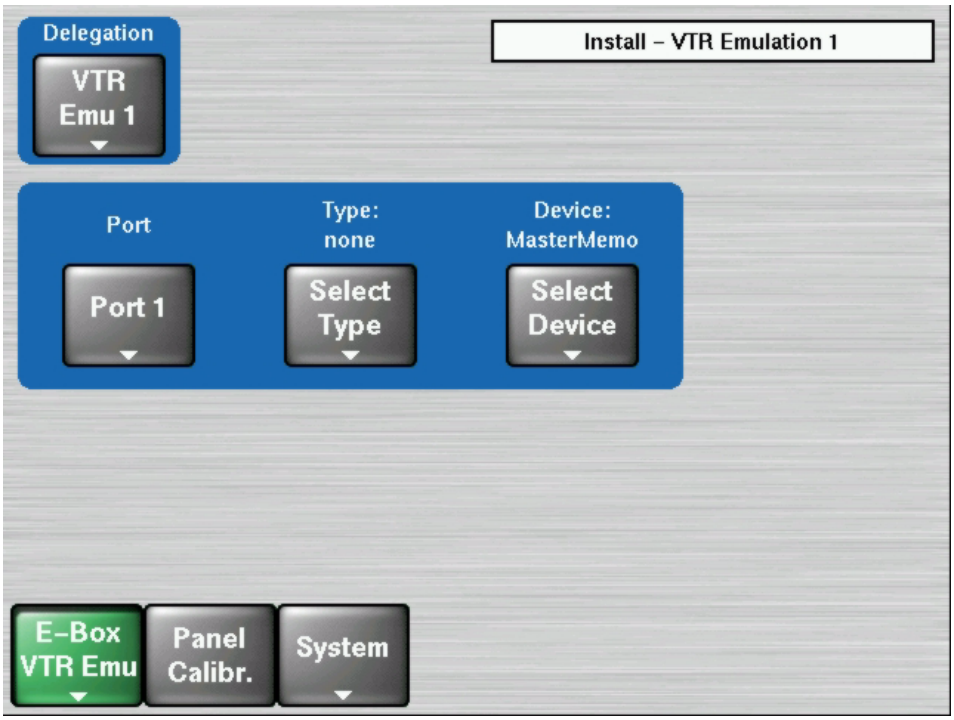
If an M-Series server cannot be controlled by using the Variable Speed controls with in the Sidepanel PC or the Kayak HD panel menu, select the option “m-series”.

Install - VTR Emulation Menu

VTR Emulation provides a mechanism to control internal VTR based switcher components by external editors using the BVW75 protocol. VTR based components in Kayak HD are TiM/E-MEMo (Master, PP, ME1) and RAM Recorder (Channel 1 - 6).

It is possible to control up to 5 component instances simultaneously.

Figure 84. Install – VTR Emulation



To setup an VTR emulation session, select the number of the serial Kayak HD port (**Port** button) that is connected to a corresponding serial port of the editor. Select the BVW75 protocol with the **Select Type** button. After the internal component is selected (**Select Device** button), the chosen switcher instance can be controlled by the editor device. To setup additional sessions use the **VTR Emulation Delegation** button.

Note Port and protocol type are environment data and therefore independent from loading and saving an application. In contrast the type of the internal component to control is stored within an application.

Figure 85. Install – Select VTR Emulation

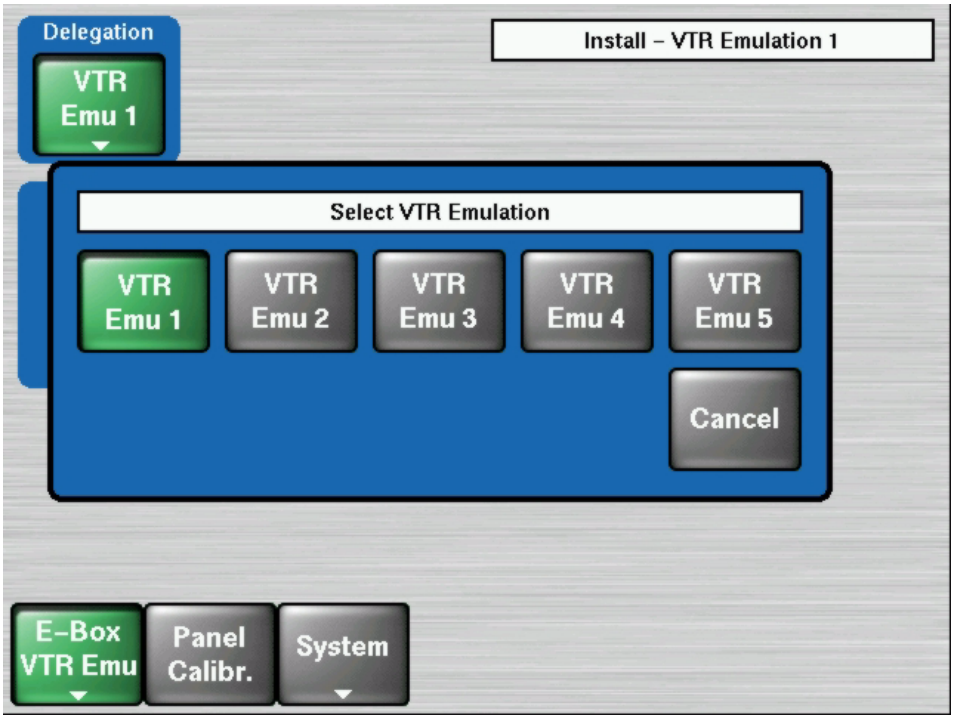
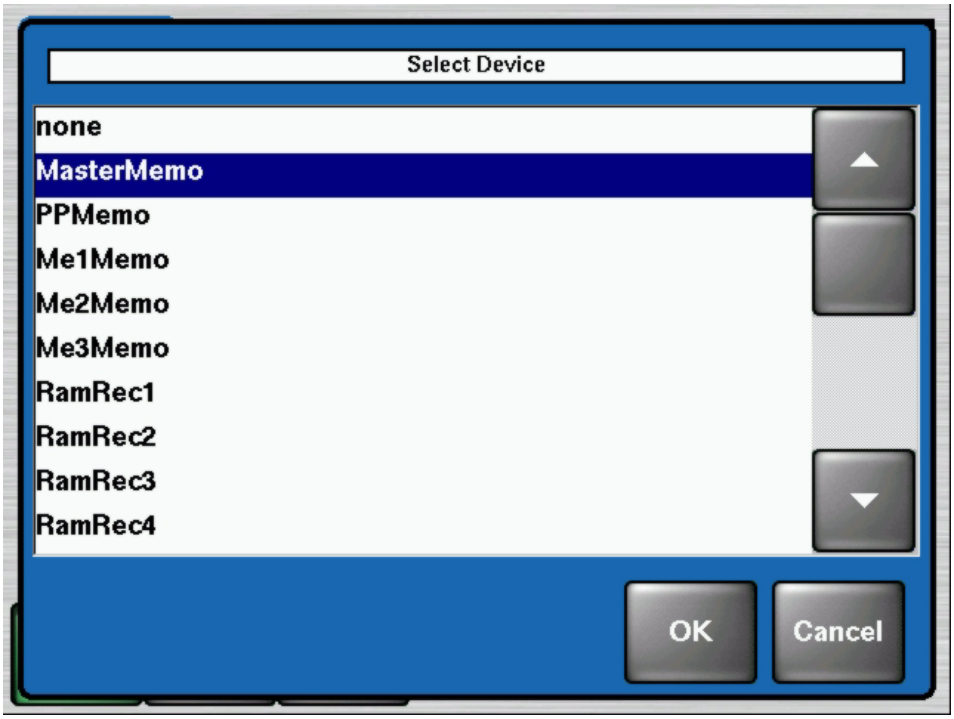
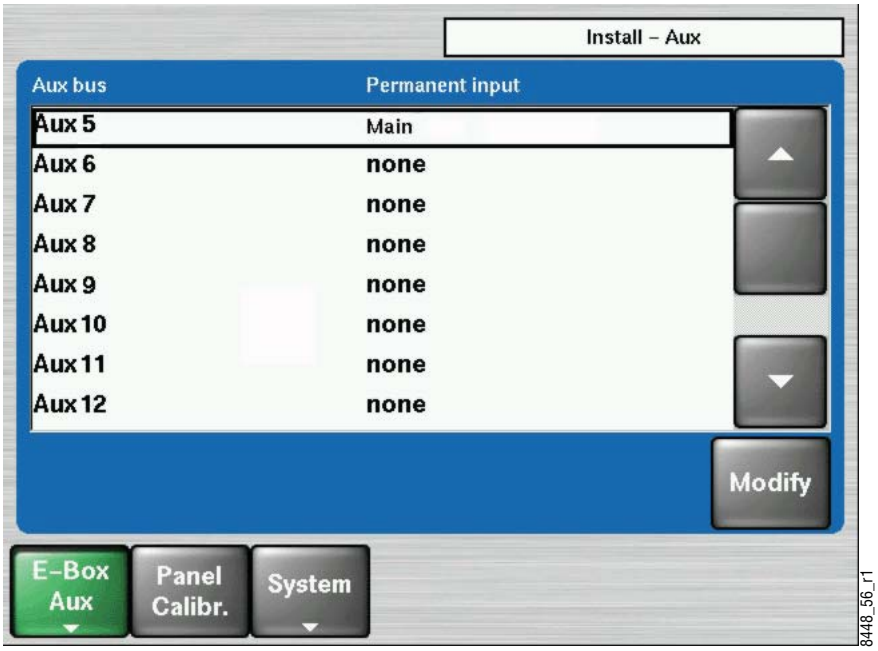


Figure 86. Install – Select VTR Emulation Devices



Install – EBox - AUX Menu

Figure 87. Install – AUX Menu



Use the **Install - EBox - AUX** menu to assign permanent sources to Aux output BNCs. There are 12 outputs per M/E board and they can be assigned to any of the internal M/E or Program Preset outputs as well as AUX busses.

Note If an AUX bus has been assigned a permanent internal source selection the main control panel for that AUX bus is locked out.

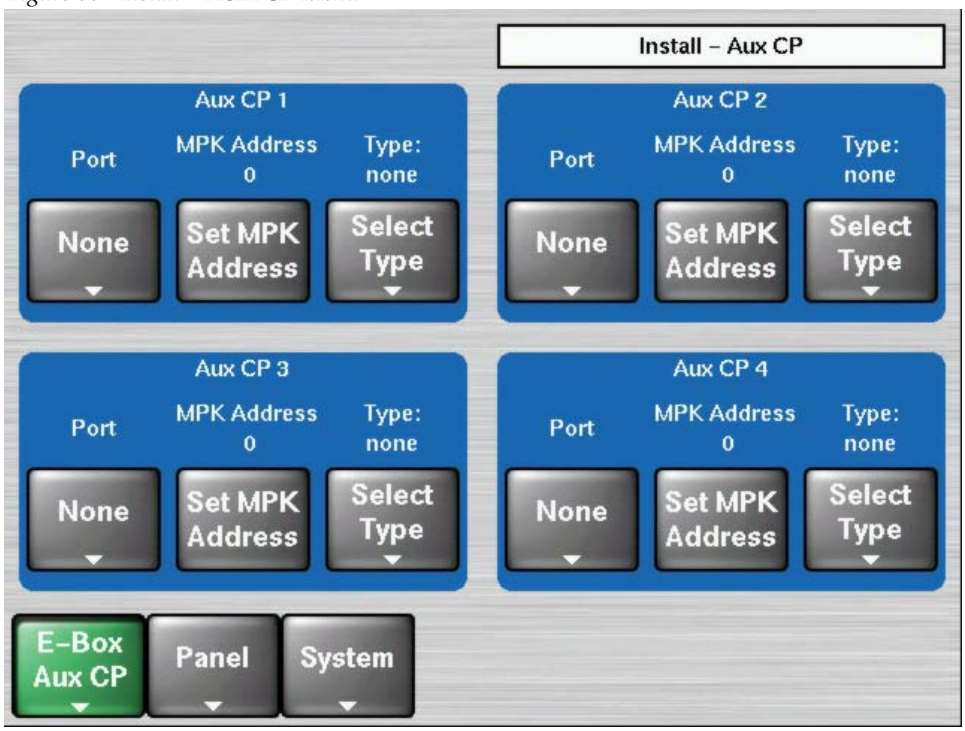
Table 10. Source Names and Descriptions

IN01 - INXX	Default names of input BNCs, with XX = 48 on 4RU HD, 96 on 8RU HD. Names can be changed by the user.
BLCK	Internally Generated Black
COL1-3, T	Background Generator 1-3, Test Generator
WHIT	Internally Generated White
RAM 1-6	Ramstore 1- 6
MAIN	Program M/E Program
PVWP	Program M/E Preview
CLNF	Program M/E Clean Feed
PPCP	Program M/E Clean Feed Preview
ME1	M/E 1 Program
PVW1, M1CF, M1CP	M/E 1 Program. Preview, Clean Feed, and Clean Feed Preview
ME2-3, PVW2-3, M2-3CF, M2-3 CP	Pgm, Pvw, Clean Feed, and Clean Pvw for other M/Es
MEH	Half M/E Program Output
PVWH, MHCF, MHCP	Pvw, Clean Feed, and Clean Pvw for Half M/E
VR00 - VR15	Virtual Sources 1-15

Install - AUX CP Menu

The menu serves for installing the AUX Control Panels connected with the Kayak HD. Up to four AUX Control Panels can be installed.

Figure 88. Install – AUX CP Menu



Type

Touching the **Type** button opens a dialog with all supported types of AUX Control Panels.

Port

Touching the **Port** button opens a dialog with all ports plus ”None” like in all other menus where a port must be configured.

Note Note: The port must be different to the ports used for Routers, DVEs, Editors, Ext DSKs, etc.

MPK Address

MPK Address opens the typewriter. The physical MPK address of the AUX-CP must be entered. Refer the label at the rear of the panel modules (e.g. CP-3020: e0002d43).

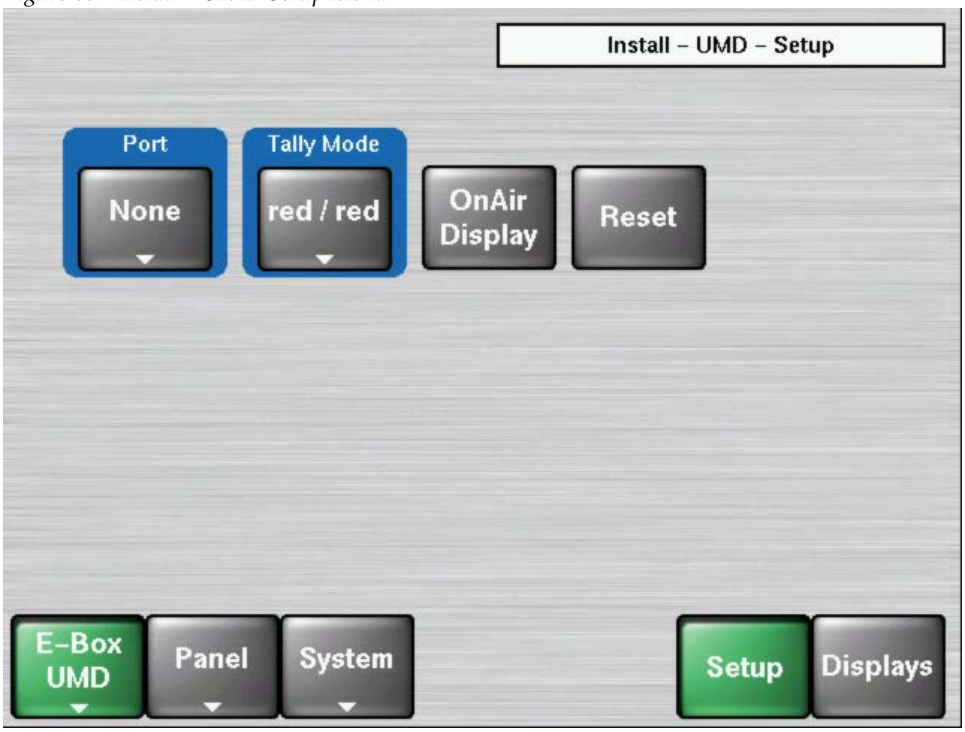
Install – UMD Menu

Grass Valley offers a wide range of programmable 8-character Under Monitor Displays, especially designed for use in Production Switcher applications and in Control Systems for indication of source names and Tally. Single, double and triple displays are available.

The standard modules offer green 8-character displays with red tally lights an both sides of the display, able to be switched individually on and off for yellow Tally. The latest versions comprise dual-color-8-character displays which will switch the source name characters from green to an intensive red for Tally indication.

The menu serves for installing the Under Monitor Displays connected with the Kayak HD and set the tally mode. For details refer to your Under Monitor Display manual.

Figure 89. Install – UMD Setup Menu



Port

Touching the **Port** button opens a dialog with all ports plus ”None” like in all other menus where a port must be configured.

Note Note: The port must be different to the ports used for Routers, DVEs, Editors, ext. DSKs, etc.

Tally Mode

- Red/Red: The LEDs of the UMD will signal a red tally.
- Red/Yellow: The right LED will signal a red tally and the left LED will signal a yellow tally.
- Red/Off: The right LED will signal a red tally and the left LED is not used.

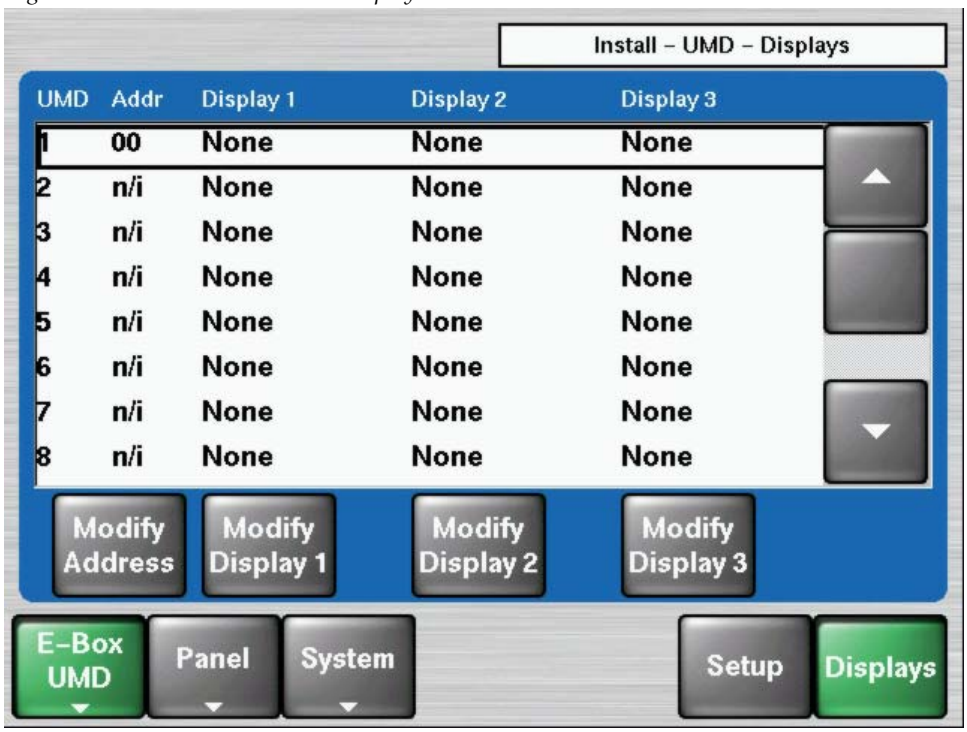
On Air Display

Touching the **On Air** button switches the tally signalization on or off.

Reset

Touching the Reset button set the display assignment to default values.

Figure 90. Install – Install UMD Display Menu



Modify Addresses

Select the device address (see the HEX switches on the rear panel of the UMD devices). The UMD devices will use only the LSB of the physical MPK addresses (which is a 32 bit address)

Valid range: 00 ... BF (FF disables the device handling = not installed).

For details refer to your Under Monitor Display manual.

Modify Display

Touching the Modify Display buttons opens a dialog to select a switcher bus. The name of the selected source on this bus will be displayed on the respective display of your UMD device

Install - Router Menu

The Kayak HD system can interface with an external routing system like Encore, Jupiter and Pro-Bel automation systems. A routing system connects a router source (router input) to a router destination (router output). Changing the router source sends a different signal to the destination (called a take). A router destination can in turn be connected to a KayakHD input and be configured as a routed KayakHD source (called switcher source in this discussion and in the Kayak menus). The router acts as a preselector for the switcher source, and so increases the number of inputs available to a button on a Kayak system bus.

An external router can be configured into levels, to allow the switching of multiple signals simultaneously. For example, video signals can be organized on one level, and key signals on another. By specifying both levels when giving a router take command, both the video and key signals of a source will be routed to their destinations.

Note Kayak system router take commands are applied to single or all router levels depended of the configuration. The external routing system's destinations must be configured correspondingly.

The following control features are supported in Kayak:

- Destination Assignment
- Level Assignment (Encore, Pro-Bel)
- Source name transfer
- Source name and configuration change notification

Router Control Interface Cabling

Connect an RS-422 9-pin serial cable from the Kayak Video Processor frame to Router or Router Control system.

Note Note Kayak system supports only serial RS -422 communications. Communication via Ethernet network is not supported!

Video Interface Cabling

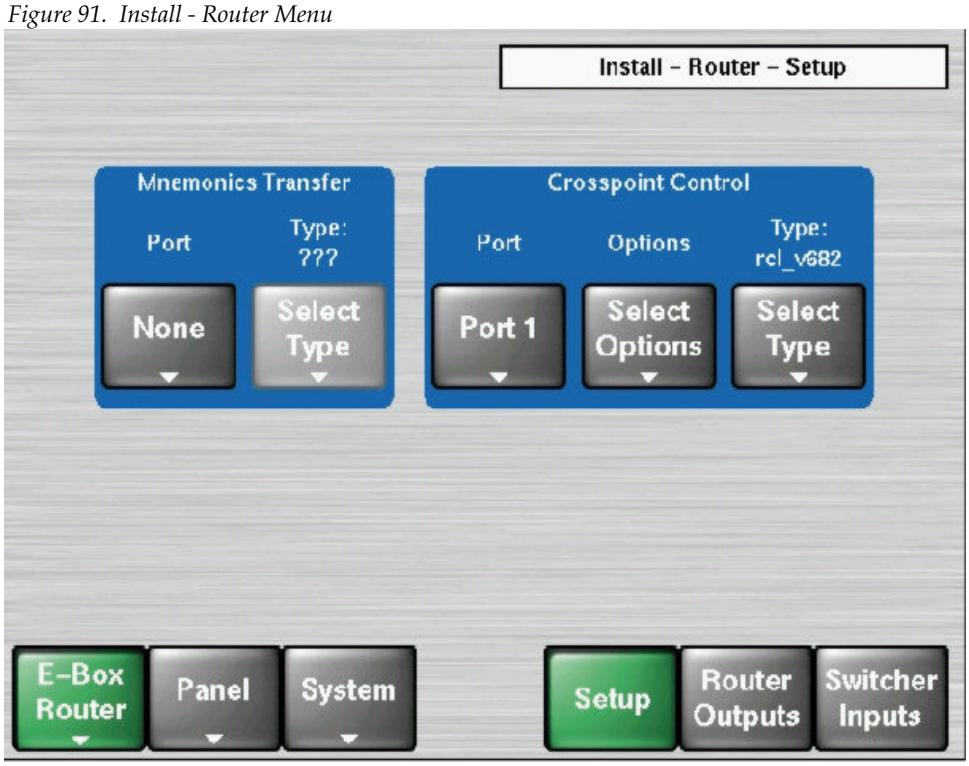
Connect each Router destination to an available input connector on the Kayak Video Processor frame. You will need to know the module and J number of each input connector used for each destination when you configure the Kayak source.

Kayak Router Installation Menu

The Install - Router - Setup menu is used to setup your Kayak for control of an external router system. In the Crosspoint Control pane the used serial port, the router protocol type and additional router options can be selected.

In the Mnemonics Transfer pane the additional necessary serial port for the source name transfer with **Jupiter** can be selected.

Figure 91. Install - Router Menu



Selecting a Serial Port

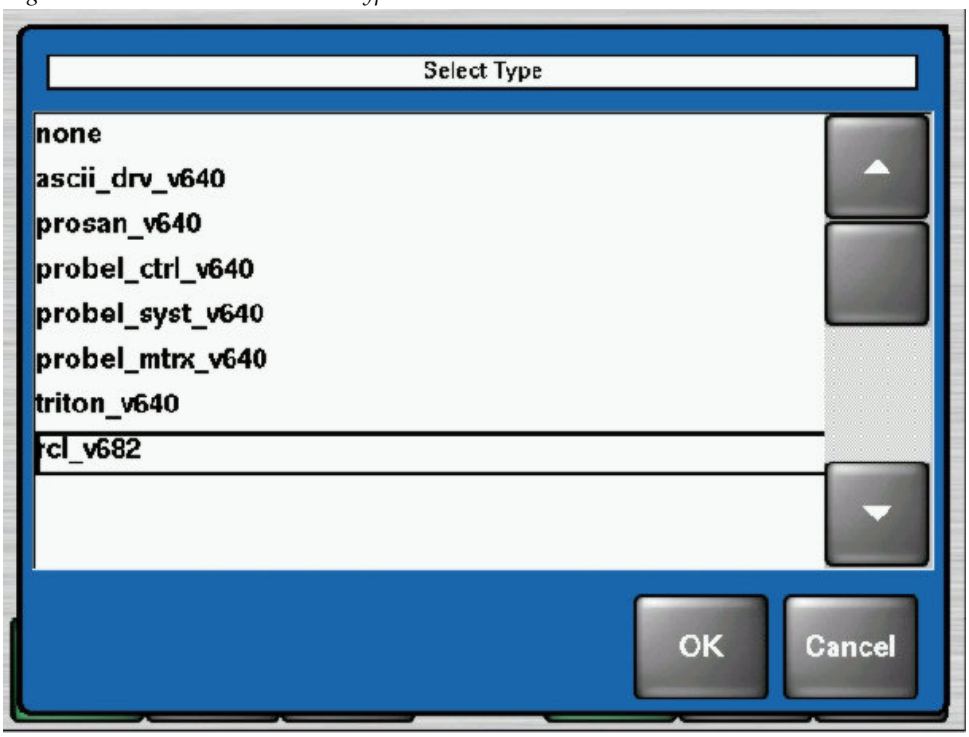
Touch the **Port x** button in the Crosspoint Control pane to assign one of the six (KayakDD) or eight (KayakHD) serial ports to the router control.

Note Kayak HD Port Setup Settings for Encore are RCL protocol, 38400 baud, 8 data bits, 1 stop bit, No parity, No flow control

Selecting Router Protocol

Touch the **Select Type** button in the Crosspoint Control pane to access the Select Type sub-menu. In this menu page all supported router protocols are listed.

Figure 92. Install - Router - Select Type Menu



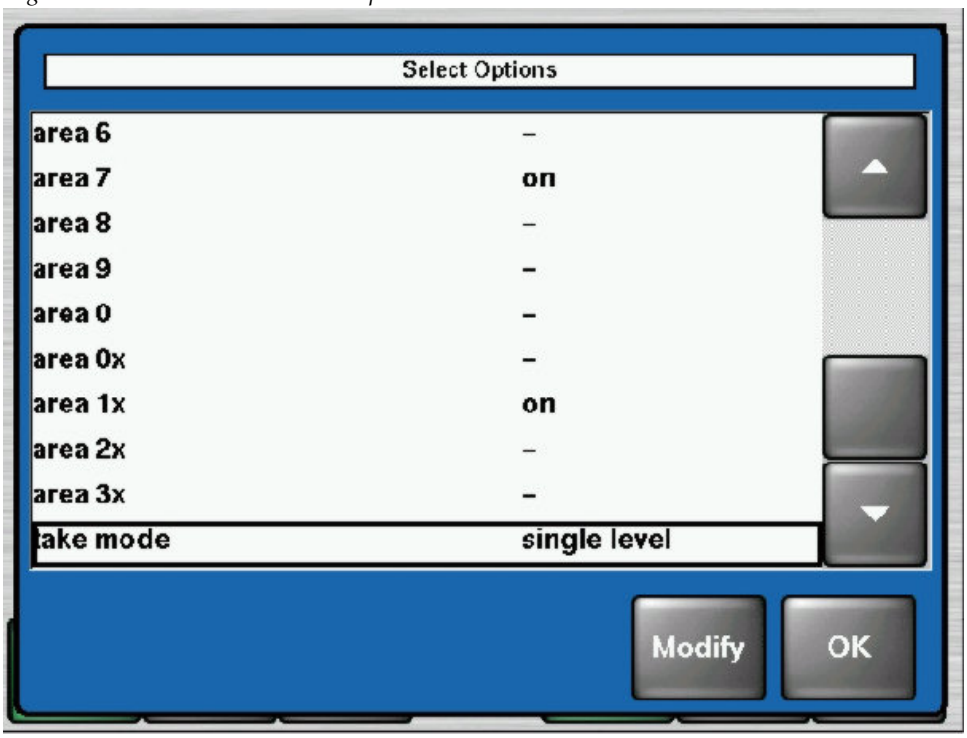
Note For Encore Router Control System select the “rcl_v682” protocol and touch the OK button. (“rcl” = Router Control Language, “v682” = current software version)

Selecting Options (RCL Only)

Touch the **Select Options** button in the Crosspoint Control pane to access the options sub-menu. In this menu page the Encore areas and a special operating mode can be selected.

Note Note Kayak's router control can address the Encore areas 1 to 39.

Figure 93. Install - Router - Select Options Menu



Definition of Areas

Areas create hierarchies within the Encore system and makes it easier to group sources and destinations in a large system. Once an area is defined, an area prefix is automatically assigned to each source and destination in the area by the router engine. This allows, for example, VTR_1 in the master control area to be named the same as a VTR_1 in the production area. The area prefix is part of the system name and can be displayed on certain panels. A user can configure up to 64 areas in an Encore system, but only area 1 to 39 can be controlled from Kayak! Typically, in most installations, a single area is used.

Selecting a Area Number

Enter the area number in two steps: First the tens column and than the ones column. Touching the **Modify** button toggles the state from off/on

- Areas 1 to 9 can be selected by touching the area0x button first and than the respective area0 … 9 button
- Areas 10 to 19 can be selected by touching the area1x button first and than the respective area0 … 9 button
- Areas 20 to 29 can be selected by touching the area2x button first and than the respective area0 … 9 button
- Areas 30 to 39 can be selected by touching the area3x button first and than the respective area0 … 9 button

Take Mode Selection

Select the **Take Mode** line and touch then the **Modify** button to toggle between the two modes of operation:

- **Single Level**: Only one level of the virtual matrix will be switched
- **All Level Take**: All levels of the virtual matrix will be switched

Note The behavior of this option depends on the configuration of the Encore system.

Take

Take is direct, immediate switching from one Source to another, occurring during the vertical interval for clean transition. The control operation which switches a Source or Sources to a Destination.

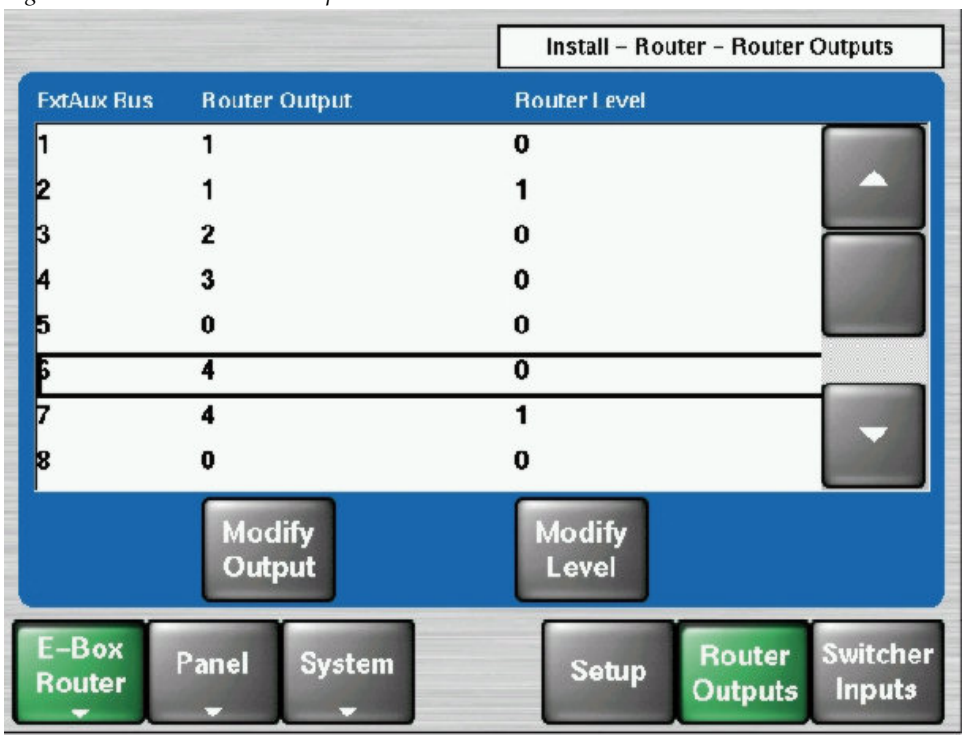
Levels

Levels are used during source configuration to setup up different signal formats, such as SD video, analog video, analog audio, digital audio, time code, and data. Levels are linked to logical matrices. Up to 32 levels are available within the Encore system. These levels are global across all areas.

Kayak Router Configuration Menu

The Install - Router - Router Outputs menu is used for destination assignment. On the Kayak there are up to 15 External AUX Buses which can be assigned (connected) to the router outputs (destinations). Once an External AUX Bus is connected to an router output, sources can be controlled (switched) by the Kayak switcher.

Figure 94. Install - Router - Outputs Menu



Selecting the Router Output

Touch the **Modify Output** button and select a number of the desired router output (destination):

1 = First destination of the external router
2 = Second destination of the external router
3 = Third destination of the external router
….
0 = Not used / Not connected = External AUX Bus is not assigned

Note The Destination numbers 1 to 255 can be entered and assigned to the 15 AUX Buses of the Kayak.

Selecting the Router Level

On some routers systems (Encore, Pro-Bel) it is possible to assign also router levels to a certain External AUX Bus.

Note The handling of levels depends on the configuration of the external router system!

Touch the **Modify Level** button and select a number of the router levels:

0 = First level of the external router

1 = Second level of the external router

2 = Third level of the external router

If Router Output and Router Level are configured, the external router can be controlled. Provided that the external router is configured accordingly!

Source Name Transfer

Source names can be transferred automatically from the external router system to the Kayak.

Note On Encore or Pro-Bel is no additional Protocol for Mnemonics Transfer necessary. If Jupiter is used as external router an additional Protocol has to be selected in the Install - Router - Setup menu!

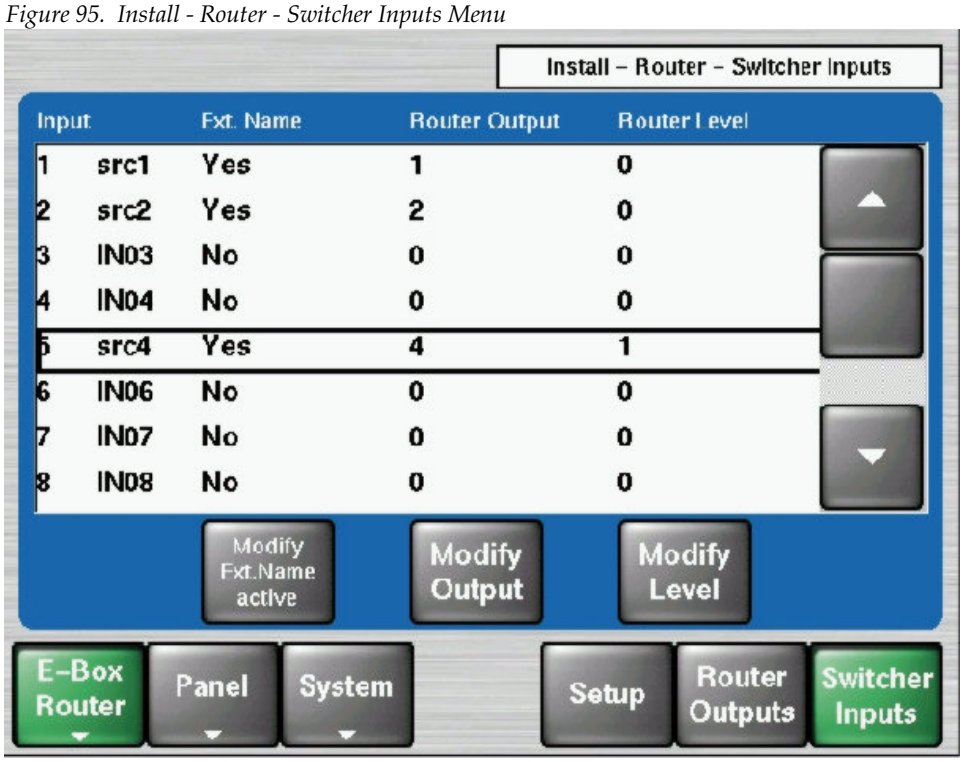
Control of External Routers

Control of external routers is possible by using the respective Kayak or Sidepanel menu only! To call the menu touch first the Router button in Kayak`s Home menu.

Additional Router Configuration

It is also possible to assign a certain Kayak input to an output of an external router system. When a source on this router output changed then the name of the input, which is connected to this router output, will also be updated (Name follow Video) in the input menu of the Kayak.

Figure 95. Install - Router - Switcher Inputs Menu



Touch **Modify Ext.Name** active to enable (Yes) or disable (No) the name transfer for each Kayak Input. Default names are IN01, IN02, …

Touch **Modify Output** to select a router output (destination) where the input should be connected.

Touch **Modify Level** to select a router level where the input should be connected.

Note The Default names of the Kayak inputs can configured in the Config - Input - Key Coupled menu only!

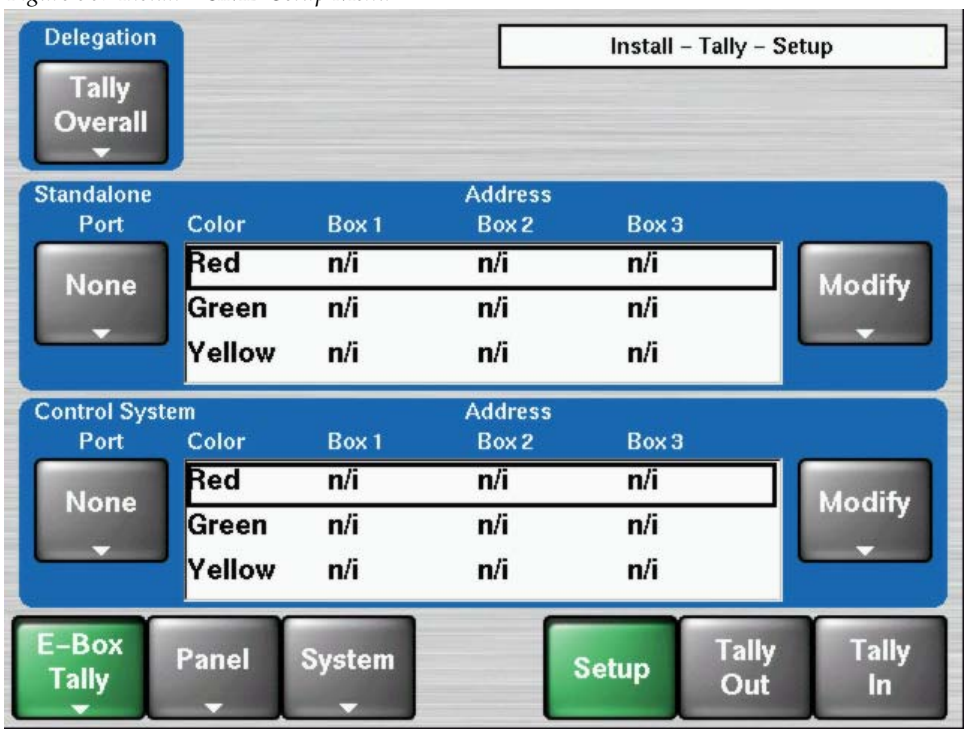
Install - Tally Menu

The tally signalling for the Kayak works via serial communication line with the option to hook a hardware device onto that (those) serial line(s) to provide tally for those cases where it is not connected to a control system, e.g. Jupiter from Grass Valley. For that optional hardware device the already existing Tally Distributor MI-3040 was chosen. This device is driven via the serial MPK protocol and has 40 opto-isolated inputs and 40 relay outputs. Because the maximum needed amount of inputs and outputs is greater than 40 more then one (up to three) MI-3040 boxes are needed.

The menus serves for installing the Tally Distributors connected with the Kayak HD. For installation details refer to your MI-3040 manual.

You can configure Tally outputs in the Kayak control panel software from the **Config - GPO/Tally** menu which is described in more detail in the separate *Kayak User Manual*.

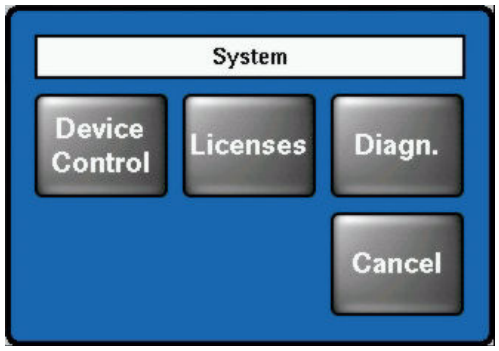
Figure 96. Install – UMD Setup Menu



System Setup Menu

The System Setup menus can be selected via the **Home – Install – System** menu.

Figure 97. System Setup Dialog



After touching the **System** button a new dialog appears with the following setup items:

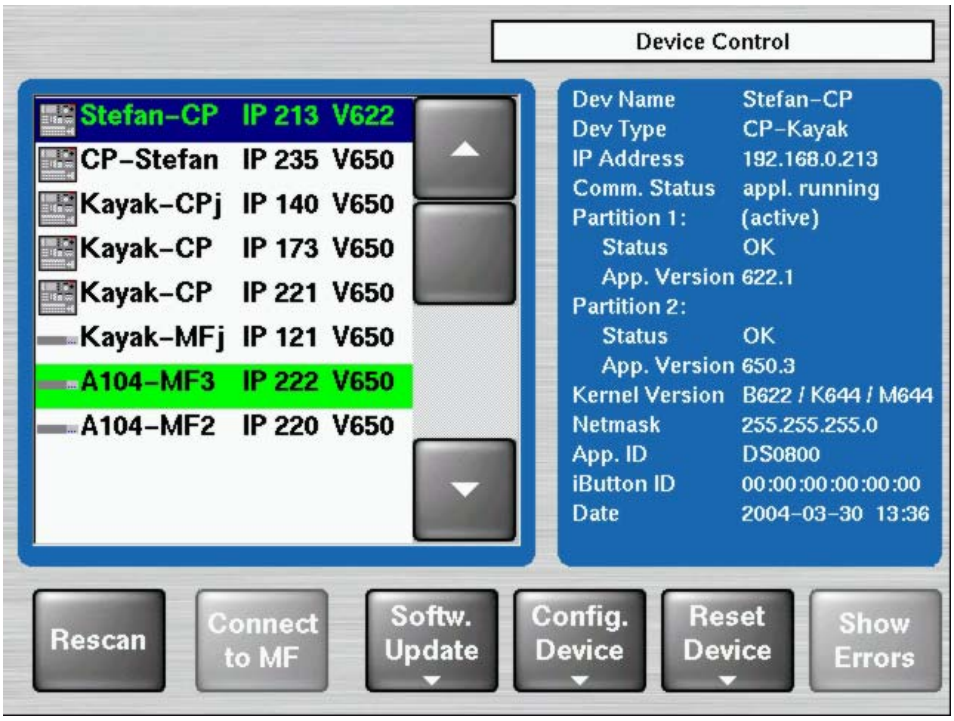
- Device Control
- Licenses
- Diagnosis

Device Control Menu

The Device Control menu shows on the left all in the network connected devices (Kayak-MF = Mainframe, Kayak-CP = Control Panel) with IP address and software version installed.

On the right details of the selected device are listed.

Figure 98. Device Control Menu



- **Rescan** button

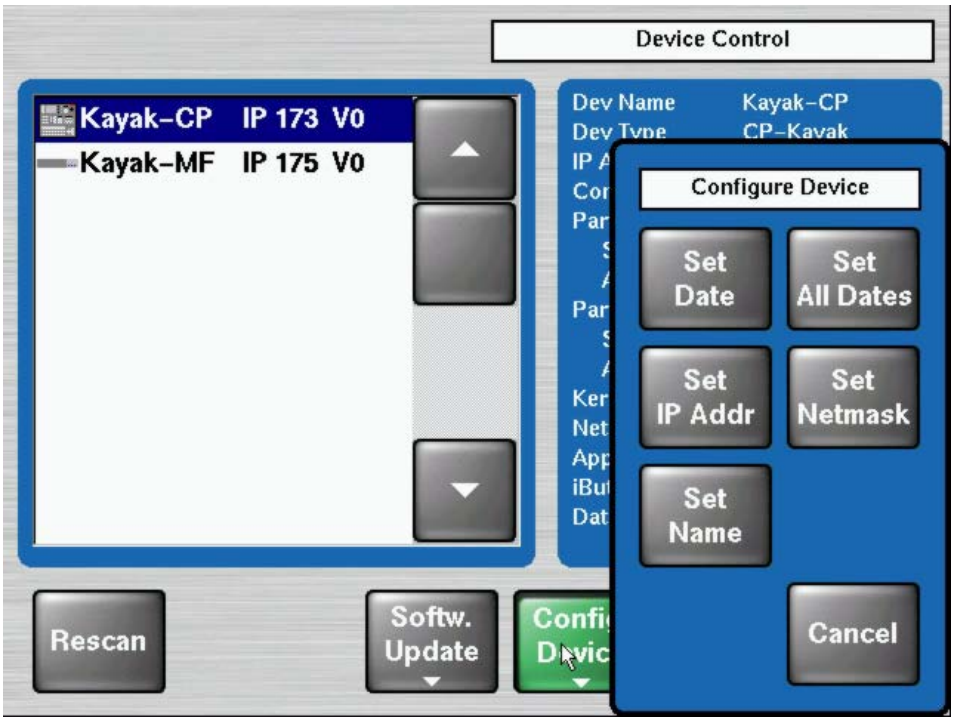
  The network will be scanned and all devices (CP=panels, MF=video processor frame) are listed with device name, IP address and software version installed.

- **Connect to MF** button

  This button is used to connect the control panel to the mainframe selected in the list.

Configure Device Menu

Figure 99. Configure Devices



The following device configuration data can be changed using the **Configure Device** menu:

- The date and time of the selected device (**Set Date**)
- The date and time of all connected devices (**Set all Data**)
- IP Address of the selected device (**Set IP Addr**)
- Net mask of the selected device (**Set Netmask**)

CAUTION This function should be used by a qualified network administrators only. Different netmasks for MF and CP lead to limited communication between the net devices.

- Logical device name (**Set Name**). The default logical device names are **Kayak-MF** or **Kayak-CP** but these can be changed if desired

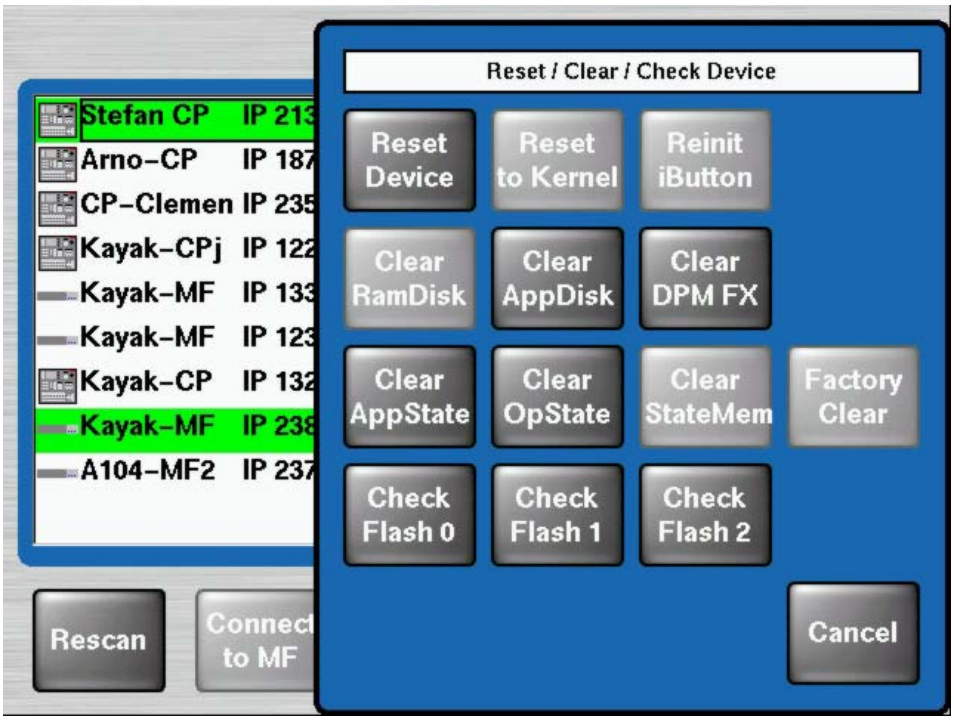
Reset / Check / Clear Device Menu

The **Reset/Check/Clear Device** menu should be used only by qualified users. It can be used to configure these functions with the buttons listed:

- **Reset to Kernel** (Reset Device)
- **Reinit iButton** (Reset Device)

- Re-initialize the RAM disk area on the flash (**Clear RamDisk**)
- Re-initialize the Application disk area on the flash (**Clear AppDisk**)
- Re-initialize the DPM FX disk area on the flash (**Clear DPM FX**)
- Deleting the Application State (**Clear AppState**)
- Deleting the Operational State (**Clear OpState**)
- Re-initialize the State Memory Partition (**Clear StateMem**)
- Factory Clear
- File system check of four flash partitions (**Check" Flash 0…2**)

Figure 100. Reset/Clear/Check Devices Menu



Note The reset and clear functions with bright gray buttons are protected against unintentional starting. The button will be activated by pressing **Menu Lock + Reset Devices**.

Section 4

Maintenance

Introduction

This section provides routine maintenance information for servicing the Kayak HD Digital Production Switcher, including software updates, updating the CPLD firmware, troubleshooting and diagnostics, control processor board replacement, and battery replacement.

Servicing Precautions

Before performing any type of maintenance or troubleshooting of the Kayak HD Digital Production Switcher, read the complete *Safety Summary* *on page 15* at the front of this manual. The *Safety Summary* describes all of the pertinent safety issues and recommended precautions for working with the Kayak HD Digital Production Switcher.

Tools Required

Some of the system installation tools listed in *Required Tools* *on page 33* may be required for maintenance procedures.

Grass Valley Customer Service FAQ Database

Many answers to common questions can be found by searching the Grass Valley Customer Support Frequently Asked Questions (FAQ) database. Instructions for accessing the FAQ database can be found in *Grass Valley Web Site* *on page 4*.

Grass Valley Web Site

The URL for the Grass Valley web site can be found on page 4. Visit the website for documentation, software updates, online support (including FAQs), spare parts information, and a link to the File Transfer Protocol (FTP) site.

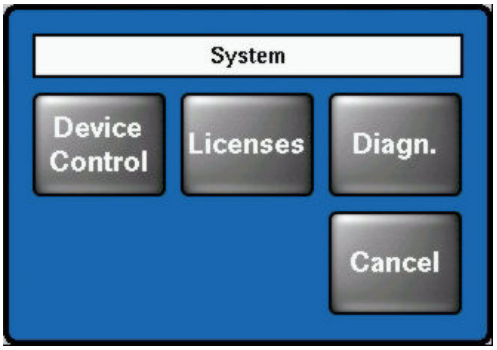
Troubleshooting and Diagnostics

The Kayak HD Digital Production Switcher is designed for ease of service and includes diagnostic functions for fast and effective troubleshooting of the system. This information is for troubleshooting a Kayak HD system that was installed and working properly prior to experiencing any failures.

Diagnosis Menu

The Diagnosis menu can be selected using the **Home – Install – System** menu.

Figure 101. System Setup Dialog Box

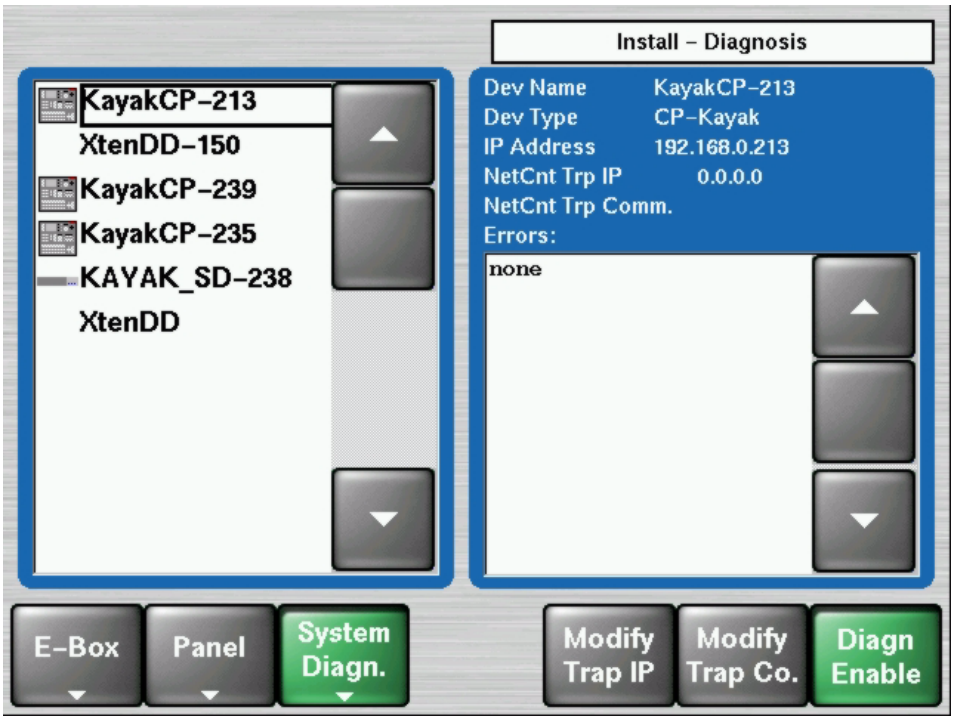


The Diagnosis system shows all internal Error Messages from the selected devices.

The button **Diagn Enable** enables / disables the diagnosis in the attached control panel or in the connected mainframe.

The menu is divided in two sections. In the left list field all devices (panels, mainframes) in the network are listed. Devices marked with a yellow warning symbol has produced internal error messages. After selecting the device the respective error messages are listed in right list field

Figure 102. Install Diagnosis Menu



NetCentral and SNMP Agents

The NetCentral system is a suite of software modules that work together to monitor and report the operational status of TV and video equipment from a NetCentral server PC and its network connected clients.

On each monitored device, there is a software module called an SNMP agent. The agent allows the device to collect and store management information (such as disk errors, temperature, video and audio status) and make this available to network management stations using SNMP (Simple Network Management Protocol). On a Kayak HD switcher, the agent is embedded in the system software.

On the NetCentral server PC, the NetCentral Manager software module is installed. NetCentral Manager is an SNMP manager application that performs all the centralized monitoring functions and provides the primary user interface. NetCentral Manager requires a software component called a device provider. The device provider provides device specific information to NetCentral Manager including information for a customized user interface to monitor device status and to set up monitoring parameters. A device provider must be installed for each type of device monitored. The

device provider files are copied onto the NetCentral server PC when the NetCentral manager software is installed, which makes the Kayak HD device provider available for installation from the local switcher.

Manually Configure the SNMP Trap Destination

The trap destination is the target for all status messages delivered from the Kayak system. To manually configure the trap destination you need the following information:

- The names of the SNMP communities to which the switcher belongs. Typically, this is set to `Public`. If you use other SNMP community names, make sure you set trap destinations for each one.

Note Kayak system supports at the time only `Public` (read only access) and `Privat` (read/write access) communities.

- The IP address of the NetCentral server PC which receives SNMP trap information.

Note The NetCentral PC must be installed in the same Sub-Net as all Kayak devices (control panel and video processing frame).

To check, add, edit, or remove trap destinations on the Kayak HD system:

1. Select the **Install – Diagnosis** menu.

   NetCnt Trp IP and **NetCnt Trp Comm.** are displayed in the right list field.

2. Select **Modify Trap Co** button to enter the community name or select **Modify Trap IP** to enter the IP address of the NetCentral PC.

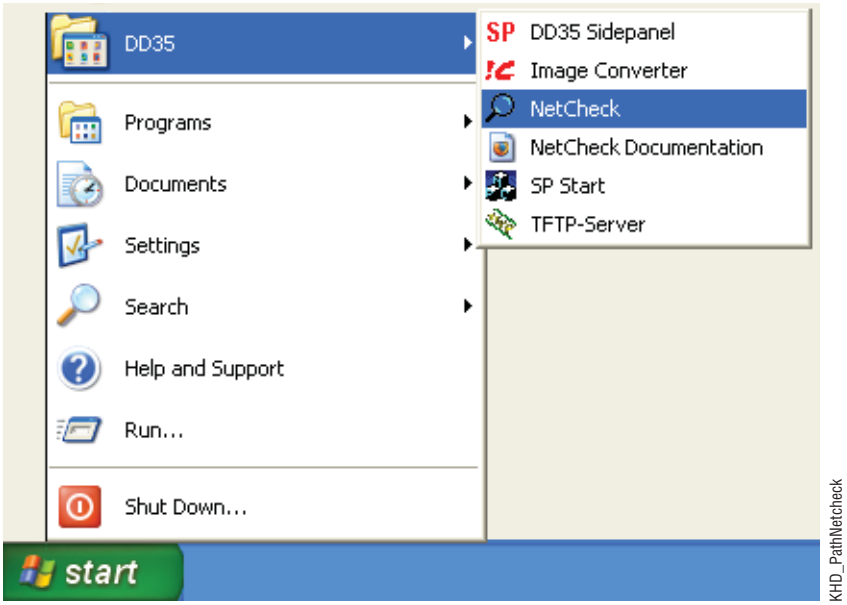
Network Problems with Sidepanel

After the installation of the Sidepanel software use the Netcheck application to test your connection and to analyze network stability.

1. Launch the Netcheck application from the Start menu following this path:

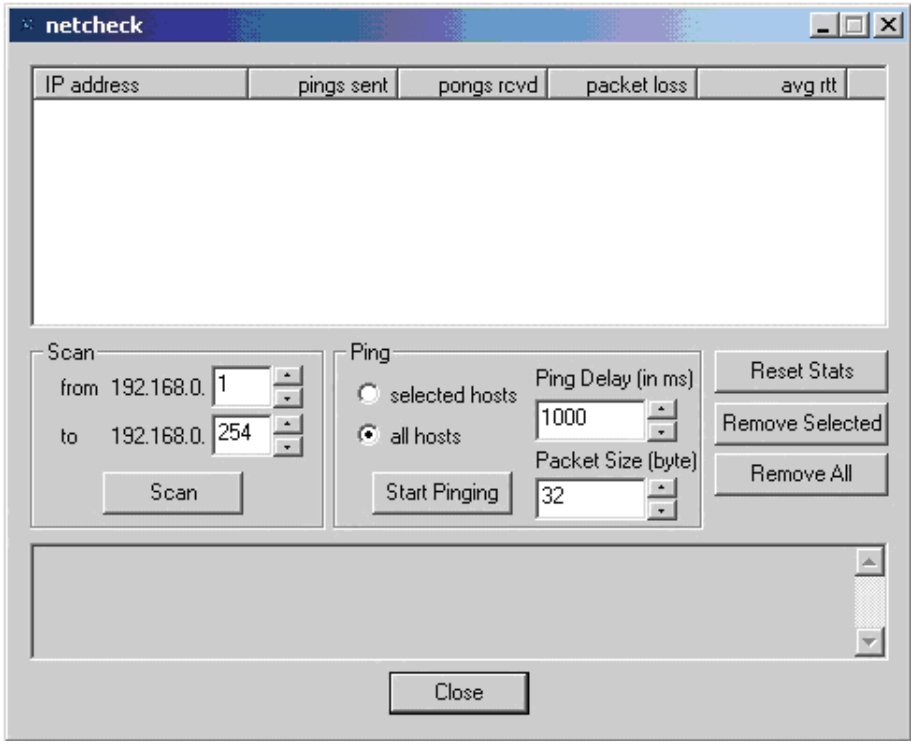
   Start - DD35 - Netcheck

Figure 103. Path to the Netcheck Software



After starting the program the Netcheck screen displays.

Figure 104. Netcheck Screen



2. The IP range can be changed if required. Click on the **Scan** button to display all network components in the IP address pane of the Netcheck window.

3. In the **Ping** section of the Netcheck window, click to select the checkbox for either

   - **selected hosts**
   - **all hosts**

   The default Ping Delay is 1000 ms and the default Packet Size is 32 bytes. You can change this setting if required.

4. Click on the **Start Pinging** button and the listing for the pings displays in the upper part of the Netcheck window. (The **Start Pinging** button toggles to **Stop Pinging**.)

5. When the required ping information has been obtained, click the **Stop Pinging** button. Grass Valley recommends that you test your connection using a minimum of 1000 pings to check for problems.

Note The packet loss should not be higher than 0.1%. If the packet loss is higher check your network. Possible reasons for network errors are unscreened cables, problems with switches and hubs, or a network segment with excessive traffic.

6. Click the **Reset Stats** button to reset the ping values in the upper part of the Netcheck window.

7. Click the **Remove Selected** button to delete any network components you have selected from the Netcheck window.

8. To scan the network again click on **Remove All** and then click Scan.

Note Firewalls and antivirus software may block computer network connections to the Kayak HD. Some operating systems have a separate internal software firewall that is turned on by default. If you are experiencing network problems try turning off all firewall and antivirus software including that which comes with the operating system.

Lost LAN Connection

If the panel has lost the IP address, and therefore does not connect automatically, you can re-connect to the frame.

1. Press these buttons all at the same time in the Transition panel:

   Black Preset + Trans PVW + Key3

   This switches the Effects subpanel into address entry mode.

2. Type in the last group of the frame IP address (Example: If the address is `192.168.0.70` type in `70`) and press **Enter**.

3. The panel will `load systemfiles` and should then re-connect to the frame.

Problems with Network Configuration

When an IP address of a Kayak HD frame has been changed in order to integrate the devices into an existing network and the subnet mask of the device does not fit to the mask of the network, the connection between frame and panel will be lost.

In this case establish a serial terminal connection to the frame and replace the IP address.

CAUTION This should be done only by qualified service personnel.

1. Open a command tool (terminal shell) and type in the following command:

   `sysIPAddressSet  "<old IP address>"`

   Example: `sysIPAddressSet "192.168.0.71"`

2. Press **Rescan** in the Device Control menu of the panel. The frame should now be visible.

3. If the frame is still not visible, reboot both the frame and the panel.

Note In order to integrate Kayak HD devices into an existing network, ask the local network administrator for the subnet mask of the network. Before changing IP addresses always set the subnet masks of all Kayak HD devices to the mask of the local network. If all changes are made and a frame is not visible to the panel, press **Rescan** in the control panel Device Control menu.

Network configuration defaults:

IP address frame (DD/SD/HD):	`192.168.0.70`
Subnet Mask frame:	`255.255.255.0`
IP address Ram Recorder (SD/HD):	`192.168.0.71`
Subnet Mask Ram Recorder:	`255.255.255.0`
IP address panel (1, 2, and 3 M/E):	`192.168.0.73`
Subnet Mask panel:	`255.255.255.0`

Running Panel Tests

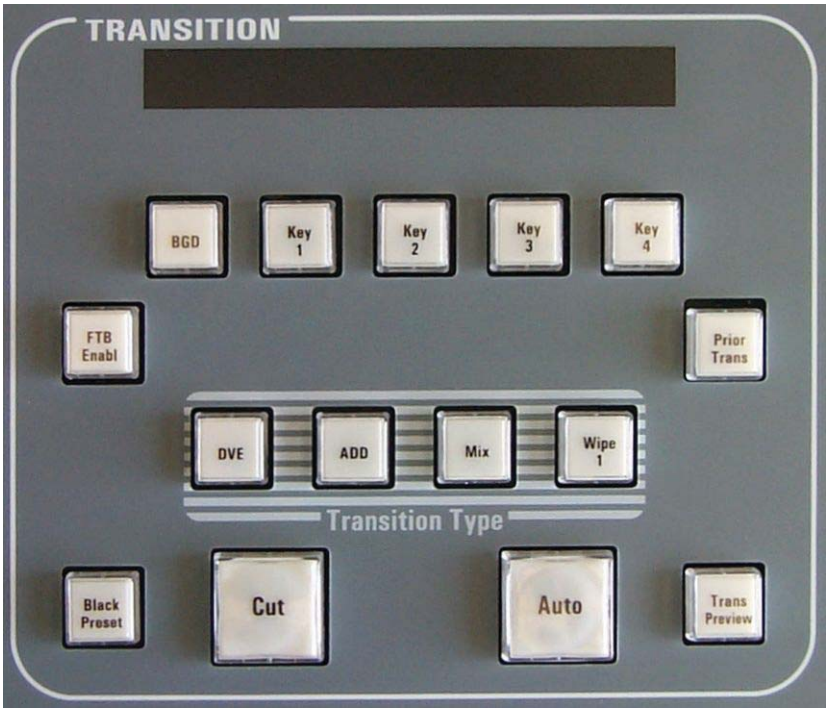
A series of test procedures are available to check the function of the Kayak HD Control Panels.

To run the Control Panel tests, simultaneously press the buttons:

BlackPreset + Trans Preview + BGD (or Key 1… Key 4)

in the **TRANSITION** control panel.

Figure 105. Kayak HD Control Panel Detail - Transition Panel



Local Panel Test Mode 1 (Button Test):

1. Simultaneously press the buttons:

   Black Preset + Trans Preview + BGD

2. Now press and hold down a button. This test displays the logical address of the button pressed.

Local Panel Test Mode 2 (LED Test):

1. Simultaneously press the buttons:

   Black Preset + Trans Preview + Key1

2. In this test the light for the button pressed is lit. The associated LEDs under the panel light when the button is pressed and held.

   Special test buttons:

BGD, Key1 - Key4	Turns on associated LEDs under the panel
Shift, Make (PGM+PST+Delegation)	Turns on the **Uncal** LEDs under the panel
Key1 Cut / Key4 Cut	Turns on the arrow (**Fader**) LEDs

Note The **Uncal** (Uncalibrated) light indicates that the selected source is out of legal timing range or that the video associated with the selected source is being processed.

Local Panel Test Mode 3 (Group Test / On Air Highlight Test):

1. Simultaneously press the buttons:

   Black Preset + Trans Preview + Key2

2. In this mode, whole button groups are switched on or off all at once by pressing any source button in the group. In the key bus, program and preset can be also switched between white and red by pressing any source button in that group.

Local Panel Test Mode 4 (Connect Mode):

1. Simultaneously press the buttons:

   Black Preset + Trans Preview + Key3

2. This is a method for connecting to a frame without using the Sidepanel software. Simply enter the last byte of the IP address and confirm by pressing the **Enter** key.

3. When you are finished exit the test mode by simultaneously pressing the buttons **Black Preset + Trans Preview + Key3**. This locks the frame so that no one can control it.

Local Panel Test Mode 5 (Color Test):

1. Simultaneously press the buttons:

   Black Preset + Trans Preview + Key4

2. In this mode select a key group on the Effects Subpanel, and then use the buttons **Key**1-**Key4** to select the different display colors.

Key1 = White

Key2 = Red

Key3 = Green

Key4 = Blue

Most groups have only white LEDs, but the four bus rows use both white and red and the number block uses all four colors.

Press the following transition buttons to change the brightness:

DVE Dark in large steps

ADD Dark in small steps

Mix Bright in small steps

Wipe Bright in large steps

Version Mismatch Button Test

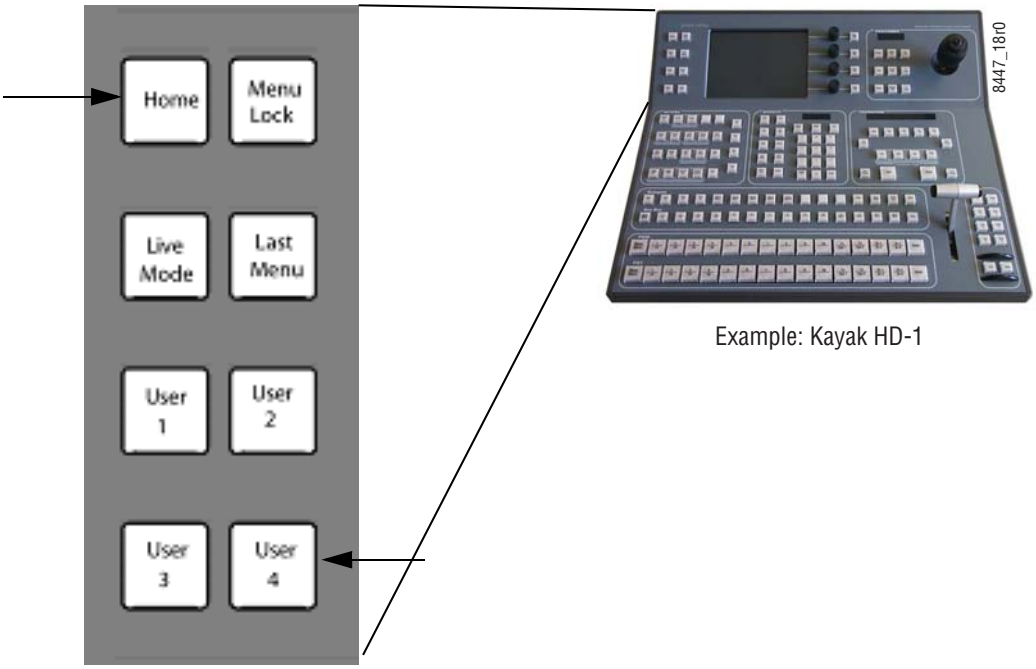
There are cases where the **Control Panel** software has been upgraded and the **Frame** has not. This can result in a version mismatch between the Frame and the Control Panel. If this is the case, the Control Panel will not fully boot (for example you may see a blank, white, or blue (empty) screen).

It is possible to force the Control Panel to display the **Device Control** menu during the boot process. If the Frame is missing from the Device Control menu, it is possible that there is a version mismatch.

To force the Control Panel to the Device Control menu, complete the following steps:

1. During the boot process, the **Home** and **User 4** (see Figure 106) buttons will begin to flash. *Immediately* after the *first* flash, press and hold both buttons and continue to hold them down until the Device Control menu is displayed.

Figure 106. Menu Subpanel—Home and User 4 Buttons



2. Examine the devices on the left in the **Device Control** menu to see if the **Frame** is present. If the Frame is not present, there may be a version mismatch.

3. Either upgrade the frame to the same software version as the Control Panel or downgrade the panel to the previous version. See *Version 6.9.3 or later, Kayak HD Release Notes* for information on updating the softoware.

4. Reboot the system.

Panel CPU Reset

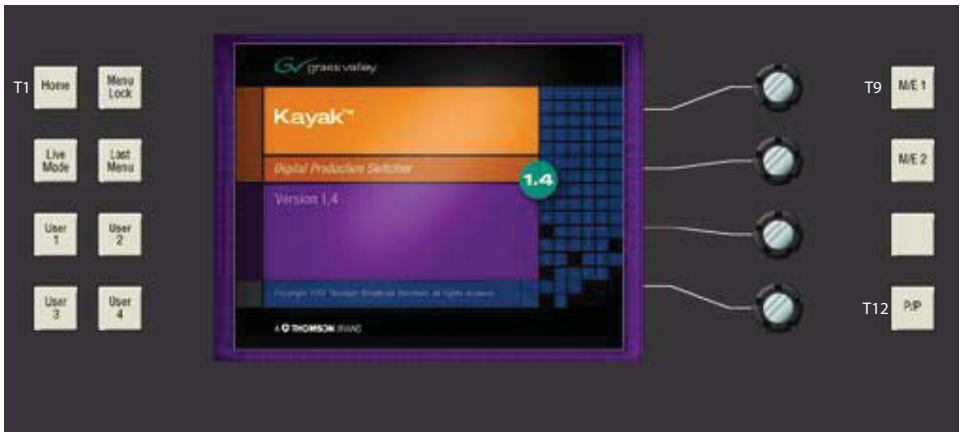
The original Kayak-1/-2 control panels needed a power cycle in order to reset the CPU. The new board set has provisions for resetting the CPU by pressing three pushbuttons simultaneously.

To reset the panel CPU, press pushbuttons T1 (Home), T9 (Top Delegation), and T12 (Bottom Delegation) simultaneously on the menu display module (see Figure 107).

Simultaneously press the buttons:

T1 + T9 + T12

Figure 107. Panel CPU Reset—Keys T1, T9, and T12



Fan Failure

CAUTION If a fan fails to operate it should be replaced immediately. The Kayak HD frame shuts down when its internal temperature reaches 75-degrees C.

If there is a fan failure, the network panel displays an exclamation mark (**!**). The fan board is hot pluggable (as are the power supplies and M/E boards).

CAUTION Do not attempt to run the Kayak HD system without functioning fans. This can cause sever damage to circuit boards.

HD RAM Recorder Field Upgrade Procedure

In addition to the 6.8.8 software, for a field upgrade of HD RAM Recorder on the Kayak HD, a new controller board (with DIMMs) and a software license must be installed.

Field Upgrade Parts List

To upgrade from an earlier version of software/hardware to install HD RAM Recorder, the following are required:

- New 6910000xx Controller Board.
- USB Memory Stick with the HD RAM Recorder license and current software
- One or Two 4GB DIMMS
  - One 4GB DIMM for HD RAM Recorder
  - One 4GB DIMM for KlipCache (optional)
- These release notes

Installing HD RAM Recorder Upgrade

CAUTION Use antistatic procedures to prevent electrical damage to sensitive electronic components.

To install the HD RAM Recorder upgrade on the Kayak HD, complete the following steps.

1. Back up all current applications and environmental data from the existing controller board to a USB stick or Sidepanel hard drive.
2. Install 6.8.8 or later software to the control panel and Sidepanel, and verify the installation.
3. Install the RAMREC license from the USB memory stick provided.

4. Save a copy of the RAMREC license on an external drive.
5. Carefully inspect the new controller board.
   a. Verify that no damage occurred during shipping.
   b. Verify that there are no bent connector pins.
6. Remove the battery isolation material from BT1 and verify that the battery ON/OFF switch is in the On position.

Note If the new controller board DIMM(s) are pre-installed from the factory, proceed to **Step 8**.

7. Install the DIMM(s) onto the new controller board.

Note When only using one 4GB DIMM, it must be in slot U11.

   a. Insert the 4GB DIMM into slot U11.
   b. If installing a second 4GB DIMM, insert it into slot U12.
8. Power down the Kayak HD frame by turning the power switch Off on the existing controller board.
9. Pull out the old controller board.

CAUTION Make sure the ON/OFF switch on the new controller board is in the **OFF** position.

10. Insert the new controller board in the frame slot from which the old board was removed.
11. Verify the software and license installation.
    a. From the **Home** menu, select the **RAM Recorder** button.
    b. The HD RAM Recorder license is displayed.
    c. The HD RAM Recorder memory size should also be visible, 4GB or 8GB.
12. Restore all applications and environmental settings.
13. Verify/set date and time
14. Verify Genlock settings.

The HD RAM Recorder upgrade is complete

Control Processor Board Replacement

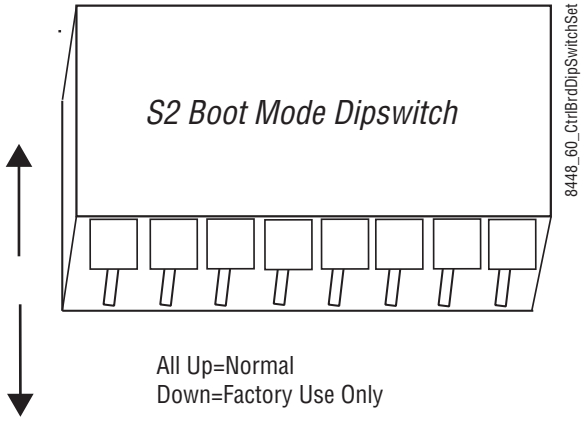
When replacing the 671-6630-00, 691-0000-00, or 771-0060-00 control processor board, in either the 4U or 8U Frame, verify that the S2 Boot Mode Dipswitch settings are all in the up or **Normal** position. The dipswitch is located next to the Flash card on the control processor board, as shown in Figure 108.

Figure 108. Kayak Control Processor Board - S2 Boot Mode Dipswitch Location

CAUTION If the Dipswitch settings are not in the up or Normal position, the system may not boot.

Figure 109 shows the S2 Boot Mode Dipswitch settings in the up or **Normal** position.

Figure 109. Kayak Control Processor Board - S2 Boot Mode Dipswitch Setting



Lifetime of the Internal Battery

Battery life of the Kayak HD internal battery is dependent on the operating time of the switcher.

Table 11. Lifetime of the Internal Battery

Capacity	GV #	Type
1000 mA/h	146013800	CR 2477

Note If the switcher has a low battery and cannot save the date and time, a low-battery warning displays in the **Install System/Device** screen as a yellow triangle with an exclaimation point (!) in it. Touching on the yellow triangle will display what type of warning it is, for example; battery, fan, power supply warning, etc.

Changing the Batteries

Change the Kayak HD Frame Battery

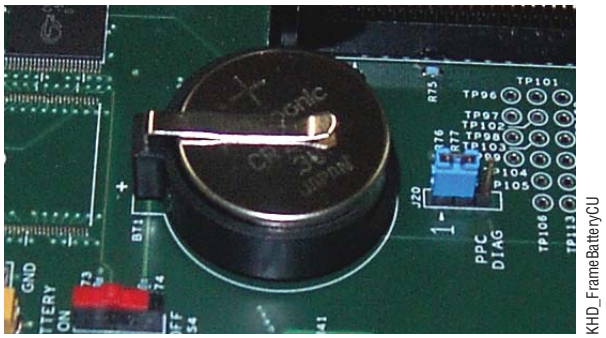
CAUTION **Operate the Kayak HD frame only with covers and enclosure panels in place** — Do not operate this product when covers or enclosure panels are removed.

WARNING **Be very careful when opening the Kayak HD frame door. Take precautions to avoid electrical shock from components by following the safety precautions described in detail in *Warnings* *on page 16* and in *Cautions* *on page 17*. In particular you want to avoid the possibility of electrical shock by powering down the system and unplugging all equipment before working on internal components. In addition you should wear a grounding strap to prevent electrical damage to sensitive electronic components.**

1. Turn off all power to the frame before opening it.
2. Using a grounding strap, open the door to the Kayak HD frame and remove the controller board.

Figure 110. Kayak HD Frame Controller Board with Battery in center of board

Figure 111. Kayak HD Frame Controller Board Battery

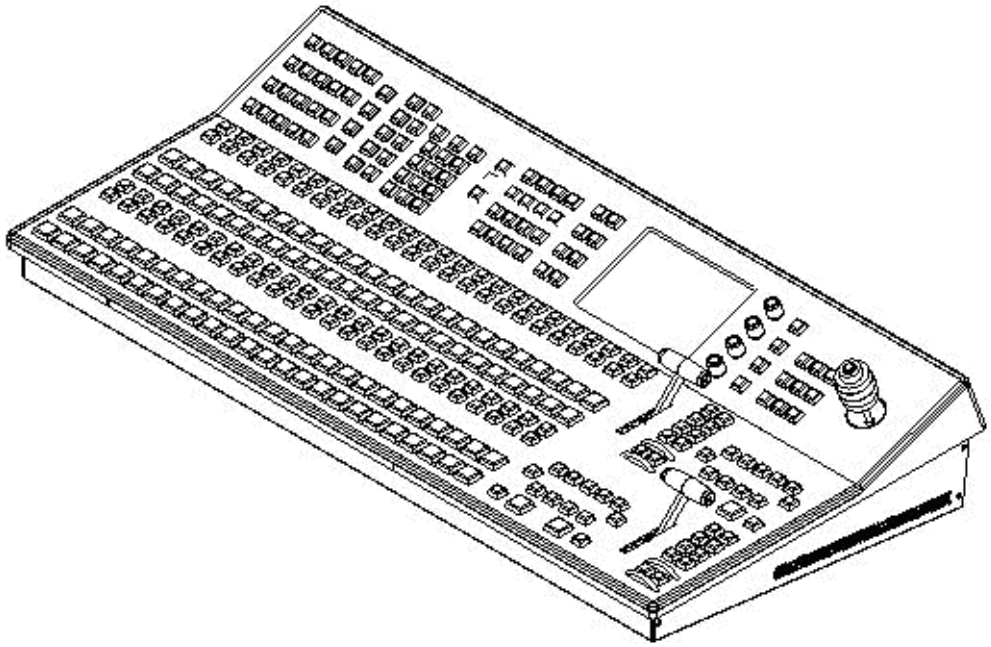


3. Remove the old battery by lifting the clip holding it in place.
4. Put the new battery in place and secure the clip.
5. Re-insert the frame controller board and close the frame door.
6. Check the frame BIOS after replacing the frame battery using the procedure described in *Frame BIOS Settings* *on page 165*.

Change the Kayak HD Control Panel Battery

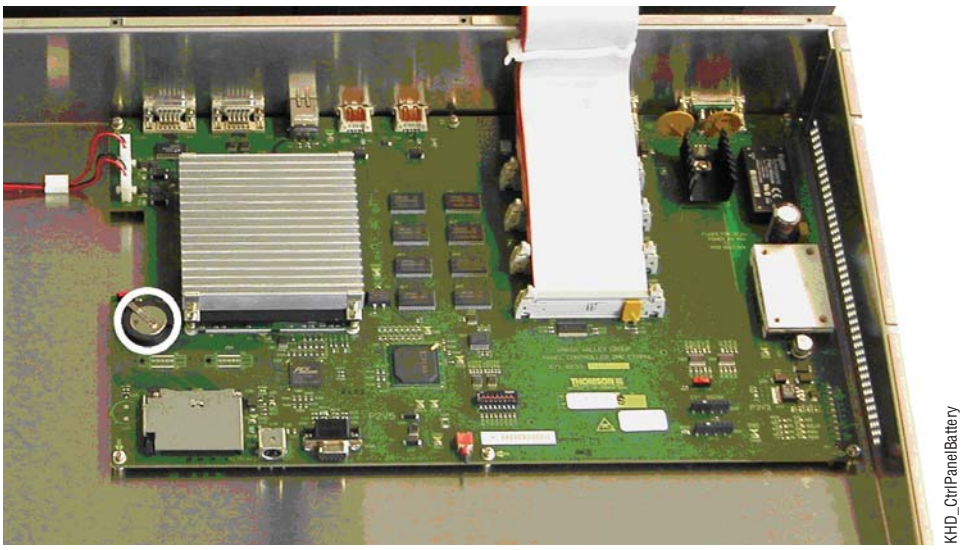
1. Loosen the sixteen screws around the control panel.

Figure 112. Kayak HD Control Panel (2 M/E Panel)



2. When all screws are loosened, lift the top of the panel carefully. The battery is located on the side of the internal CPU board.

Figure 113. Battery on the Control Panel CPU Board

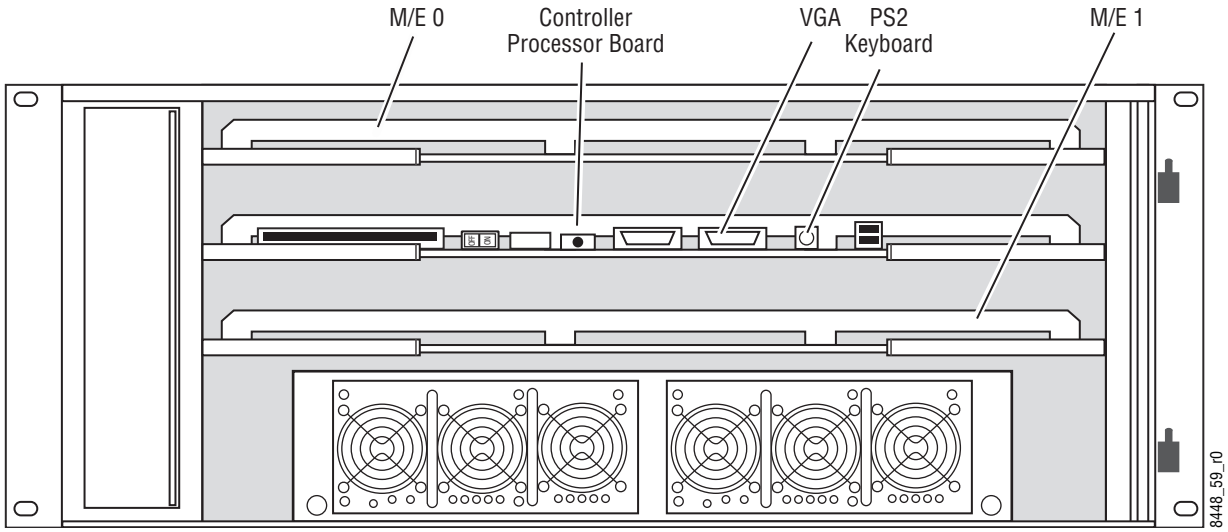


3. Remove the old battery by lifting the clip holding it in place.
4. Put the new battery in place and secure the clip.
5. Close the panel and fasten all screws.
6. Check the panel BIOS after replacing the panel battery using the procedure described in *Panel BIOS Settings* *on page 166*.

BIOS Settings

Frame BIOS Settings

Figure 114. Side View PS/2 and VGA Sockets on the Kayak HD Controller Processor Board



1. Connect a computer keyboard to the PS2 connector on the frame controller processor board and a computer monitor VGA plug to the VGA socket.
2. Press and hold the **F2** key immediately while booting the switcher to display the BIOS Menu.
3. Load **BIOS Setup Default** with the key **F9** and confirm by clicking **Yes**.
4. Select the **Advanced** menu.
   a. Select **PCI/PNP Configuration** and press **Enter**.
   b. Set **PNP OS Installed** to **No**. Press **ESC** to return to the **Advanced** menu.
5. In the **Advanced** menu select **I/O Device Configuration** and press **Enter**.
   a. Set **Legacy USB Support** to **Disabled**.
   b. Set **Serial Port A** to **Enabled**.
   c. Set **Serial Port B** to **Enabled**. Press **ESC** to return to the **Advanced** menu.
6. Select the **Power** menu at the top of the screen.
   a. Set **Enable ACPI** to **No**.

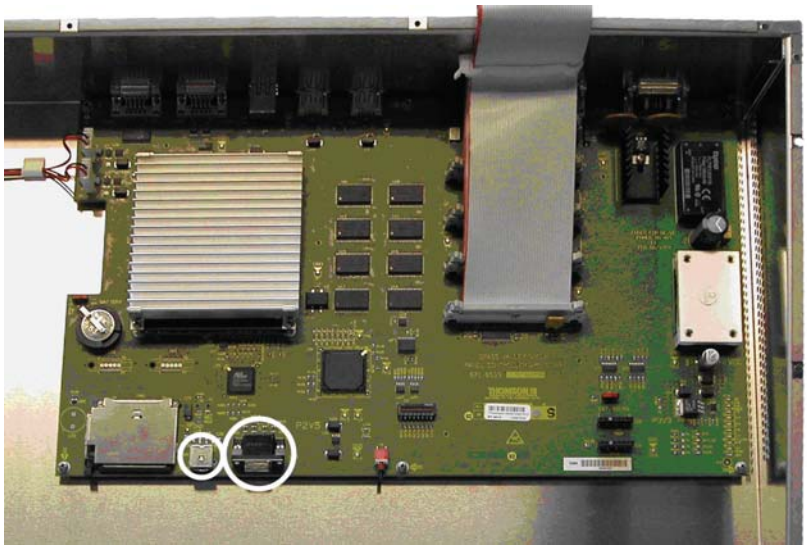
7. Select the **Boot** menu at the top of the screen.
   a. Select **Sandisk** (or **Removable Devices**) and make sure it is the first priority in the Boot menu. (This is the Compact Flash Card installed on the Kayak HD frame.)

Note The **Hard Drive** acts as the Primary Master for booting even if the **Compact Flash Card** is positioned at the top of the boot arrangement.

8. Press the **F10** Key and then press **Enter** to select **Yes** and save the new BIOS settings.

Panel BIOS Settings

Figure 115. Top View PS/2 and VGA Sockets on the Kayak HD Panel



1. Connect a computer keyboard to the PS2 connector on the frame controller processor board and a computer monitor VGA plug to the VGA socket.
2. To display the **BIOS** Menu, press the **F2** key while the switcher is booting.
3. Load **BIOS Setup Default** with the key **F9** and confirm with **Yes**.
4. In the **Advanced** menu set the options **PNP OS installed** and **Halt On Errors** to **No**.
5. In the **Advanced - Advanced Chipset Control** menu change the display settings in the menu **Boot / Display Control** by setting the **Display Mode** option to **CRT only**.
6. In the **Advanced - PCI Configuration** menu change the **PCI-Interrupt Settings** by setting line 1 of the **PCI IRQ** option to `10`.

7. In the **Advanced - I/O Device Configuration** menu enable both the **Legacy USB Support** option and the **USB Host Controller** option.

8. In the **Boot - Boot Device Priority** menu modify the boot arrangement so that **Removable Devices** is first followed by the **Hard Drive (**as the Primary Master). The boot order of other devices is not important.

Note The **Hard Drive** acts as the Primary Master for booting even if the **Compact Flash Card** is positioned at the top of the boot arrangement.

9. Save the changed BIOS settings with Key **F10** and confirm with **Yes**.

Appendix A

Specifications

Kayak HD Systems

Table 12. Kayak Mechanical Specifications

Component	Depth	Width	Height	Weight [a]	Rack Units
Control Surfaces					
Kayak HD 100C	418 mm (16.5 in.)	448 mm (17.6 in.)	145.80 mm (5.74 in.)	7 kg (15.4 lbs)	n/a
Kayak HD 150C, 200C, 200	418 mm (16.5 in.)	809 mm (31.8 in.)	145.80 mm (5.74 in.)	10 kg (22 lbs)	n/a
Kayak HD 250C, 250, 300	544 mm (21.42 in.)	1132 mm (44.57 in.)	162 mm (6.38 in.)	18 kg (39.68 lbs)	n/a
Frames					
Kayak HD Compact 4 RU Frame					
Kayak HD 100C and 150C	546.10 mm (21.5 in.)	482.60 mm (19 in.)	177.8 mm (7 in.)	16.33 kg (36 lbs)	4
Kayak HD 200C and 250C	546.10 mm (21.5 in.)	482.60 mm (19 in.)	177.8 mm (7 in.)	17.69 kg (39 lbs)	4
Kayak HD 8 RU Frame					
Kayak HD 200 and 250	522.73 mm (20.58 in.)	482.60 mm (19 in.)	441.96 mm (17.4 in.)	29.03 kg (64 lbs)	8
Kayak HD 300	522.73 mm (20.58 in.)	482.60 mm (19 in.)	441.96 mm (17.4 in.)	30.39 kg (67 lbs)	8
KDD-PSU Remote Panel Power Supply Option	240 mm (9.45 in.)	482 mm (19 in.)	44 mm (1.73 in.)	2.8 kg (6.2 lb.)	1

[a] All weights approximate.

Table 13. Environmental

Storage temperature	-20 to 70 deg C (-4 to 158 deg F)
Operating temperature	0 to 40 deg C (68 to 104 deg F)
Relative humidity	0-95% (non-condensing)
Electromagnetic environment	E2 (according to EN55103-1, -2)

Table 14. Control Panel Connection

Type of connection	10/100 Base T
Protocol	TCP(UDP)/IP
Cable and connectors	CAT5 UTP, RJ45 connectors;
Max. Cable Length	100m / 300ft
1 Frame and up to 4 Panels connect without use of external hub/switch.	

Table 15. Power

4 RU Frame	
Line voltage	100V-240V AC +/-10% autorange, power factor corrected. Automatic line-voltage sensing for 120V and 240V sources.
Line frequency	50/60Hz +/- 5%
Power consumption	max. 400W
Leakage current	< 2.5 mA
DC-OUT for control panel	48V DC, max 3A
8 RU Frame	
Line voltage	100V-240V AC +/-10% autorange, power factor corrected. Automatic line-voltage sensing for 120V and 240V sources.
Line frequency	50/60Hz +/- 5%
Power consumption	max. 800W
Leakage current	< 2.5 mA
DC-OUT for control panel	48V DC, max 3A
Kayak HD 100C Control Panel	
DC-IN	48V DC In, max 1.3A
Kayak HD 150C, 200C, 200 Control Panel	
DC-IN	48V DC In, max 1.3A
Kayak HD 250C AND 250 Control Panels	
DC-IN	48V DC In, max 1.3A
Kayak HD 300 Control Panel	
DC-IN	48V DC In, max 1.3A
KDD-PSU Frame (Remote Control Panel Power Supply)	
Line voltage	100V-240V AC +/-10%, power factor corrected
Line frequency	50/60Hz +/- 5%
Power consumption	max. 375W
Leakage current	< 2 mA at 250V AC

Table 16. Serial Digital Video Inputs

Format	ITU-R656, SMPTE 259M, 270Mbit/s. SMPTE 292M, 1.5Gbit/s
Number of Inputs	Kayak HD 100C, 150C: 24 to 48
	Kayak HD 200C, 250C: 48
	Kayak HD 200, 250: 48 to 96
	Kayak HD 300: 72 to 96
Return loss	> 15 db, 5 MHz to 1.5 GHz
Type of Connector	75 ohm BNC (SMPTE 259M)
Interface	HD Video Formats SMPTE 292M-1998
	SD Video Formats SMPTE 259M-1997
Nominal Amplitude	800mV peak-to-peak terminated
Autophasing range	TBD
Channel Coding	conforms to SMPTE 259M, SMPTE 292M
Ancillary Data	Blanked or passed (user selectable). NOTE: Video passing through Scalars or iDPMS will be blanked of any ancillary data or embedded audio.
Embedded audio	
EDH	Blanked
Input Impedance	75 ohm
Max cable length	HD Video 100 meters using Belden 1694A type cable
	SD Video 300 meters using Belden 1694A type cable

Table 17. Serial Digital Video Outputs

Format	ITU-R656, SMPTE 259M, 270Mbit/s. SMPTE 292M, 1.5Gbit/s
Number of Outputs	Kayak HD 100C, 150C: 12 min., Up to 24
	Kayak HD 200C, 250C: 24
	Kayak HD 200, 250: 24 min., Up to 48
	Kayak HD 300: 36 min., Up to 48
Return loss	> 15 db, 5 MHz to 1.5 GHz
Type of Connector	75 ohm BNC (SMPTE 259M)
Interface	HD Video Formats SMPTE 292M-1998
	SD Video Formats SMPTE 259M-1997
Nominal Amplitude	800 mv peak-to-peak across 75 ohm
Rise & Fall Times	400 to 1400picoseconds 75 ohm termination between 20% and 80% amplitude
Jitter	ITU R 601/656
Output Impedance	75 ohm
DC Offset	< 50mV with 75 ohm termination

Table 18. Analog Reference Input

Video Standard	For HD Video: Tri-level Sync, Analog equivalent to the standard being used
	For SD Video: Color Black, Analog equivalent to the standard being used
Return loss	> 40dB, up to 5 MHz
Connectors	2 each BNC loop through for both HD and SD inputs
Impedance	75 ohm external

Table 19. Kayak HD Video Standards

HD Mode		SD Mode	
1080i 29.97/30	SMPTE 274M Table 1-4, 5	525i 59.94	SMPTE 259M
1080i 25	SMPTE 274M Table 1-6	625i 50	SMPTE 259M
1080sF 24/23.976	SMPTE 211 Table 1-15, 16		
720p 60/59.94/50	SMPTE 296 Table 1-1, 2		

Appendix B

Control Interfaces

Supported GVG100 Commands

Name	Command Code	Remark
CROSSPOINT BUS COMMAND	C1-C4 41-44	Crosspoint interpretation: GVG code Interpretation 00H BLK 01H...0x08H INPUT 1...8 09H COLOR BGD 1 All other codes directly address the internal crosspoint numbers of the switcher.
ANALOG CONTROL COMMAND	C5	Only Write supported: [Control# (EX) - ControlName] [00H (01H) - Transition Lever Arm] GVG100 max value of 0xFFF is linear translated to the DD transition maximum of 0x7FFF
PUSHBUTTON COMMAND	C6 (C7)	Only Write C6 -> on C7 -> off Supported are: Program Bus Crosspoint 0-9 / 00H - 09H / C6 AUTO TANS / 0BH / C6 DSK MIX / 0CH / C6 DSK ON / 0DH / C6,C7 WIPE / 0EH / C6 MIX / 0FH / C6 Preset Bus Crosspoint 0-9 / 10H -19H / C6 REVERSE WIPE / 1DH / C6,C7 FADE TO BLACK / 1FH / C6 Key Bus Crosspoint 0-9 / 20H -29H / C6 GVG100 Wipe Pattern / 30H -39H / C6 BKGD / 48H / C6,C7 KEY / 49H / C6,C7 CUT / 4AH / C6 KEY ON / 52H / C6,C7
WIPE PATTERN SELECT COMMAND	C8	Only Write GVG100 related wipe numbers are directed to the corresponding wipe pattern in the DD switcher (00H -> Vertical Wipe, 01H-> Left Corner Wipe,...). All other pattern codes directly address the internal wipe pattern of the switcher.
TRANSITION MODE COMMAND	CA	Only Write

Name	Command Code	Remark
TRANSITION RATE COMMAND	CC/CD/FD	Only Write
LEARN E-MEM REGISTER	DA	
RECALL E-MEM REGISTER	DB	
ALL STOP COMMAND	F2	
TRANSITION PUSHBUTTON SELECT COMMAND	FB	Supported are: Program Bus Crosspoint 0-9 / 00H - 09H AUTO TANS / 0BH DSK MIX / 0CH DSK CUT / 0DH WIPE / 0EH MIX / 0FH Preset Bus Crosspoint 0-9 / 10H -19H REVERSE WIPE / 1DH FADE TO BLACK / 1FH Key Bus Crosspoint 0-9 / 20H -29H GVG100 Wipe Pattern / 30H -39H BKGD / 48H KEY / 49H CUT / 4AH KEY CUT / 52H

Note Every M/E related command affects the DD35/XtenDD/Kayak **PP** M/E stage by default. To affect another M/E use the **Editor M/E Mapping** feature. The GVG **DSK** command is always translated to Key3 in the **PP** “mapped” M/E stage.

Note Standard GVG200 protocol timing is used. Commands are executed in the third field after response. If there are timing problems, fix them by changing the timing parameters of the editor.

Supported GVG200 Commands

Name	Command Code	Remark
TRANSITION MODE COMMAND	CA	Only Write
TRANSITION RATE COMMAND	CC/CD	Only Write
TRANSITION PUSHBUTTON SELECT COMMAND	FB	
CROSSPOINT BUS COMMAND	C1-C4 (C1-CF for AUX) 41-44 (41-4F for AUX)	Crosspoint interpretation: GVG code Interpretation 01H...0x14INPUT 1...20 15HME1 OUT 16HME2 OUT 17HCLEAN FEED 18HMAIN OUT 21HME3 OUT 25H...27HCOLOR BGD 1...3 30H...4BHINPUT 21...48 AUX buses: The number of AUX buses is not limited. If the effect address is 07H (= AUX Crosspoint) the lower nibble of the command code will be interpreted as the AUX bus number. Up to 15 AUX buses can be controlled.
PUSHBUTTON COMMAND	C6 (C7 for REV,KEY CUT keyer 1, KEY CUT keyer 2)	Only MIX,WIPE, REV and KEY CUT are supported. MIX and WIPE will switch the currently selected buttons for next transition to the given state.
WIPE PATTERN SELECT COMMAND	C8	Only Write
ALL STOP COMMAND	F2	
LEARN E-MEM REGISTER	DA	
RECALL E-MEM REGISTER	DB	

Note The GVG **DSK** command is always translated to the Kayak HD **PP** mixer effect.

Note Standard GVG200 protocol timing is used. Commands are executed in the third field after response.

ESAM Protocol

Starting with software version 6.9.2 the Kayak switcher supports the ESAM protocol to connect to an audio mixer, e.g. Yamaha DM-1000.

Supported Commands

ESAM (Editing Suite Audio Mixer) protocol has been defined by Graham-Patten Systems, Inc.

The full ESAM-2 (a.k.a. SERIAL-II) Protocol Specification can be downloaded from http://www.gpsys.com/products/protocols.htm.

The following commands of the ESAM-2 protocol are supported:

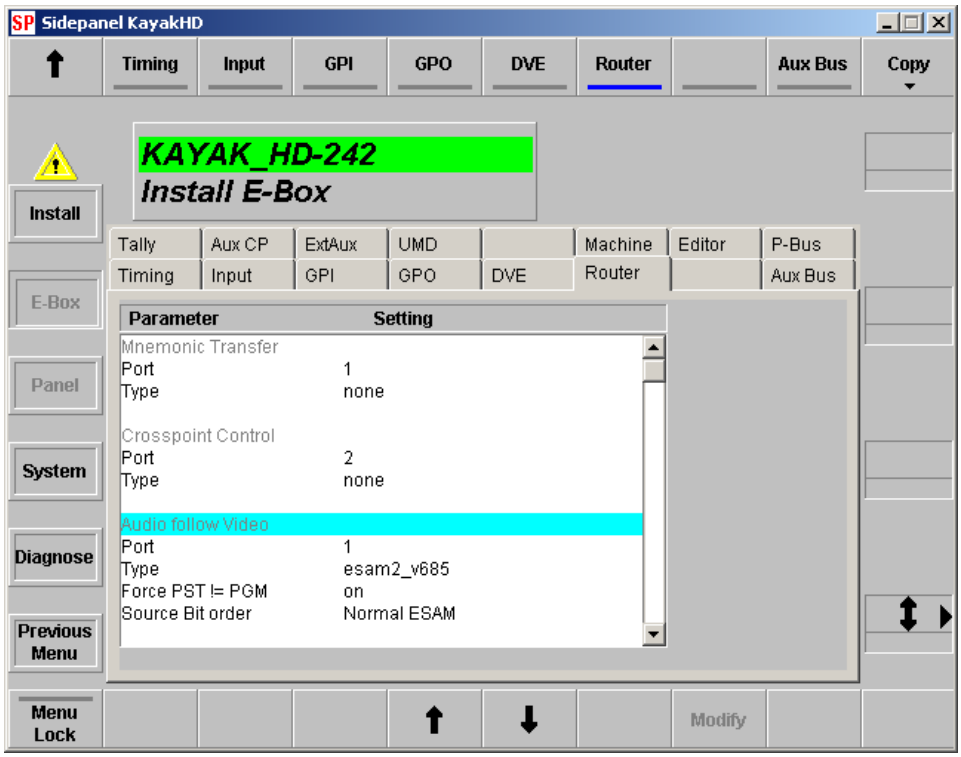
Table 20. Supported Commands

Command Type	Read Command	Write Command
All Stop	-	A0
From Source	-	A1
To Source	-	A3
Transition Start	-	A9
Fader Level	-	AD
Transition Duration	-	AF

ESAM Installation and Configuration

Installation and configuration is accomplished using the Sidepanel menu.

Figure 116. Sidepanel's Install - E-Box - Router Menu



1. Select the port number.
2. Select protocol type: **esam2_V685**
3. Select protocol option for **Force PST=PGM:**
   - Yamaha O3D = **-**
   - Yamaha DM-1000 = **On**
4. Select protocol option for **Source Bit Order:**
   - Yamaha O3D = **Reverse OsD**
   - Yamaha DM-1000 = **Normal ESAM**

Appendix C

Field Replaceable Units and RoHS Compliance

This appendix provides lists of the Field Replaceable Units (FRU) for the Kayak Video Production Center along with their standard and RoHS (Restriction of the use of certain Hazardous Substances) compliant part numbers.

Note The lists given here are for general guidelines only and are subject to change at any time. They do not reflect current pricing or availability information.

The modules and assemblies in the Kayak Video Processor frame and Control Panel surfaces that can be replaced in the field and ordered from Grass Valley Customer Service are listed in Table 21.

Table 21. Kayak HD FRU List and RoHS Compliant Part Numbers

	Non-RoHS	RoHS	RoHS 5 of 6
Hardware			
Kayak HD Large Backplane (8 RU)	6716715XX	7510150XX	6910100XX
Kayak HD Backplane (4 RU)	6716629XX	7710059XX	6910118XX
Kayak HD Frame Power Supply	6200096XX		
Kayak HD Control Proc without RAM Recorder	6716630XX	6910000XX	7710060XX
Kayak HD Control Proc with RAM Recorder	N/A	7710060XX	6910000XX
Kayak HD Mix/Effects	6716631XX	7710061XX	
Kayak HD Transition	6716632XX	7710062XX	
Kayak HD Fan (8 RU)	N/A	7510149XX	
Kayak HD Fan (4 RU)	N/A	7510063XX	
Panels			
Kayak HD 1 M/E Panel	6600049XX		
Kayak HD 2 M/E Panel	6600055XX		
Kayak HD 3 M/E Panel	6600067XX		
Frames			
Kayak HD 4 RU Frame	6600058XX	7610005XX	
Kayak HD 8RU Frame	6600068XX	7610248XX	
Software			
Kayak Software CD (includes documentation)	0638147XX		

Table 21. Kayak HD FRU List and RoHS Compliant Part Numbers

	Non-RoHS	RoHS	RoHS 5 of 6
Miscellaneous			
USB Flash Drive (Supplied)	119820803		
Sandisk 512MB CF Flash Card	163841900		
Battery	146013800		
Manuals			
Kayak Release Notes	0718446XX		
Kayak Release Notes Addendum	0718475XX		
Kayak User Manual	0718447XX		
Kayak Installation & Service Manual	0718448XX		
Kayak HD Installation Planning Guide	0718451XX		
Kayak DD Quick Start Guide (1 M/E)	0718374XX		
Kayak DD Quick Start Guide (2 M/E)	0718375XX		

RoHS (Restriction of Hazardous Substances, European Union Directive 2002/95/EC) Part Number Explanations:

671- Prefix: Non-RoHS compliant.

691- Prefix: Partially RoHS compliant ("RoHS 5 of 6") under an exemption that allows Lead (Pb) in solder. Components are free of the other five substances restricted under EU Directive 2002/95/EC (cadmium, mercury, hexavalent chromium, polybrominated biphenyls, or polybrominated diphenyl ethers). This has become known as "5 of 6 RoHS compliant."

771- Prefix: ROHS compliant.

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