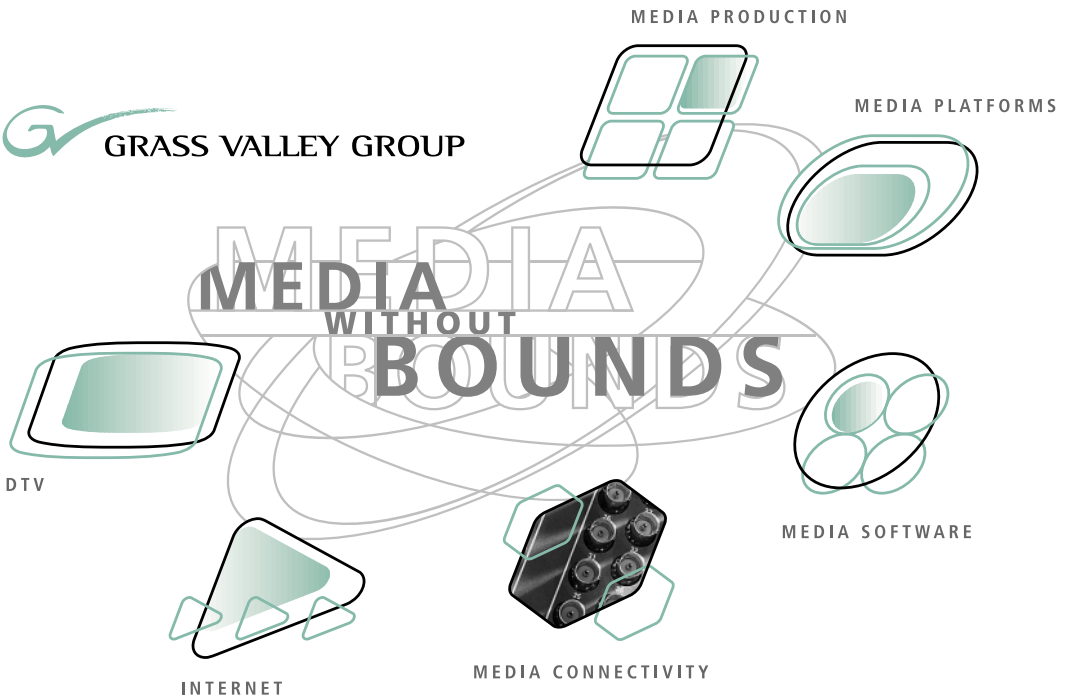
ROUTING AND MASTER CONTROL



The Grass Valley Group creates signal management systems for the world's leading content creators and distributors – open, scalable, and proven systems with the flexibility to help video professionals nimbly repackage their content.

Designed to be as useful tomorrow as they are today, the Grass Valley 7500 Series of routing systems offer virtually infinite scalability – not to mention the most intuitive, most flexible, least power consuming, and most compact design available. Together with the 8900 Series and 2000 Wideband Series of modular products, they offer a step-wise, cost-effective transition from analog to standard-definition (SD) and high-definition (HD) facilities without changing your core signal-management infrastructure.

The Grass Valley 7500 WB wideband router can switch any and all digital formats – from 10 Mb/s to 1.5 Gb/s. And its integration with the Profile digital video platform and Grass Valley switchers and modular lines – including support for Simple Network Management Protocol (SNMP)-based remote diagnostics – leads the industry. The Grass Valley 7500 NB narrowband router is an ideal companion to the 7500 WB system, offering affordable low-bandwidth switching of signals such as MPEG Transport Streams (MTS) and AES/EBU synchronous and asynchronous multi-rate digital audio. And the Grass Valley Series 7000 control system offers extensive built-in redundancy – from power supplies and controllers to interfaces and configurations.

Meanwhile, the reliable and affordable Grass Valley 8900 Series of modular products provide the critical functions necessary to move from analog video to digital video and analog audio to AES/EBU digital audio – as well as providing critical timing and distribution functions. The 2000 Wideband Series offers critical HD and SD distribution and conversion capabilities within a host frame which provides robust power distribution and Ethernet networking. And, the 2000 Wideband Series frame will accommodate any 8900 Series module using a simple adapter card for the ultimate in investment protection and a guaranteed smooth upgrade path.

Both the 8900 Series and 2000 Wideband Series interoperate across an Ethernet TCP/IP network and support a variety of remote-control interfaces – including Web browser, control panel, and SNMP – for control, configuration, monitoring, and diagnostics.

7500 WB WIDEBAND ROUTING MATRIX FRAMES

FEATURES

- Compact space and power saving frames for switching digital video and data signals from 10 Mb/s to 1.5 Gb/s
- Video and data signals includes: SMPTE 259M, 292M, 310M
- Two vertical references which support 24 Hz, 50 Hz, 59.94 Hz, 60 Hz
- Modules include:
  - WB input and output modules, 10 Mb/s to 1.5 Gb/s with selectable reclocking at 143, 177, 270, 360, 540 Mb/s and 1.485 Gb/s
  - SD input and output modules, 40 Mb/s to 360 Mb/s with data reclocking at 143, 177, 270 and 360 Mb/s
  - Universal crosspoint module, 10 Mb/s to 1.5 Gb/s
- Two frame sizes available: 14RU 128x128 and 25RU 256x256
- Module granularity of 32 inputs/32 outputs
- Auto ranging internal AC main power supplies
- 48 VDC operation
- Scalable, step-by-step expansion utilizing variable frame sizes
- Front removable/hot pluggable modules for safe "on-air" maintenance
- "VOM" Video Output Monitor for monitoring virtual mapped SD and/or HD sections (Virtual Matrices)
- Optional redundant internal matrix controllers and power supplies

For your local Grass Valley Group sales and technical support representative see the list in the back of this catalog or inside the U.S. call: 1-800-547-8949.

The 7500 Wideband Routing Switcher is a no-compromise, future proof solution that is ideal for all broadcasters, production facilities, post production facilities, telecommunications facilities, and satellite service providers that need to route any digital signal from 10 Mb/s to signals greater than 1.5 Gb/s. Both HD and SD signals can be routed in the same frame with our Extended Wide Band module set simultaneously – simplifying the transition to high definition formats and preserving your investment.

HD, SD AND DATA – ALL IN THE SAME FRAME

The 7500 WB frames accept different data rate input/output module sets using the same universal crosspoint module. For facilities that require a mix of both SD and HD signals, this provides a cost-effective migration path and eliminates re-cabling and system down-time. Using a combination of Wideband and Standard Definition input/output module sets eliminates the need for a dedicated high definition router and provides cost-effective Serial Digital routing.

The WB input/output module set offers:

- Input cable EQ all the way up to 1.5 Gb/s
- Data reclocking @ 143/177/270/360/540 Mb/s and 1.485 Gb/s
- Bypass operation for signals at non-traditional video rates

These modules offer future proof capability, particularly where SD and HD video is required. There is no need to swap out the modules when new standards become prevalent within the facility.



The SD input/output module set offers:

- Input cable EQ up to 360 Mb/s
- Data reclocking @ 143/177/270/360 Mb/s
- Bypass operation for signals at non-traditional video rates

7500 WB WIDEBAND ROUTING MATRIX FRAMES

These modules offer extremely cost effective switching of today's SD video signals, within the WB matrix frame. As the need for HD video switching increases, simply add WB modules or replace existing WB/SD only modules with WB modules.

DESIGNED FOR SIGNAL INTEGRITY

All 7500 WB matrix frames offer unrestricted, guaranteed, non-blocking, deterministic switching through a flat crosspoint matrix. This ensures that all input and output destinations are always available.

System cable length is never a problem since the cable "EQ" Equalization compensates for amplitude losses within the input cables. Automatic amplitude loss compensation exceeds 300 meters of coaxial cable at SD rates and over 150 meters at HD rates. The system offers selectable multi rate data reclocking at 143/177/270/360/540/1.485 for elimination of jitter associated with long cable runs. In addition, there is a standard "Bypass" mode to enable routing of signals occurring at other than traditional video/data rates.

The dual vertical interval reference inputs enable synchronous switches at 24 Hz, 50 Hz, 59.94 Hz and 60 Hz within the matrix frame. These reference signals are either analog color black or tri-level sync. As future standards are defined, HD reference signals can be used simultaneously with SD reference signals within the same frame. Destinations are configured to switch at one of the two reference inputs, allowing PAL, NTSC and HD synchronous switching within the frame.

The "VOM" Video output module provides four independent destination monitors, enabling destination monitoring of SD/HD virtual matrices within the frame. In addition to traditional destination monitoring it offers source monitoring and an industry unique diagnostic functionality that includes "CRC" Cyclic Redundancy Checking.

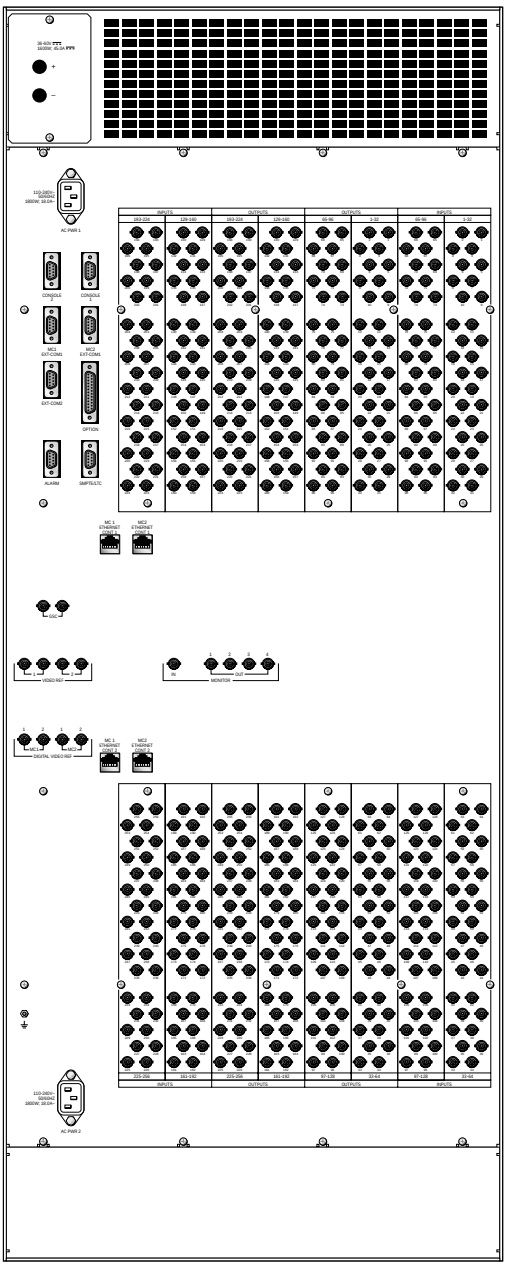
ROBUST AC/DC POWER SUPPLIES

All 7500 WB series matrix frames include internal auto ranging AC main power supplies with the option of a fully redundant load sharing supply. A standard 48 VDC battery "float" connection is supplied on each frame. This connection simplifies power requirements for facilities standardizing on 48 VDC power and provides a simple low cost battery backed up UPS system for facilities standardizing on AC power.

The 7500 WB 128x128 Series matrix frame requires forced air cooling either within the equipment rack or by optional forced air fan assemblies, SMS-FAN assemblies. The 7500 WB 256x256 Series matrix frame contains internal forced air cooling, with thermal control circuitry to vary the cooling efficiency of the fan. Like all system modules the fan and filter assemblies are easily serviced from the front of the equipment rack.

FRONT REMOVABLE/HOT PLUGGABLE MODULES

All Series 7000/7500 matrix frames offer front removable/hot pluggable modules with rear mounted motherboard construction. This design improves the integrity of the system by reducing internal cabling and by eliminating mid plane motherboards with rear mounted active components. This greatly reduces system down time, simplifies cable connections to the frames (no need to route cables to enable access to rear mounted components), increases ease of serviceability, simplifies system expansion, and increases the reliability of the system.



7500 WB 256x256 Rear Connectors.

ORDERING INFORMATION

For specifications and ordering information, see order guide 2WW-7401-5.

7500 NB NARROW BAND MATRIX FRAMES

FEATURES

- Compact space and power saving frames for switching digital signals up to 50 Mb/s
- Multiple reference inputs include: video analog color black and 48 kHz audio
- Modules include:
  - Synchronous AES/EBU 48 kHz digital audio input and output modules
  - Asynchronous data input and output modules for AES/EBU digital audio/MPEG video
  - Universal crosspoint module
  - Dual "AOM" Audio Output Monitors standard w/ synchronous output modules
- Module granularity of 64 inputs/64 outputs
- Auto ranging internal AC mains power supplies
- 48 VDC operation
- Two frame styles available:
  - 75 Ω unbalanced BNC
  - 110 Ω balanced high-density 50-pin D
- Scalable, step-by-step expansion utilizing variable frame sizes
  - 12RU 256x256
  - 24RU 512x512
  - 36RU 768x512
  - 48RU 1024x512
- Front removable/hot pluggable modules for safe "on-air" maintenance
- Each matrix frame comes standard with a controller module and power supply
- Optional fully redundant internal controllers and power supplies

For your local Grass Valley Group sales and technical support representative see the list in the back of this catalog or inside the U.S. call: 1-800-547-8949.

The 7500 NB series matrix frames are the perfect low-power/low-cost solution for routing low-bandwidth signals through your facility. Designed for synchronous or asynchronous digital audio routing, the 7500 NB works as a companion to all other 7000/7500 Series matrix frames. The 7500 NB can also route serial digital data up to 50 Mb/s, making it ideal for LTC linear time code, SMPTE 310 (ATSC 19 Mb data stream), MPEG, and other data routing. This series also works well in telecommunication and cable headend facilities that standardize on 48 VDC battery power.



BNC OR D CONNECTOR FRAMES FOR EASY INTEGRATION

The 7500 NB series matrix frames are available with unbalanced BNC connectors for quick and easy 75 Ω coaxial cable connections or the traditional 110 Ω balanced outputs from high-density 50-pin D connectors, which enable simplified cabling to patch panels.

PROFESSIONAL MULTICHANNEL DIGITAL AUDIO ROUTING

These matrix frames are ideal for broadcasters and audio postproduction facilities that need to route multiple audio signals. They allow for routing of: Synchronous 48 kHz AES/EBU digital audio, Dolby Digital, Dolby E, Surround Sound, 5.1, AC3, and asynchronous data rate audio signals. This is extremely useful in postproduction facilities for music videos, broadcast facilities that are implementing audio processing for DTV/ATSC data streams and high audio usage applications.

As an audio router, this frame uses both video and audio reference "switch point" signals. Video reference is analog color black either NTSC or PAL. The audio reference is a 48 kHz word clock or 48 kHz AES/EBU audio signal. 625 line systems synchronously switch audio at the video vertical reference, 525 line applications switch the audio (depending on field alignment) up to a few micro seconds after the vertical reference.

7500 NB NARROW BAND MATRIX FRAMES

SYNCHRONOUS MODULES FOR LIVE DIGITAL AUDIO PRODUCTIONS

In live productions, where audio timing is critical, synchronous modules eliminate the pops, and other artifacts that result from AES mid-frame switching. The synchronous input audio module frame aligns the AES/EBU data stream and strips off the block data (to be re-inserted later by the output module). The crosspoint module switches at the AES frame boundary to make a seamless, synchronous switch to another AES data stream. The output module rebuilds the AES data stream and outputs the AES signal, complete with necessary block data. additionally the synchronous output module offers enhanced audio processing including a soft switch capability (dunking) that aligns the audio levels at the switch point, and output processing of the AES stream including: summing, swapping and inversion. Each synchronous audio output module provides two audio output monitors. These monitors allow destination monitoring without disturbing the current source/destination selection. With the maximum of four output modules per frame eight independent audio outputs can be monitored simultaneously.

DATA MODULES FOR POST-PRODUCTION DIGITAL AUDIO OR DATA SWITCHING

For routing of data or digital audio in a post-production environment, the asynchronous data input and output modules offer a cost effective routing solution. They can route any serial digital data signal up to 50 Mb/s, making them ideal for LTC linear time code, MPEG data streams including SMPTE 310 (ATSC 19 Mb data stream), muti-rate digital audio streams at 31, 44 and 96 kHz and other data routing.

ROBUST AC/DC POWER SUPPLIES

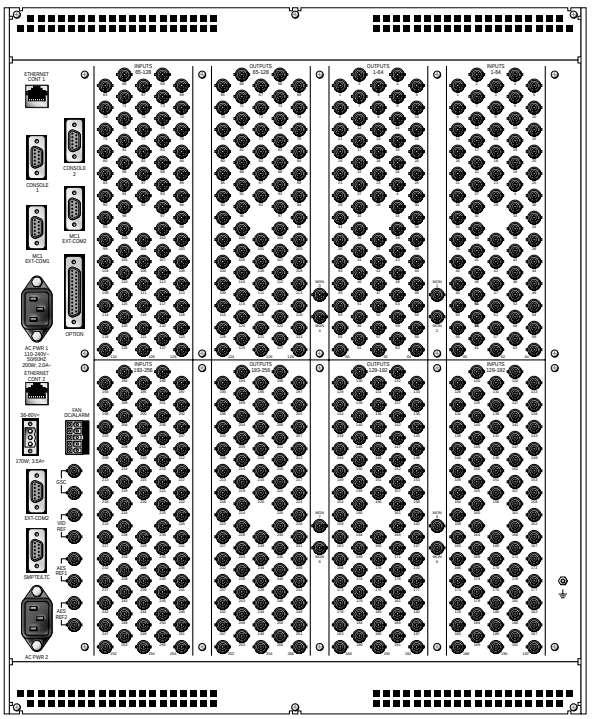
All 7500 NB series matrix frames include an internal auto ranging industry standard AC main power supply with the option of a fully redundant load sharing supply. A standard 48 VDC battery “float” connection is supplied on each frame. This connection simplifies power requirements for facilities standardizing on 48 VDC power and provides a simple low cost battery backed up UPS system for facilities standardizing on AC power. Maximum power requirement for a fully populated 256x256 frame is only 120 watts.

FRONT REMOVABLE/ HOT PLUGGABLE MODULES

All Series 7000/7500 matrix frames offer front removable/hot pluggable modules with rear mounted motherboard construction. This design improves the integrity of the system by reducing internal cabling and by eliminating mid plane motherboards with rear mounted active components. This greatly reduces system down time, simplifies cable connections to the frames (no need to route cables to enable access to rear mounted components), increases ease of serviceability, simplifies system expansion, and increases the reliability of the system.

SIMPLE FRAME EXPANSION

System expansion is easily accomplished in the field simply by mounting another 7500 NB matrix frame directly below the current frame, and plugging in the expansion module set. If there is no space directly below the current frame, a 4.5 meter expansion cable set is available.



7500 NB Rear Connectors (BNC version shown).

ORDERING INFORMATION

For specifications and ordering information, see order guide 2WW-7401-5.

SERIES 7000 DV SERIAL DIGITAL VIDEO MATRIX FRAMES

FEATURES

- Compact space & power saving frames for switching digital video/data signals to 360 Mb/s
- Selectable data reclocking @ 143/177/270/360 Mb/s, plus "bypass" non reclocking operation
- Input "EQ" cable equalization of at least 300 meters
- Two vertical "switch point" references which support 50 Hz, 59.94 Hz, 60 Hz
- Scalable, step-by-step expansion up to 1024x1024 utilizing variable frame size:
  - 6RU 64x64
  - 12RU 128x128
  - 18RU 256x128
- Granularity of 32 inputs/32 outputs
- Dual outputs per destination
- Front removable/hot pluggable modules for safe "on-air" maintenance
- VOM (Video Output Monitoring) standard with all DV Series frames
- Each matrix frame comes standard with a controller module and power supply
- Optional fully redundant controllers and power supplies

For your local Grass Valley Group sales and technical support representative see the list in the back of this catalog or inside the U.S. call: 1-800-547-8949.

The DV Series matrix frames are ideal for facilities that have invested in a serial digital video/data infrastructure, with no plans for full bandwidth high definition routing. These matrix frames enable switching of digital signals up to and including 360 Mb/s.

Input, crosspoint, output and control interface modules are housed within the frame, along with a video output monitor (VOM) that allows destination monitoring without disruption of service. External 3RU fully redundant power supplies are used to power the frames. With independent, dual-looping vertical reference inputs (analog color black), destinations can be configured to switch at two different rates – allowing PAL and NTSC rates within the same frame. Dual outputs per destination reduce requirements for external fan out distribution amplifiers.



Series 7000 DV 256x128 Matrix Frame.

ORDERING INFORMATION

For specifications and ordering information, see order guide 2WW-7401-5.

SERIES 7000 CLASSIC ROUTING MATRIX FRAMES

FEATURES

- Audio, video and data matrices for most analog and digital formats
- Simultaneous analog and digital video within a single matrix
- Dual outputs per destination
- Front removable/hot pluggable modules for safe "on-air" maintenance
- Frames come equipped with a node controller module and power supply
- Fully redundant controllers and power supplies available

Video Frames

- Two video frames: 64x64 and 128x128
- Video module granularity of 16 inputs/16 outputs
- "VOM" Video Output Monitoring
- Analog video modules offer
  - 30 MHz ±0.1 dB bandwidth
  - DC Coupled or Clamped signal processing
  - Input cable "EQ" Equalization to 300 meters
- Digital video modules offer
- Operation up to and including 360 Mb/s
- Selectable reclocking @ 143/177/270/360 Mb/s
- "Bypass" non-reclocked mode
- Automatic input cable "EQ" Equalization

Audio Frames

- Two audio frames: Dual 64x64 and 128x128
- Simultaneous analog and/or digital audio within a single matrix
- Audio module granularity of 32 input/output blocks
- "AOM" Audio Output Monitoring
- Analog audio modules offer
  - 200 kHz bandwidth
  - +24 dB headroom
  - "LTC" Linear Time Code operation
- Digital audio modules offer
  - Multi format/rate operation
  - Asynchronous switching

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The Classic Series matrix frames are ideal for facilities that have heavily invested in composite and or component analog video equipment, which are starting to make the transition to digital. These matrix frames are unique in that they allow both analog and digital signals to operate within the matrix frame at the same time. As digital requirements increase, simply insert digital modules and configure A-to-D or D-to-A conversion tie lines to and from the analog sources. Dual outputs per destination reduce



Series 7000 Classic 64x64 Matrix Frame.

requirements for external fan out distribution amplifiers, and allow for patch panel connections direct from a destination. The VOM and AOM functions offer the capability to monitor any video or audio signal without disrupting service to its destination.

VIDEO MATRIX FRAMES

Input, crosspoint, output and control interface modules are housed within the frame, along with a video output monitor (VOM) that allows destination monitoring without disruption of service. The 64x64 video frame can accept an internal "MCPU" Master Central Processing Unit system controller module, reducing the need for an external control system.

The analog modules offer multi-format routing of component (RGB and YUV) and composite signals (NTSC and PAL). Configurable on an input by input basis, is either a DC coupled mode for bipolar color difference signals, or DC Clamped mode for composite NTSC or PAL operation.

The digital modules offer selectable multi-rate data reclocking at 143/270/360 Mb/s for elimination of jitter associated with long cable runs.

AUDIO MATRIX FRAMES

The audio matrix frames house 32x32 block signal modules with on card "AOM" Audio Output Monitoring, and control interface modules. Audio frames are available in both analog and digital versions.

ORDERING INFORMATION

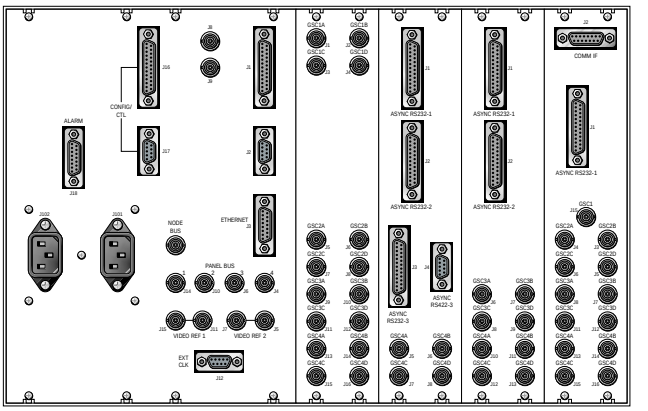
For specifications and ordering information, see order guide 2WW-7401-5.

SERIES 7000/7500 CONTROL SYSTEM

FEATURES

- Robust and flexible enough to support 1024 sources, 1024 destinations and 32 control levels
- Fast "Booting" real-time OS running on a dedicated "MCPU" Master Central Processing Unit
- RISC (reduced instruction set) processing and distributed processor architecture for increased speed and redundancy
- Front removable/hot pluggable modules for safe "on-air" maintenance
- Extensive system module redundancy options include
  - MCPU
  - Communication Interface
  - Power supply
- "GUI" Graphical User Interface running on standard Windows® 95/98/NT via Ethernet TCP/IP
- Multi-session "VSD" Visual Status Display running on standard Windows 95/98/NT via Ethernet TCP/IP
- Named-based configuration of control panels, sources, destinations and matrix frames
- Robust system configuration capabilities eliminate down-time while making on-line changes and provide:
  - Extensive on-line control
  - Complete off-line configuration capabilities
  - Tie-line management
  - Virtual matrix mapping
- Open, published control interfaces supported by many third-party control systems
  - Automation, Tally, UMD
  - Ethernet 10Base-T and 10Base-2
  - RS422 and RS232
- 6RU Frames with extensive I/O capabilities
  - Four coaxial control panel busses support up to a total of 64 control panels
  - Dual video references
  - Synchronization clock input
  - Ethernet interface, transceiver cable MAU
  - Node bus matrix control
  - Dedicated Alarm port
  - Diagnostic port
  - Extensive application specific control panels available

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Series 7000/7500 Master Control Connections (shown with a variety of communications interface modules).

The Series 7000/7500 control system provides frame-accurate switching with up to 32 levels of control, ensuring responsive and predictable performance. This system has been field-proven in some of the most demanding facilities in the world, with installed systems up to 1024x1024. Extensive redundancy options minimize down-time for mission critical applications.

POWERFUL TIE-LINE MANAGEMENT

Tie Line Management allows for transparent routing of signals between matrices. Tie-lines make all of the sources on a remote routing matrix available to users on a local matrix through dedicated interconnections. When a user requests a source that is not found on the local matrix, the request is automatically assigned to a tie-line and acquired from the remote matrix. Selectable tie-line sharing allows multiple users to share the same tie-line when requesting the same source on the remote matrix, minimizing the number of dedicated interconnections. Placing conversion equipment on tie-lines between dissimilar matrices, eliminates the need for a dedicated converter for each source.

VIRTUAL MATRIX MAPPING

Virtual matrix mapping maximizes crosspoint utilization by subdividing a physical crosspoint matrix into multiple virtual matrices – eliminating the need for dedicated crosspoint modules for different types of signals. In addition, crosspoints can be selectively assigned to ensure that input signals are only routed to appropriate output destinations. These virtual matrices can be tied to a single control level for simultaneous switching (such as audio/video, video/key or R/G/B). Virtual matrix mapping also makes possible logical groupings of device connections, simplifying system cabling. System re-cabling is minimized when equipment is upgraded since changing the type or format of equipment on an input or output requires only a modification of the virtual matrix table to assign signals to the correct matrix.

SERIES 7000/7500 CONTROL PANELS

FEATURES

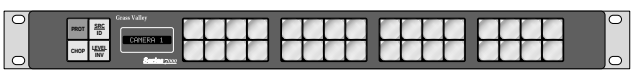
- Programmable, eight character names for sources, destinations, salvos, levels and panels
- Relegendable buttons
- Chop Function for automatically switching between sources for quality comparisons
- Protect Function to protect destinations from intervention by other users
- Simple 75 Ω coaxial "T" connection for up to 16 panels per bus

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Series 7000/7500 control panels are completely programmable using our PC GUI interface and can be configured to meet almost any requirement (even allowing buttons to be completely disabled). Panels store their personality programs internally in non-volatile memory, allowing them to reboot extremely quickly after a power outage or to be relocated without reconfiguring. Panels connect in series with a BNC-T connector which allows panels to be removed and relocated without affecting other panels downstream.

Most panels feature PROT and CHOP functions. Protect (PROT) prevents other devices from changing the selected source to destination connection. CHOP allows two sources to be rapidly switched on one destination which is useful for signal timing, camera matching, etc.

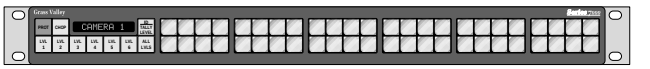
The panels feature, easy to use, high quality buttons with positive feedback to indicate the switch has been pressed. Removable lens chips allow button source/destination names to be changed as required. Displays are bright and easy to read in a variety of light levels and viewing angles.



SMS-P32 Control Panel.

32 BUTTON-PER-SOURCE CONTROL PANEL

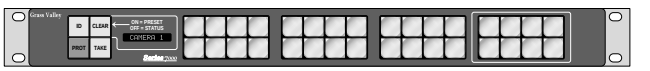
- Selects 1 of 32 sources to a single destination
- User-programmed pushbuttons so any button can select any source in the system
- Buttons can be programmed to select levels for use in video and audio breakaway operations
- Excellent for use at tape/disk machines for fast immediate access to source selection



SMS-P48 Control Panel.

48 BUTTON-PER-SOURCE CONTROL PANEL

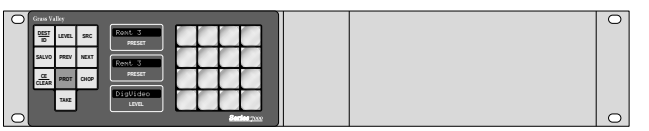
- Selects any of 48 sources to a single destination
- Allows instant access to any of six independent levels or all levels at once
- User-programmed pushbuttons allow any button to select any source in the system
- Ideal for mobile installations



SMS-SCP Control Panel.

SIMPLE CONTROL PANEL

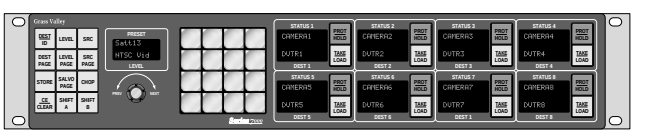
- Eight user defined function keys support any combination of source, destination, Salvo, and/or level operations
- 24 button alphanumeric keypad provides access to many source and destination names
- Excellent for use where customized operation is required to provide basic source selection combined with custom features such as a choice of destinations, simple level selection or occasional Salvo usage



SMS-UCP-XY Control Panel (shown with mounting kit).

UNIVERSAL XY CONTROL PANEL

- Can be programmed to control a single destination or any combination of destinations
- User-programmable keypad allows you to preset sources for subsequent takes
- Separate displays for preset, status and level

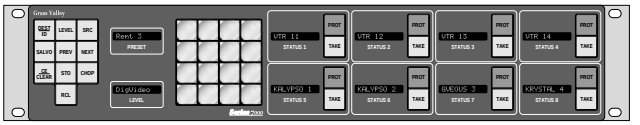


SMS-EDP Control Panel.

EIGHT DESTINATION PAGING CONTROL PANEL

- Ultimate in power and versatility
- Personalized, user-defined configurations
- Simultaneous control and display of any 8 sources and destinations
- 2 shift buttons provide expanded access to 48 prefixes, 48 suffixes and 48 pages
- Scroll through pages of sources, destinations, Salvos, and levels
- Password protection

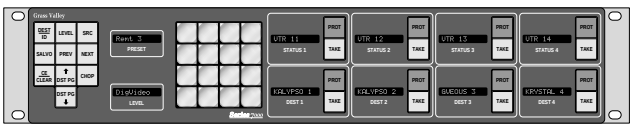
SERIES 7000/7500 CONTROL PANELS



SMS-MB8 Control Panel.

MULTIBUS 8 CONTROL PANEL

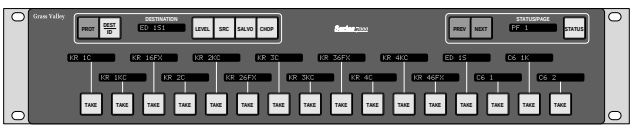
- Eight separate destinations can be controlled and displayed; each with independent take and protect buttons and dedicated status windows
- Panel can be programmed to control only 8 specific destinations or programmed to allow you to change destinations as required



SMS-MB4 Control Panel.

MULTIBUS 4 CONTROL PANEL

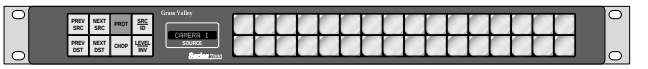
- Simultaneous control and display of any 4 sources and destinations
- Allows assigned destinations to be changed quickly to match changing production needs



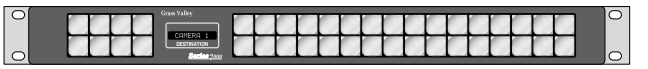
SMS-SDP Control Panel.

SINGLE DESTINATION PAGING CONTROL PANEL

- 16 separate full 8 character displays give instant visual indication
- Ability to scroll through pages of sources, Salvos and levels



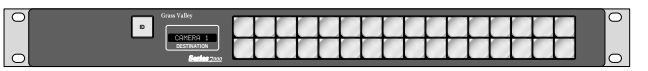
SMS-PXS Source Control Panel.



SMS-PXD Destination Control Panel.

PROGRAMMABLE XY CONTROL PANEL

- Control panel with 32 pushbuttons programmable to select a source, a destination, or a Salvo
- Buttons can be programmed to select levels when in the LEVEL mode. This sets up the level(s) to be switched during subsequent TAKE(s)
- Excellent for use with one or more tape machines; especially good for dubbing as multiple destinations (machines) can be grouped together so that the selected source is switched to the grouped destinations with one button press



SMS-PXYE Control Panel.

EXPANSION PANEL FOR PROGRAMMABLE XY CONTROL PANELS

- Expansion control panel with 32 pushbuttons used to add more selections to SMS-PXY
- Each button can be programmed to select a source, a destination, or a Salvo

ORDERING INFORMATION

SMS-P32
32 button per source control panel.

SMS-P48
48 button per source control panel.

SMS-SCP
Simple control panel.

SMS-UCP-XY
Universal XY control panel.

SMS-RMK
Rackmount kit for SMS-UCP-XY.

SMS-EDP
Eight destination paging control panel.

SMS-MB8
Multibus 8 control panel.

SMS-MB4
Multibus 4 control panel.

SMS-SDP
Single destination paging control panel.

SMS-PXY
Programmable XY source and destination control panel set.

SMS-PXS
Programmable XY source control panel.

SMS-PXD
Programmable XY destination control panel.

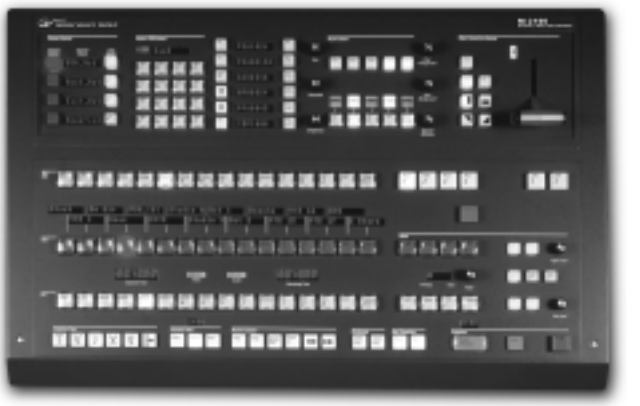
SMS-PXYE
Expansion control panel for SMS-PXS or SMS-PXD.

M-2100 SDTV/HDTV DIGITAL MASTER CONTROL SYSTEM

FEATURES

- Simultaneous control of SDTV and HDTV channels from the same panel
- Supports multiple DTV formats:
  - SDTV 270 Mb/s (50/59.94 Hz)
  - HDTV 1080i, 720p (50/59.94/60 Hz) (59.94/60 Hz)
- Completely configurable system for greater value
- Designed for the future with true multichannel, multipanel functionality
- Integrated SqueezeBack™ effects and Profile® PDR clip stacker
- Unmatched digital audio capabilities
- Extensive, flexible keying functionality
- Routing system interface and control

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M-2100 SDTV/HDTV Digital Master Control Panel.

The Grass Valley M-2100 Digital Master Control System addresses the requirements of today's standard definition component digital facilities as well as emerging high definition broadcast needs. Simple expansion to multichannel, multiformat operation from a single control panel makes the M-2100 system ideally suited for facilities increasing their reach with additional channels and services. In addition to multichannel operation, the system offers extensive keying flexibility, separate and embedded internal digital audio processing, and a wide range of software-enabled options.

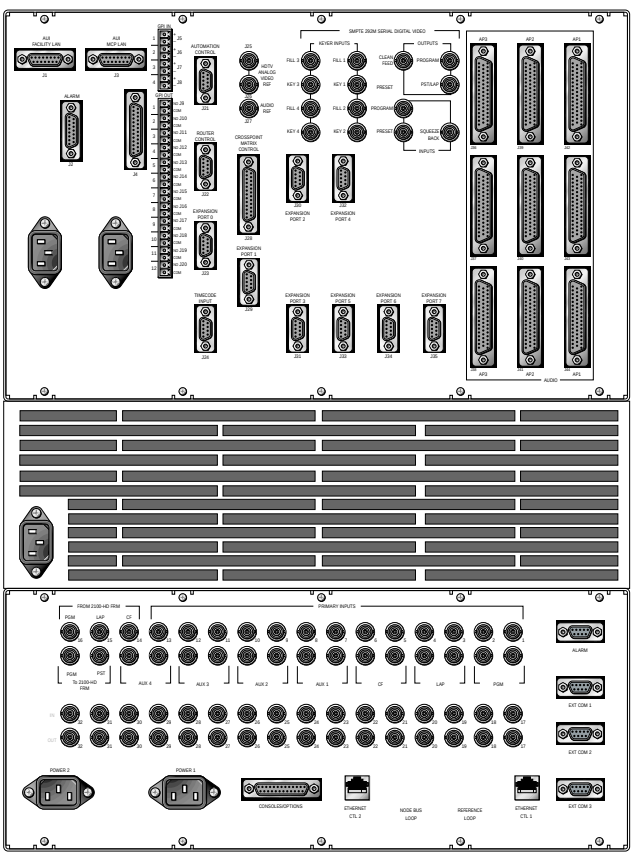
Designed as a true multichannel system, the M-2100 prepares your facility for the future. Your configuration options can be as compact as a single audio/video/control (A/V/C) processing frame or as complex as multiple control panels with multiple SDTV and/or HDTV A/V/C processing frames. Up to 16 on-air channels can be controlled from a single panel. Multiple panels are efficiently connected via the Control Panel LAN. This means greater facility utilization, increased revenue opportunities, and cost and space savings for your broadcast operations.

The M-2100 system employs component serial digital video processing to provide superior picture quality. The highest possible audio quality is achieved using 48 kHz AES/EBU digital audio processing. The SDTV system incorporates 270 Mb/s data rates to provide compatibility with 4:3 or 16:9 picture aspect ratios. The HDTV system incorporates 1.485 Gb/s rates supporting both 720p and 1080i.

Compatible with Windows® 95/98 and NT operating systems, the M-2100 is easily configured via a PC-based Graphical User Interface. For multiple frame operations, a single PC with LAN connection can be used to communicate with all frames.

USER-DEFINED CONFIGURATION

An economical building block approach lets you configure your M-2100 system with the exact features you want. Later, you can easily upgrade and expand your system as your needs and budget require.



HDTV A/V/C Processor Frame Rear Connectors.

M-2100 SDTV/HDTV DIGITAL MASTER CONTROL SYSTEM

SqueezeBack™ effects available on SDTV and HDTV

SqueezeBack effects provide an exclusive integrated DVE squeeze and tease effect, with foreground crops, positioning and compressing pictures. This allows you to move a picture to a preset location at a user-selectable rate. SqueezeBack effects also opens an external background input for promotion of your next event during program credits. This function includes protected setups and operator recalls of four preset positions. By integrating an effects system directly into the M-2100, the need for a separate, costly DVE is reduced.

Profile® clip stacker

Another unique feature of the M-2100 system is the Profile PDR Clip Stacker. Integrated clip stacking offers single point control for viewing, stacking, and playing-to-air of clips stored on a Profile PDR. With integration via an Ethernet LAN, this feature provides linked inputs, clip name transition logging, and clip name and duration displays. Profile PDR control is integrated into the main master control panel for ease of operation.

Grass Valley controls

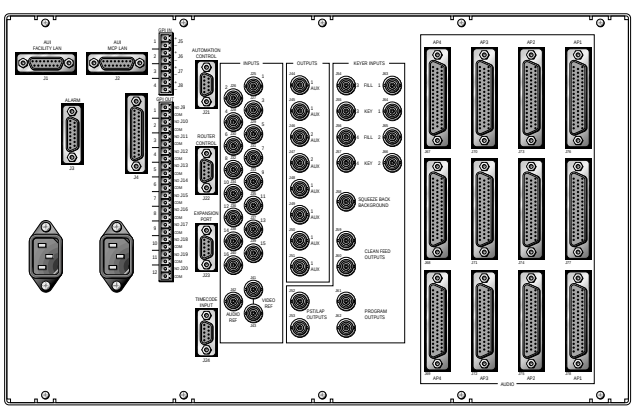
Familiar Grass Valley button-per-function controls are another M-2100 system exclusive. Color differentiated function areas, large LED displays, and the traditional grouped function layout make M-2100 operation a snap. Operators who are familiar with the industry-standard Grass Valley Analog Master 21 system will quickly pick up the new features and functions.

Digital audio capabilities

One digital audio module, providing a single AES/EBU 48 kHz digital audio stream, is standard on both the SDTV and HDTV processing frames. This enables Lt, Rt (Left total, Right total) surround sound capability.

SDTV processing is scalable from one to four digital audio streams. The SDTV system allows embedded audio processing per crosspoint. This exclusive feature provides enhanced system flexibility and lower system cost.

The HDTV processing frame allows up to two additional audio processing modules, supporting six channels, for the best quality AC-3 audio. The HDTV system allows embedded audio processing on a global basis.



SDTV A/V/C Processor Frame Rear Connectors.

Hot pluggable, front removable SDTV and HDTV modules

We understand your need for uninterrupted reliability, so we have included another Grass Valley exclusive: hot pluggable, front removable modules and standard dual power supplies.

Extensive keying capabilities

Extensive, flexible keying capabilities are scalable to meet your system's needs.

Configure your SDTV system by choosing optional keyer boards. Each board contains dual luminance linear keyers with Borderline® and drop shadow functionality. Two of the optional keyer boards can be added to your SDTV system, providing four luminance linear keyers. The optional chroma keyer will allow the dual keyer module to become a single luminance linear keyer with chroma keyer.

Configure your HDTV system with dual luminance linear keyer functionality: up to four luminance linear keyers or frame store keyers with single luminance linear keyer in place of one or both of the dual keyer modules.

Software-enabled options

A number of optional capabilities can be accessed from the convenience of your own facility. Software options (such as wipe transitions, key borders, SqueezeBack effects, embedded audio processing, transition logging, split audio-video transitions and serial tally) can be unlocked for immediate demonstration or permanently enabled when purchased.

Integration with Grass Valley Series 7000/7500 routing systems

Any combination of router source selections can be easily accomplished from the 2100-RPS control panel option. For proper transition logging, source names are carried from the Series 7000/7500 assignments to the master control panel displays above the program bus. Unique attribute programming allows groups of devices with identical control parameters (including parallel or serial machine control, serial protocols, embedded audio and preroll times) to have parameters defined and adjusted for the prefix group.

M-2100 SDTV/HDTV DIGITAL MASTER CONTROL SYSTEM

M-2100 OPTIONS

The M-2100 includes Integrated Machine Control functionality for easier operation. The M-2100 Device Control Engine enables RS-422 serial machine control of up to 30 dedicated or router linked Sony® or Ampex® protocol VTRs.

Clock Displays of segment and remaining time are displayed on the control panel and can be remotely displayed via a clock driver connection on the back of the panel. Remote Clock Display provides greater flexibility and convenience by allowing viewing from locations around the control room.

The control panel also displays Transition Rate and Transition Delay information in either seconds or frames. Eight character LEDs above the program bus crosspoints indicate configured crosspoint name, dedicated matte source, Profile clip name, or router source names–depending on your system configuration.

Input non-sync detection and indication of all video/audio sources (including program/preset background inputs, key cut, key fill, and all audio input channels) alerts operators of potential problems for quick remedy.

The manual lever arm assembly enables manual transition control of any audio or video transition, including background program/preset wipes and audio mixes. Transitions include: Take, Fade/Fade, Take/Fade Mix (cross-fade/dissolve), and Fade/Take. Additional customer defined transitions can be configured as required, to enable audio lead/lag functionality. Four wipe patterns are optionally included with edge softness and pattern reverse modifiers.

As-Aired transition logging, configuration setups, error reporting and diagnostics, chroma keyer setup, TIFF file transfers, and software upload are all accessible or configurable from an external PC compatible computer running Windows 95/98 or NT operating systems.

Open automation protocol enables complete control of the processing frame with or without the control panel.

SPECIFICATIONS

INPUTS – SDTV SYSTEM
Video System: All inputs:
270 Mb/s serial digital, 75 Ω BNC
16 primary: Pgm, Pst, Aux
4 key source
4 key fill
1 SqueezeBack™ background

Audio System: All inputs: 48 kHz AES3
16 Primary: Pgm, Pst, Aux
4 only

External Reference:
1 looping video reference: NTSC/PAL color black
1 terminating audio reference: 48 kHz clock/signal
1 timecode input: longitudinal TC (LTC)

INPUTS – HDTV SYSTEM
Serial Digital Video:
Type of connectors: 75 Ω BNC, (SMPTE 292M)
Cable equalization: automatic for up to 100 meters of Belden 1694A @ 1.5 Gb/s
Return loss (1 MHz to 1500 MHz): 15 dB minimum

External Reference:
Tri Level Sync
(SMPTE 240M) 50, 59.94 and 60 Hz
Connector: 75 Ω BNC, looping
Nominal amplitude: ±300 mV pp
Line rate: 1080i: 33.7 kHz, 720p: 45 kHz
1 terminating audio reference: 48 kHz clock/signal

SPECIFICATIONS CONTINUED

OUTPUTS – SDTV/HDTV SYSTEMS
Video System:
All outputs 75 Ω BNC
2 program
2 look ahead preview
2 clean feed
4 aux buses with dual outputs

Audio System (per module):
All outputs: 48 kHz AES3
2 program
2 preset
2 clean feed
4 aux buses with dual outputs
Monitoring outputs: 1 monitor #1, 1 monitor #2
Meter drives: 1 program, 1 preset, 1 off-air

HDTV VIDEO STANDARDS
1080i: 50, 59.94 and 60 Hz (SMPTE 274M)
720p: 59.9/60 Hz (SMPTE 296M) (switch selectable)

INTERFACES
Processing Frame:
GPI: Fully configurable 4 inputs/ 12 outputs, each with individual removable "phoenix" connectors
Alarms: 4 dry contact programmable
Router control: 10-BaseT Ethernet
Automation control: RS-422 9-pin female "D" connector
Tally expansion port: RS-422 9-pin female "D" connector

Manual Control Panel:
Alarms: 2 dry contacts

Timecode Outputs:
2 XLR connectors
Segment and remaining

PHYSICAL DIMENSIONS
Manual Control Panel (SDTV/HDTV):

Height	15.5 cm	6.12 in.
Width	68.5 cm	27.0 in.
Depth	43.8 cm	17.25 in.
Weight	21.8 kg	48 lb.

SDTV Processing Frame:

Height (6 RU)	26.0 cm	10.25 in.
Width	48.26 cm	19.0 in.
Depth	47.0 cm	18.5 in.
Weight	25.45 kg	56 lb.

HDTV Processing Frame:

Height (6 RU)	26.67 cm	10.5 in.
Width	48.26 cm	19.0 in.
Depth	47.0 cm	18.5 in.
Weight	26.31 kg	58 lb.

HDTV Crosspoint Matrix:

Height (4 RU)	18.0 cm	7.0 in.
Width	43.0 cm	17.0 in.
Depth	49.0 cm	19.25 in.
Weight	17.69 kg	39 lb.

POWER CONSUMPTION
SDTV Frame:
400 W (maximum)
200 W (typical)

HDTV Frame:
400 W (maximum)
300 W (typical)

Control Panel:
200 W (maximum)
100 W (typical)

ENVIRONMENTAL CHARACTERISTICS SDTV AND HDTV SYSTEMS
NOTE: The frame *requires* forced air cooling with SMS7000 fan assemblies

Operational Temperature: 0° to 40°C (32° to 104°F)

Storage Temperature: -25° to 85°C (-13° to 185°F)

Full Specifications Met At: 20° to 30°C (68° to 86°F) After 30 minute warm-up

Relative Humidity: Up to 95% (noncondensing)

ORDERING INFORMATION

ADDITIONAL INFORMATION
For additional information on these products, please request the following literature:

M-2100
Ordering Guide (2WW-9302-3).

M-2100
Installation Planning Guide (2WW-9303).

M-2100 Poster (2WW-9355).

PERFORMER™ ROUTING SWITCHERS

FEATURES

- 10x1 video/dual audio switching with full breakaway operation
- RS-232/422 serial interface, standard
- Optional remote control panel
- HD, SD and Analog versions available
- Available with built-in control panel (SD & HD only)
- Front panel data reclocking switch for standard data rates or bypass (HD only)
- Two streams of AES digital audio (SD & HD only) with either balanced "D" connectors (SD only) or BNCs

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Performer Routing Switchers offer high-performance features in a compact 10x1 design. These compact routers meet the need for low cost utility routing and are ideal for dubbing or monitoring stations, mobile productions or as a bypass switch in master control.

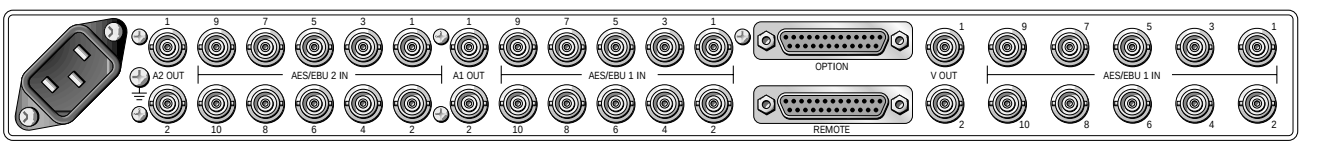
This three-level breakaway router is available in three different formats:

- Performer HD, high-definition serial digital (1.485 Gb/s)
- Performer SD, standard definition serial digital (270 Mb/s)
- Performer Analog, PAL/NTSC

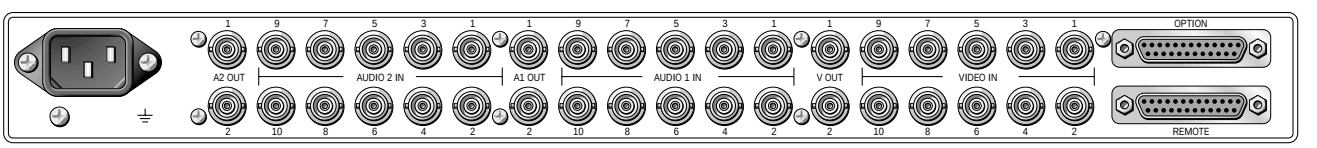


Performer – HD.

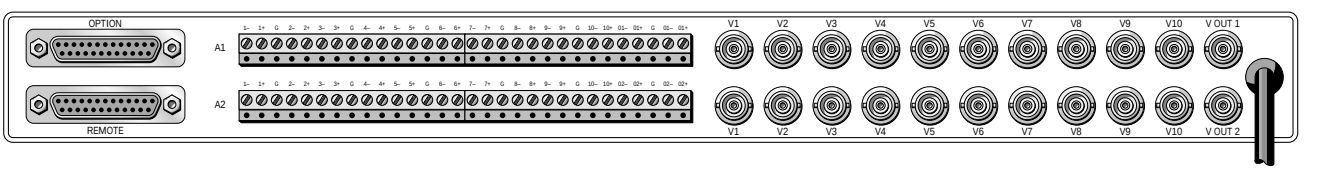
The Performer HD comes standard with local control buttons and an LED status display. A built-in protect feature prevents accidental operation by locking the input select switches and indicating protection on the status display. Standard on all Performer routers, is an RS-232/422 serial interface for reliable operation from a remote Performer control panel with the same features. The Performer SD is available with either unbalanced BNC connectors or balanced "D" connectors for audio, and with either built-in local control or with a plain front for remote control applications. The analog version is only available with a plain front. The same remote control panel can be used with any Performer router.



Performer – HD Rear Connectors.



Performer – SD Rear Connectors (BNC Version).



Performer – Analog Rear Connectors.

PERFORMER™ ROUTING SWITCHERS

SPECIFICATIONS

VIDEO INPUTS
HD Version: 10, 75 Ω 1.485 Gb/s serial digital video, terminating (SMPTE 292M)

SD Version: 10, 75 Ω 270 Mb/s serial digital video, self-terminating (SMPTE 259M)

Analog Version: 10, 75 Ω, looping, return loss >40 dB to 5 MHz (NTSC/PAL)

CABLE EQUALIZATION
HD Version: automatic up to 100 meters (Belden 1694A) at 1.485 Gb/s

SD Version: automatic up to 300 meters (Belden 8281 or equiv.)

AUDIO INPUTS
HD Version: 2 sets (10 each) 75 Ω unbalanced BNCs, AES/EBU (AES3-1992)

SD Version: 2 sets (10 each) 75 Ω unbalanced BNCs (AES3-1992) or 110 Ω balanced D connector (AES3id-1992)

Analog version: 2 sets (10 each) balanced, bridging, >20 kΩ

VIDEO OUTPUTS
HD Version: 1 dual, 75 Ω 1.485 Gb/s serial digital video, terminating (SMPTE 292M)

SD Version: 1 dual, 75 Ω 270 Mb/s serial digital video, self-terminating (SMPTE 259M)

Analog Version: 1 dual, 75 Ω, source terminating (NTSC/PAL)

AUDIO OUTPUTS
HD Version: 2 sets (1 dual loop-through each) 75 Ω unbalanced BNCs, AES/EBU (AES3-1992)

SD Version: 2 sets (1 dual loop-through each) 75 Ω unbalanced BNCs (AES3-1992) or 110 Ω balanced D connector (AES3id-1992)

Analog Version: 2 sets (1 each) balanced, 600 Ω

Control Interface: Serial, RS-232/422, 25-pin D connector

OPERATING MODES
HD Version: 1.485 Gb/s, reclocking or 10 Mb/s to 700 Mb/s, bypass mode

SD Version: reclocking at 143, 177, 270, 360 Mb/s, auto reclocking, or bypass mode

ORDERING INFORMATION

PFR-HD
Performer HD high definition video and AES/EBU audio routing switcher with integral control panel.

PFR-SD
Performer SD Serial Digital Video and AES/EBU routing switcher with D connector audio I/Os and integral control panel.

PFR-SDB
Performer SD Serial Digital Video and AES/EBU routing switcher with BNC audio I/Os and integral control panel.

PFR-SDRC
Performer SD Serial Digital Video and AES/EBU routing switcher with D connector audio I/Os for remote control.

PFR-SDRCB
Performer SD Serial Digital Video and AES/EBU routing switcher with BNC audio I/Os for remote control.

PFR-RC
Performer analog video and dual analog audio routing switcher for remote control.

PSCP
Performer serial control panel.

PTJO
Performer tally, joystick override module.

PRMK
Performer rear support rackmount kit.

PMAN
Product Manual.