

K-Frame Production Switcher Family Catalog



PRODUCTION SWITCHERS

Production switchers from Grass Valley® are engineered for fast, efficient and creative productions. Operations are optimized with easy-to-load show programming, responsive automation and powerful features using macros and timelines. As an integral component of creating live television coverage of sports, entertainment and news from both studio and mobile installations, Kayenne®, Karrera® and GV Korona® panels include familiar controls and intuitive interfaces. These systems define the industry standard operation, so training costs are lower and finding operators is easier.



These production switchers are powered by Grass Valley's K-Frame™ video processing engines — providing the ultimate in production innovation, functionality, power and flexibility. K-Frame production switchers share the same workflow — whether K-Frame XP, the most powerful switcher in a new generation of switchers for live HD, UHD 4K and even 8K production, or the K-Frame V-series, the powerful entry level of the K-Frame processing engines.

K-Frame production switchers integrate with camera controllers, routers, server clip storage, third-party tally control and news automation systems for a seamless production ecosystem.

With four Emmy® Awards for production switcher technologies, Grass Valley is the proven leader when it comes to combining power and creativity to deliver the compelling programming that viewers expect.

4K and IP Scalability

The K-Frame XP provides a no-compromise approach to 4K with full raster processing in 4K with no reduction in I/O count, M/Es, keyers or DPMs regardless of format: HD, 1080p, 3G, or 4K UHD (2160p). Build the same high-quality productions you always have, but in 4K.

The K-Frame XP makes 8K productions possible by using the full raster 4K 2160p processing and EZ-8K Mode. The K-Frame XP becomes an 8K switcher with up to 48 inputs x 24 outputs and 4 M/Es (three keyers with 2D DPMs with perspective each). The workflow, E-MEMs, and macros are the same as in the HD and 4K UHD productions.

The K-Frame XP and V-series frames have both SDI and IP I/O cards supporting the SMPTE ST 2110 industry standard. The K-Frame SXP has up to 192 inputs and 96 outputs with up to 10 16x8 I/O cards and 4

8x4 I/O cards. The K-Frame CXP has up to 80 inputs and 40 outputs with 4 16x8 and 2 8x4 I/O cards. The configuration of the IP I/O cards can be simplified using IS-04 and IS-05 or by importing a specially formatted Excel spreadsheet.

Even with the more affordable V-series, you can be confident that when you transition from traditional HD to 3G or 4K, your switcher maintains its value while not putting additional strain on your CapEx budget. With EZ-4K, the K-Frame V-series switcher is changed into a 4K switcher with 2 M/Es with two full-function keyers per M/E. The workflow, E-MEMs and macros are the same as in HD productions.

Support for Dolby HDR is standard all K-Frame Video Production Centers.

Key Features

K-Frame XP

SXP Frame:

- Up to 192 inputs and 96 outputs (all SDI, all IP or mixed)
- Up to 9 M/Es

CXP Frame:

- Up to 80 inputs and 40 outputs (all SDI, all IP or mixed)
- Up to 6 M/Es
- Full raster processing for 2160p productions with no loss of resources
- EZ-8K Frame Operating Mode
- Every M/E has six keyers with keying modes including chromakey, 2 frame stores, 2D DPMs with perspective. Every keyer can use optional 3D iDPMs from a pool of floating 3D DPMs
- 2D DPMs (resizers) with perspective on every keyer
- Up to 16 iDPMs (integrated Digital Picture Manipulators), assigned as either floating iDPMs or within an eDPM at user's discretion
- Optional multiple multiviewer capability with 6 pre-configured layouts (maximum 16 panes per layout) with On-Air and Preview tally
- Optional integrated ImageStore with 8 channels of video/key outputs and 4 pairs of video/key inputs, capable of delivering up to 128 GB storage of stills or "movies" with audio
- Frame Operating Modes of 720p and 1080p with HDR support are standard. 1080p, 2160p (full raster processing) and EZ-8K can be added with one software license
- Every input has UltraMatch, which automatically converts 1080p or 2160p sources into the frame operating mode format of 2160p or 1080p

K-Frame V-series Frame

- Up to 36 inputs and 18 outputs
- Up to 3 M/Es plus 2 VPEs, accessible across 4 suites by using DoubleTake™ this may be increased to 10 virtual M/Es
- Every M/E and VPE has 4 keyers with standard keying modes including chromakey, 2 frame stores per keyer. Every keyer can use the pool of optional floating 3D iDPMs
- 2D DPMs (resizers) on every keyer, with 4 pairs per M/E and VPE
- Up to 4 optional iDPMs (integrated Digital Picture Manipulators), assigned as either floating iDPMs or within an eDPM at user's discretion
- Multiple multiviewer capability with 5 pre-configured layouts (maximum 14 panes per layout) with On-Air and Preview tally
- EZ-4K Frame Operating Mode
- Optional integrated ImageStore with 8 channels of video/key outputs and 4 pairs of video/key inputs, capable of delivering up to 32 GB storage of stills or "movies" with audio
- Frame Operating Modes of 525i, 625i, 720p and 1080p and HDR support are standard. 1080p, 2160p/EZ-4K can be added with one software license

General for all K-Frames

- Fully digital 10-bit 4:2:2 video switcher
- Optional Format Conversion Card modules provide up/down/crossconversion when licensed with SetDef/MatchDef
- Integrated macro builder/editor allows users to edit macros online or offline on a PC running the menu application
- Optional DoubleTake (split M/E mode) effectively increases the number of M/Es and adds flexibility to Suites operation while FlexiKey™ programmable clean feed mode supports separately programmable configurations of keyers from four M/E outputs

- Aux bus transitions for dissolves/wipes on aux bus outputs
- Interfaces with Grass Valley routers and Kaleido™ multiviewers and their control systems
- LDK Series & LDX Series® camera control with Ethernet tally via Connect Gateway
- 999 macros with many new ways to recall macros from the panel
- 1,000 E-MEM™ registers with Define E-MEM for fine control in creation and editing of effects
- Optional M/E Previewer provides a method to check and monitor any input to an M/E and any M/E's output (except in V-series)
- VDCP Ethernet connection for stadium applications
- Ethernet tally connection for integration with external tally systems
- Optional RGB color correction on M/E buses and aux bus outputs
- Source rules:
 - Links keyers to sources
 - Settings for on-off-left alone on every M/E
 - Full look-ahead preview of rules
- Hot-swappable, front/rear removable modules and power supplies
- All frames can be controlled via Ross Video Overdrive automation
- Ross Video Dashboard can control all of the K-Frame switchers
- Integrated control of graphics:
 - Chyron graphics products using specialized VDCP
 - XPressions graphics engine using RossTalk protocol
- Daktronix devices via VDCP and the Daktronix can recall macros on the K-Frame switcher



K-Frame XP I/O Card Features: UltraMatch, GearBox, MatchSync and Extended Buffers

UltraMatch enables every input to be configured as 2160p or 1080p and converted to the Frame Operating Mode of 2160p or 1080p. Any output can be configured as 2160p or 1080p. This is extremely useful for dual feed productions and/or using existing 1080p monitors in a 2160p production. This is a standard feature on every K-Frame XP I/O card.

The **GearBox** controls on every K-Frame XP I/O board allow you to use quad-link 2SI or quad-link SDQS for inputs and outputs in addition to the 12G SDI or IP video.

The SDI GearBox I/O Boards also include **MatchSync**, which helps with timing when mixing SDI and IP sources.

The K-Frame XP IP I/O cards have been updated with **Extended Buffers**, providing many of the same capabilities as an input Frame Sync and adapting to a wide variety of input timing issues.

Mixing Panels and Frames

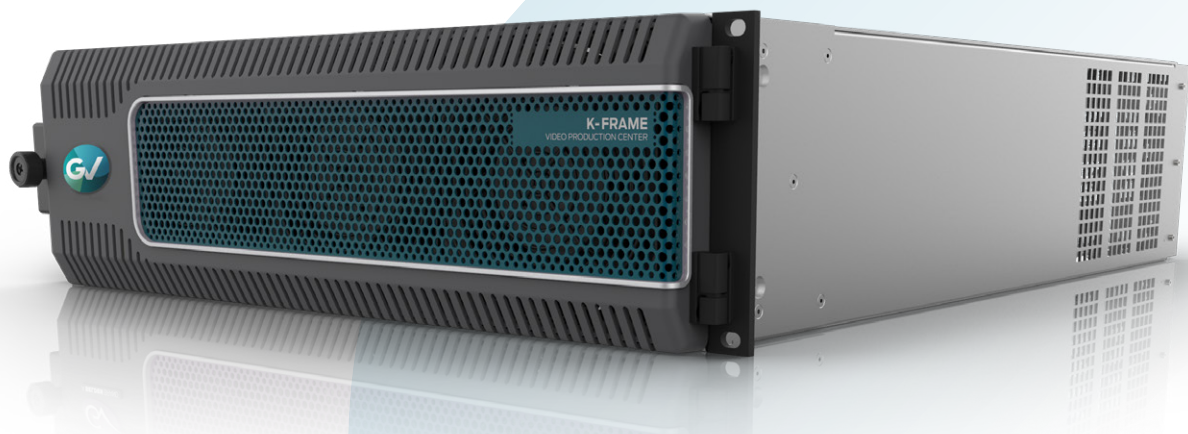
Any Kayenne, Karrera, GV Korona and KSP control surfaces can drive any K-Frame video processing engine: K-Frame SXP and CXP, K-Frame V-series and even K-Frame CS X for production in the cloud or as an on-prem processor. This gives you the ability to switch today's productions on a panel that meets your budget and production needs, with the ability to run on any frame.

The K-Frame V-series 3 RU frame with internal power supply supports four I/O modules and a maximum of 36 inputs – 32 SDI and 4 Media Ports, and 18 outputs – 16 SDI and 2 Media Ports. Up to 3 M/Es plus 2 VPEs (Video Processing Engines) are accessible across four suites. By using DoubleTake, this may be increased to 10 virtual M/Es. Every M/E and VPE has four keyers with standard keying modes including chromakey, two frame stores per keyer – and every keyer can use the pool of optional floating iDPMs and the 2D DPMs on each keyer.

Independent Suites

K-Frame Suites enable you to share resources in one video processor frame across four different production suites while completely isolating the resources in one suite from the other. Each K-Frame suite has its own logical M/Es, aux buses, E-MEM and macro system. The same E-MEMs, macros and Show files can load into any suite and will run the same way and not interfere with a production in another suite.

Each K-Frame suite supports two control panels, each with its own user preferences, to give you a collaborative user configuration. The two users share resources such as M/Es, DPMS, and E-MEM, but can run macros independently. Each user has their own set of user preferences to configure their control panel. Although this is useful for some productions, the K-Frame Switchers give you both true suites configurations and collaborative configurations at the same time. Collaborative Suites may be the only "suites" mode available on competing switchers.



Grass Valley production switchers bring an unsurpassed level of performance to live productions with the innovative features and upgradability expected from a strong history of exemplary switcher solutions.

The K-Frame video processing engine brings a software-based, modular approach to switcher frames that provides simple upgradability, more efficient operations, simplified production workflows, as well as easy configuration and setup. K-Frame requires less initial capital investment and brings the ability to configure a video production switcher with full multiformat support – including 1080p 50/60, and 2160p for 4K and 8K.

High Value Production Platform

Grass Valley production switchers package higher performance, processing, capabilities and usability into solutions unmatched by any other vendor. This makes them powerful, creative production solutions, and smart business propositions.

In addition to being cost-effective, Grass Valley video production switchers offer long-term savings with a wide variety of configuration options in both

hardware and software. Features including 1080p/2160p support are implemented with simple to install software licenses, enabling the system to grow to suit both present and future needs.

Familiar Grass Valley controls and intuitive interfaces mean that minimal training time is required, which translates into faster setups and an ideal situation for rental and mobile production companies dependent on a freelance workforce.

Immersive User Experience

Configuration, setup and operation are all streamlined to make users more efficient and require fewer resources per production.

The ergonomically designed and finely tuned control panels make users more efficient by providing the most used functions front and center while also giving quick access to in-depth features. The panels utilizes crisp OLED displays for source and

function names, and all pushbuttons have full RGB color illumination to permit custom color schemes which dynamically change for color-coding functions and source grouping.

The high-resolution touchscreen interface has a shallow menu structure including History and Favorites features that operators find extremely useful, and context sensitive pull-down menus that put everything at their fingertips.

Source Rules to simplify accurate key-to-source relationships, E-MEMs with Define E-MEM for granular control, P-MEM for panel memory and pre-built macros all can be recalled from the panel, and many of these functions can be delegated to rows within an operator's easy reach.

Feature		K-Frame XP – Standard	K-Frame XP – Compact	K-Frame V-series
Frame Size		15 RU (plus 1 RU external PS)	8 RU (internal PS)	3 RU (internal PS)
4K Support		Yes – Full Raster Processing	Yes – Full Raster Processing	Yes
3G Support		1080p 50/60, level A	1080p 50/60, level A	1080p 50/60, level A&B
12G Support		Two single streams per 25 GbE SFP, one per 12G-SDI link	Two single streams per 25 GbE SFP, one per 12G-SDI link	Two single streams per 25 GbE SFP, one per 12G-SDI link
Max. I/O	(3G, HD)	192 x 96	80 x 40	32x16 SDI, 4x2 Media Port
	(UHD)			8 x 4
Max. M/Es / VPEs	(3G, HD)	9 M/E	6 M/E	3 M/E plus 2 VPE
	(UHD)			2 M/E plus 1 1080p
Full Keyers per M/E / VPE	(3G, HD)	6	6	4
	(UHD)			2
Max. iDPM Channels	(3G, HD)	16	16	4
	(UHD)			1
2 DPMs on all M/E Keyers		Yes (with perspective)	Yes (with perspective)	Yes
IS-04 & IS-05 Support		Yes	Yes	Yes
PTP Support		Yes	Yes	No
ImageStore Support		Stills and Movies w/audio	Stills and Movies w/audio	Stills and Movies w/audio
Multiviewer Support		4	4	2

Each K-Frame XP switcher provides more processing power per module with full raster 4K 2160p video processing, supporting six keyers, an array of digital effects processors types, including 2D PM with perspective, and a significant increase in inputs and outputs compared to competitive offerings. The production switcher keyers give operators more integrated keying capabilities – such as chromakey, memory store and picture processing – as well as flexibility in assignment of keyers to provide more advanced overlays per production.

M/E functionality can be expanded with the DoubleTake software option that has the power to split an M/E bank and assign keyers to each partition, each of which has its own dedicated backgrounds to effectively double the number of M/Es per system with no change in physical hardware to assist users in creating more complex effects. Tools like Layering Mode, DoubleTake, FlexiKey programmable clean feed and transition chaining with automatic source substitution, make complex multiclient live productions much easier and safer to accomplish.

Image processing is extensive with assignable software-based effects processing, assignable I/O image scalers, input resizers and an integrated ImageStore that give users the flexibility they need to create sophisticated on-air looks.

Source Rules automatically add and drop keys when a source is selected – without using macros or E-MEMs. Source Rules also apply during lookahead previews for transitions.

K-Frame File Compatibility

All switcher panels and K-Frames maintain show file compatibility. This not only gives you the ability to move a show file on a thumb drive between similar panel/frame configurations, but to take the entire show or elements of a show from one production to another production that has a different panel or K-Frame processing engine or video format.

This feature saves TDs not only time, but the hassle of having to re-create a show or show elements when moving between panels or frames.

The technology Grass Valley uses to support this feature is unique within the industry.

Up to 999 macros can be recalled in many new ways from the panel, and then fine-tuned with an integrated Macro Editor.

Delegation of macros, E-MEM, aux bus and router control to the control panel's source-select rows ensures that controls are within reach when they are needed. Background buses can be delegated to keyer rows to expand the number of sources on an M/E. Panel Memory stores up to 99 delegation patterns.

Define E-MEM exposes granular sublevels within an M/E or top level E-MEM layers for partial keyframing and allows both fine tuning of effects within a layer as well as the pushing of control of individual effects assets, such as aux bus or servers to M/E layers.

Aux bus transitions permits the switcher to be fully utilized for every production. Dissolves and wipes on aux bus transitions are provided to enhance the look of in-studio, onstage monitors.

A cost-effective option for productions with lower source counts is the internal multiviewer capability. With six pre-configured screen layouts to choose from, up to 16 tiles per layout with On-Air and "Look Ahead" Pre-view tally, along with customizable labelling. Logical and fixed sources come from the menu name while Aux sources come from the aux name.

Powerful Processing, with a User's Choice

All Grass Valley production switchers support multiformat productions.

The **K-Frame XP** supports the following Frame Operating Modes:

- 720p (50 Hz, 59.94 Hz, 60 Hz)
- 1080i (25 Hz, 59.94 Hz, 60 Hz)
- 1080p-A (23.98 Hz, 24 Hz, 25 Hz, 29.97 Hz, 30 Hz, 50 Hz, 59.94 Hz, 60 Hz)
- 2160p (23.98 Hz, 24 Hz, 25 Hz, 29.97 Hz, 30 Hz, 50 Hz, 58.94 Hz, 60 Hz)
- 8K 2SI (23.98 Hz, 24 Hz, 25 Hz, 29.97 Hz, 30 Hz, 50 Hz, 58.94 Hz, 60 Hz)
- 8K SQDS (23.98 Hz, 24 Hz, 25 Hz, 29.97 Hz, 30 Hz, 50 Hz, 58.94 Hz, 60 Hz)

The **K-Frame V-series** supports the following Frame Operating Modes:

- 525i, 625i
- 720p (50 Hz, 59.94 Hz, 60 Hz)
- 1080i (25 Hz, 59.94 Hz, 60 Hz)
- 1080sf (23.98 Hz, 24 Hz, 25 Hz, 29.97 Hz, 30 Hz)
- 1080p-A (50 Hz, 59.94 Hz, 60 Hz)
- 1080p-B (50 Hz, 59.94 Hz, 60 Hz)
- 4Ksf 2SI (23.98 Hz, 24 Hz, 25 Hz, 29.97Hz, 30Hz)
- 2160p – 4K 2SI (50 Hz, 59.94 Hz, 60 Hz)

All K-Frame processing engines (K-Frame SXP, CXP, V-series and K-Frame CS X), work with any K-Frame control panel (Kayenne, Karrera, Korona and KSP). So your video processing selection ranges from the V-series (3 RU frame with

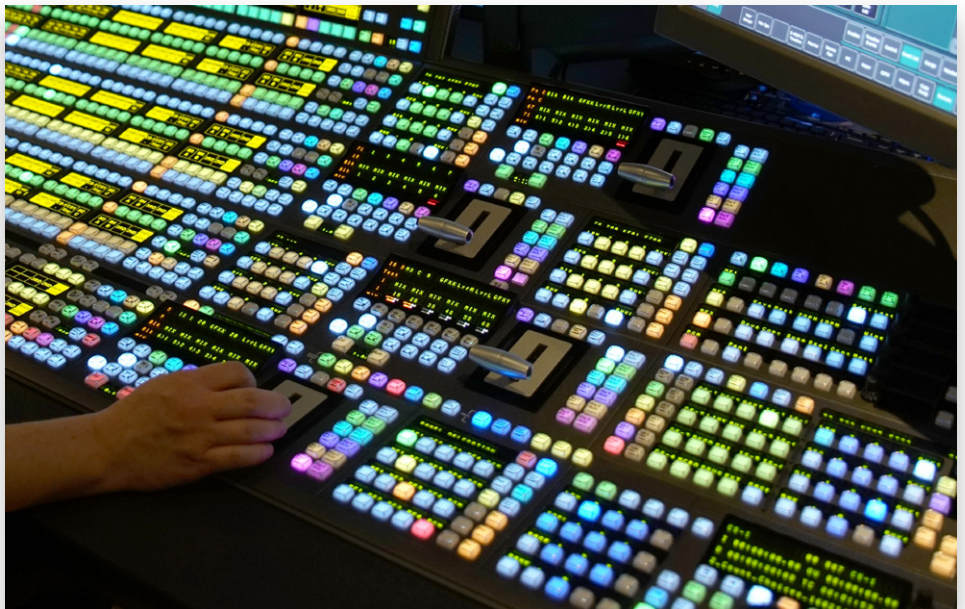
internal power supply, up to 36 inputs and 18 outputs with 3 M/E and two VPEs – four keyers each and up to two multiviewers), up to the K-Frame SXP (15 RU processing frame plus 1 RU power supply, up to 196 inputs, 98 outputs with 9 M/Es (six keyers each), 16 iDPMs and eight video/key channels of Image Store and up to four multiviewers) or even to the K-Frame CS X (in the cloud or on-prem). The control panels range from the software-based Kayenne Software Panel (KSP) to the 1-stripe, 15-crosspoint Korona panel to the 5-stripe, 30-crosspoint button Kayenne control panel. You select what is right for your production and budget.

All processing frames offer an optional Format Conversion I/O Card that includes format conversion hardware for all eight inputs and four outputs. This means that the video scalers are both internal and fully integrated in the control systems. The SXP and the V-series can have up to four of these Format Conversion I/O

Cards. The CXP has up to two of the Format Conversion I/O Cards. And don't forget that UltraMatch provides conversion between 2160p and 1080p on every input and output of the K-Frame XP systems.

K-Frame XPs' internal ImageStore has four paired video/key inputs and eight paired video/key outputs. The memory storage capacity of up to 128 GB for the XP and 32 GB in V-series, is available for instant recall of stills and movies with audio.

The K-Frame V-series is a no-compromise low/mid-range range switcher providing an unbelievable amount of production power at an affordable price. The switcher comes with two M/E / VPE boards that supports three licensable M/Es and two VPEs with four keyers each and multiviewers options. The controller board also houses the large ImageStore. GV Korona K-Frame V-series systems are designed to offer maximum features at a minimum price.



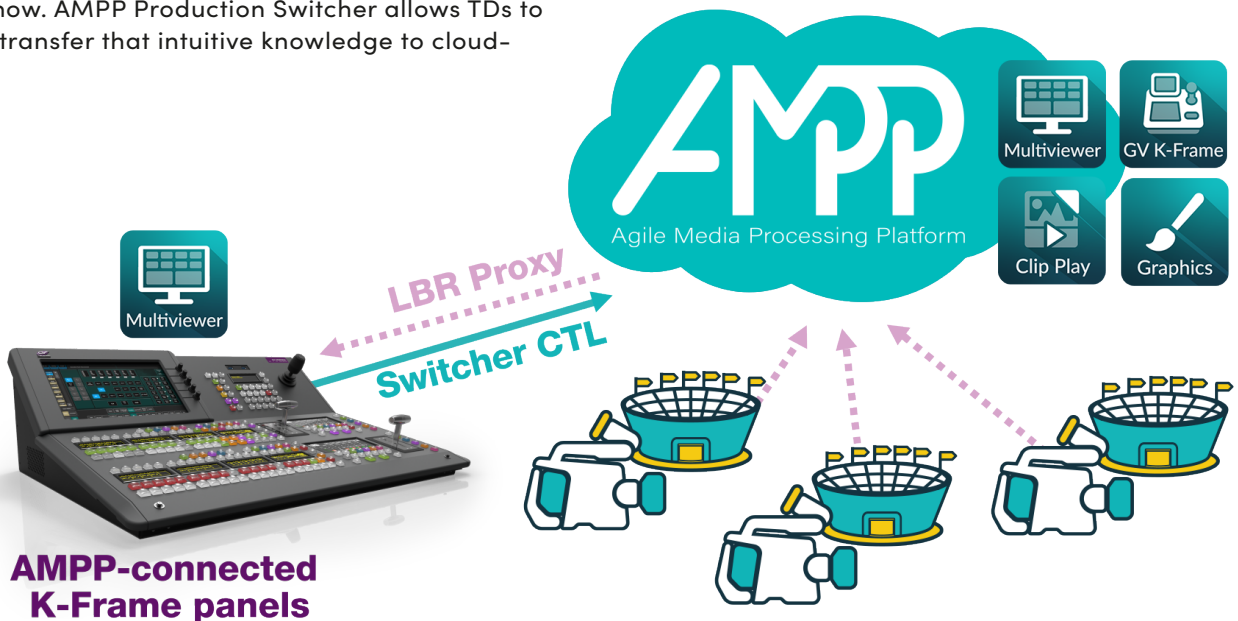
GV K-Frame CS X

Grass Valley continues to fulfill its commitment to provide any panel for any engine across its series of video production centers. Kayenne, Karrera, Korona and KSP control surfaces connect with GV K-Frame CS X to provide a simple transition to cloud-based video production. Any panel from the series operates in the same way regardless of the production environment. TDs can get right to work – even transferring show files between AMPP® and K-Frame engines.

For many TDs, operating a production switcher is done by muscle memory, knowing a panel so well that it is an automatic extension of the hands while the conscious attention focuses on the incoming video sources and cues to switch a show. AMPP Production Switcher allows TDs to immediately transfer that intuitive knowledge to cloud-

based video production. Button presses and transitions respond without delay, providing the precise control TDs have come to expect from Grass Valley production switchers.

With three M/Es, each M/E with six keyers and each keyer with a 2D DPM, operators have the creative resources required for professional video production. Stills and animations with fill/key including transparency also provide a polished production look. Those looks are easy to create and store with hundreds of E-MEMs and macros available for recall at the touch of a button with the familiar Grass Valley feel.



**AMPP-connected
K-Frame panels**

Extensive Digital Effects Availability

The iDPMs (integrated Digital Picture Manipulators) are licensed in groups of two, they come complete with 2D, 3D and defocus effects. The K-Frame XP frames can have up to 16 iDPMs and the V-series frame can have up to 4 iDPMs. The iDPMs are floating licenses and can be assigned to any full M/E keyer. iDPM includes extensive Kurl™ nonlinear warp effects such as corner pinning, page turn, page roll, slits, mirrors, spheres, defocus, glow and output recursive effects for unlimited creative application.

An alternative use for the iDPM channels is to use them inside the eDPM system, which uses a separate control system, and which also allows effects to be taken to air on any M/E as a single source. Up to six iDPMs and six 2D DPMs can be incorporated within a single eDPM to provide the advantage of an external digital effects, compositing multiple channels to re-enter on one or more keyers with its own independent E-MEMs. The eDPM channels provide the advantage of an external DVE compositing multiple channels to reenter on one or more keyers.

Any M/E key bus can be resized and repositioned using the 2D DPM systems. One global license activates all 2D DPMs available on the video frame – the number of 2D DPMs depends on the number of keyers in the switcher. The K-Frame XP 2D DPM add Pitch Controls to enable perspective effects that do not require a 3D iDPM.

Completely Self-Contained Multiformat Video Production

The SetDef output conversion, combined with MatchDef input conversion, allows complete, multiformat production with up/down/ crossconverting of all input and output formats, including aspect ratio conversion for SD video.

The converters are not limited to simple vector scaling, but also allow cross-conversion of SD, HD and/or 3G formats with color space conversion when converting to/from HD and SD, motion adaptation, and full synchronization. Signals converted with MatchDef video input converters may be used anywhere within the system, sent to any output (including aux buses), and they do not consume expensive resources such as an entire M/E bus or other M/E resources.

The optional SetDef and MatchDef on the K-Frame XP add additional capabilities for 2160p support and include conversion/gearboxing to and from 2160p full raster, SQDS and 2SI.

In addition, UltraMatch enables every input and output to be configured as 2160p or 1080p video and converted to the Frame Operating Mode of 2160p or 1080p. UltraMatch is a standard feature on every K-Frame XP I/O Card. This is extremely useful for simultaneous HD and UHD productions and/or using existing 1080p monitors in a 2160p production.

The K-Frame XP SDI GearBox Boards can bring in 2160p video as a 12G single stream or as quad-link 2SI or quad-link SDQS.



The nature of IP video requires buffering at the input of every video source – that is not required for SDI sources. This input buffering adds delay to the incoming IP video, which could complicate the timing of both types of sources to the one switcher. The SDI GearBox Board with MatchSync will delay the SDI inputs by the same amount, simplifying the system timing.

Multiple Show Feeds with a Single Technical Director

The optional FlexiKey and DoubleTake split layered modes are available for all M/Es. Control is enhanced on the panel by dedicated primary/secondary partition buttons, and the use of the Kayenne split lever arm. Transition Chaining augments parallel video paths using Key Chaining, Background Chaining and Partition Sync functions to simplify productions requiring multiclient feeds from one operator.

Remote Productions

The control panels for the K-Frame family have been used in many remote operations, including those where the control panel is located far from the frame. We continue to evolve the design to match the ever-growing need for remote productions.

Work Offline with Windows-based KSP, Menu and Frame Simulators

The K-Frame Soft Panel (KSP), menu and frame simulator have many uses. Engineers can create or edit engineering configurations files. TDs can create, manage and edit show files, E-MEMs and macros on their own laptop. The menu and frame simulators run on a Windows computer. There is a frame simulator for every model of K-Frame switcher and the same menu runs across all frames. The menu and frame simulators are free. The KSP is a software option for K-Frame Switchers, but works with any frame simulator at no cost.

For training, the K-Frame menu, KSP and frame simulators allows TD to learn the K-Frame workflow without access to a K-Frame switcher. Experienced TDs can try out new features. These lessons transfer to any of the models and panels of K-Frame switcher.

The K-Frame supports a second menu for productions. It can be used to: save and load stills and movies to the Image Store; convert stills and movies to the Image Store format and load macros, E-MEMs and show files. The EIC can use it to remotely check the switcher status, change its configuration, access logs and diagnostics.

CONTROL PANELS

Kayenne Modular Control Panels

Each module of the Kayenne control panel snaps into an extruded aluminum tray, is easily removable, and is hot-swappable. This modularity provides multiple panel configurations ranging in depth from 2 to 4 M/E stripes and a width choice of 25 or 35 (on selected models) source select buttons per row. The control panels are ergonomically designed and can be mounted flat or in a banked curve.



Each source select and aux bus module has two rows of OLED Source Name Displays that provide ultra-clear text and extremely wide viewing angles. All buttons are illuminated with a selection of RGB colors, which dynamically change to indicate context (M/E colors, key colors, source colors and function colors). Many buttons also have programmable soft functions, which are indicated by a four-character LED display above them, such as those found on the innovative Multifunction Module. Transition Modules have Enhanced Status Displays using easy to read LEDs.

The Kayenne's Device Control Module (DCM) supports full motion control (including jog wheel) for up to 28 devices such as DDRs/VTRs. Another unique feature is Q-MEM, a library of device cues independent of E-MEM, which operate in conjunction with the DCM and the up to six Device Control Windows on the system bar.

The user-friendly menu system also leads the industry with simplified navigation so that no menu view is more than two levels deep. Each menu is assisted by favorites, history and semi-transparent pull-down quick-links. Better yet, it is the same across Kayenne, Karrera and GV Korona control surfaces for quick recognition and ease of use.

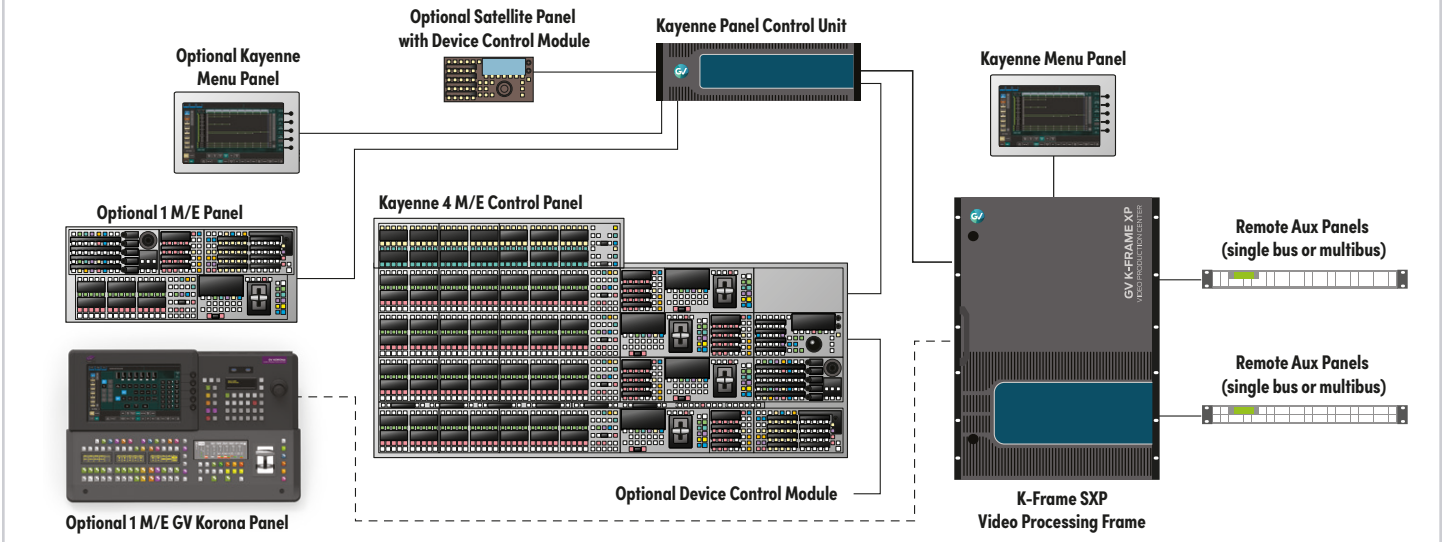
Additionally, the intuitive menu view is incorporated into an optional control panel called the Kayenne Soft Panel or KSP. The KSP is an easy-to-use 1 M/E soft-panel GUI paired with a custom keyboard that can be used in many environments as a secondary control for replay or alternate event feeds.

Panel Control Unit

The Kayenne switcher control panels run silently with no fan noise as their CPUs are located remotely in a 3 RU panel control unit (PCU) and the touchscreen menu panel is driven by a fanless PC.

Each PCU supports one or two control surfaces, either in the same or different logical suites. A control surface typically consists of M/E stripes, a local aux stripe, plus a touchscreen menu panel with five knobs. This may be augmented with satellite panels consisting of one or two modules. Each PCU has eight ports that connect to panel stripes or satellite panels. The PCU can be mounted up to 15 meters away from the main panel. The fanless PC driving the touchscreen menu can be attached to the back of the menu or located nearby.

Kayenne System Setup Options



Kayenne Control Panel Features In Depth

- Modular control panel surface with hot-swappable modules
- Completely quiet environment at the technical director's fingertips, as the control panel has no fans or processors to create noise
- RGB button illumination highlights for context and function clarity
- System bar on panel with up to six device control windows, switched preview, aux bus delegation and macro controls
- Optional panel Device Control Module for integrated machine control with Q-MEM cue library for server/VTR content
- Works with every K-Frame from the K-Frame SXP to the K-Frame CS X
- Powerful Panel memory enables you to change the panel behavior as needed for different segments in the same show

Kayenne System Ordering

Select a System

Choose a PRO, ELITE or EXTREME XP Performance Suite if desired

Customize with Options as needed

XP Performance Suites

PRO:

Nomenclature: K-FRM-PRO-XP-PS

- ImageStore with license to enable 32 GB of storage
- License to enable two chromakeyers
- FlexiKey license for programmable clean feed
- License to enable two iDPMs (requires purchase of (1) K-FRM-DPM-XP board)

ELITE:

Nomenclature: K-FRM-ELITE-XP-PS

- ImageStore with license to enable 64 GB of storage
- License to enable all chromakeyers
- FlexiKey license for programmable clean feed
- License to enable eight iDPMs (requires purchase of (1) K-FRM-DPM-XP board)
- License to enable DoubleTake

XTREME:

Nomenclature: K-FRM-XTREME-XP-PS

- ImageStore with license to enable 128 GB of storage
- License to enable all chromakeyers
- FlexiKey license for programmable clean feed
- License to enable ALL iDPMs (requires purchase of (2) K-FRM-DPM-XP boards)
- License to enable DoubleTake

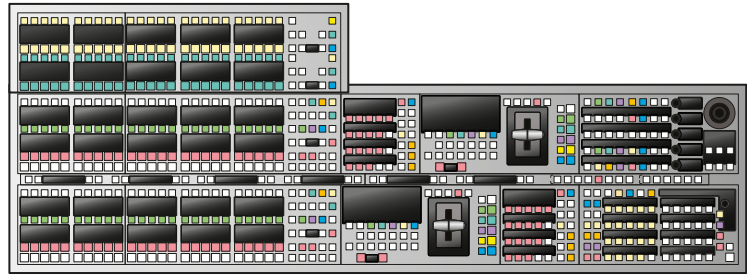


Kayenne Ordering

KAYN-PNL-200-25 or -35

2 M/E panel with 25- or 35-button source selectors
 Panel control unit
 15:9 touchscreen menu panel
 Two 25- or 35-button source select modules
 One 25- or 35-button local aux module

Two local E-MEM modules
 One master E-MEM module
 Two transition modules
 One multifunction module
 System bar
 Manual set
 Cables

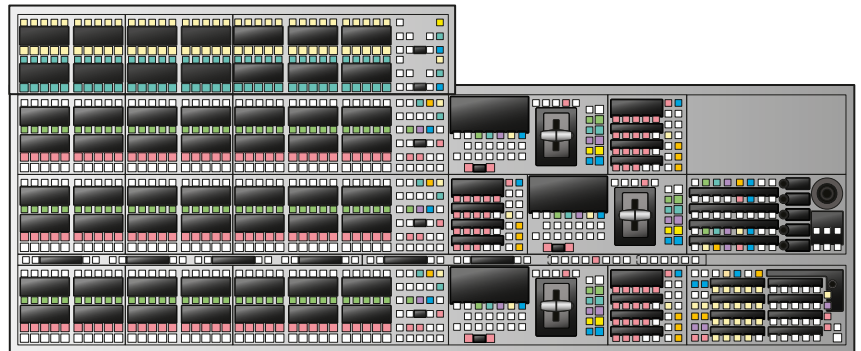


KAYN-PNL-200-25

KAYN-PNL-300-25 or -35

3 M/E panel with 25- or 35-button source selectors
 Panel control unit
 15:9 touchscreen menu panel
 Three 25- or 35-button source select modules
 One 25- or 35-button local aux module
 Three local E-MEM modules

One master E-MEM module
 Three transition modules
 One multifunction module
 System bar
 Manual set
 Cables
 One option slot (DCM shown)

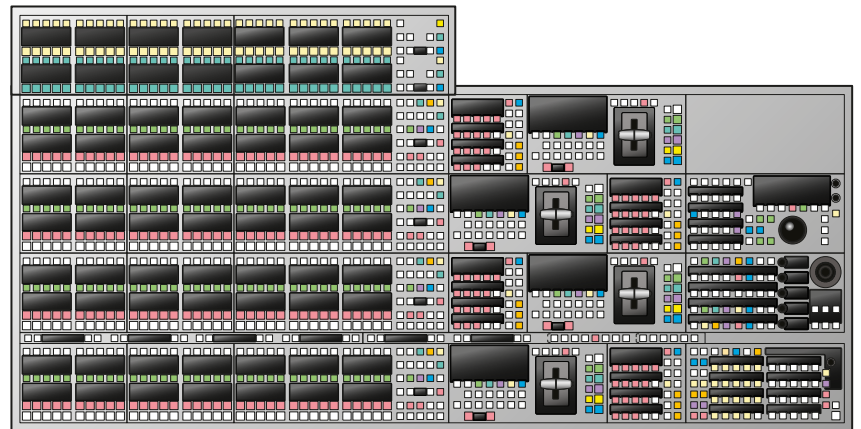


KAYN-PNL-300-35

KAYN-PNL-400-25 or -35

4 M/E panel with 25- or 35-button source selectors
 Panel control unit
 15:9 touchscreen menu panel
 Four 25- or 35-button source select modules
 One 25- or 35-button local aux module
 Four local E-MEM modules
 One master E-MEM module

Four transition modules
 One multifunction module
 System bar
 Manual set
 Cables
 Two option slots (one DCM shown)



KAYN-PNL-400-35

Karrera Control Panel

Karrera K-Frame Control Panel is designed for shows that need high production values without the high budget. It is a powerful mid-level control panel with all of the ease of use, workflow and flexibility of the K-Frame family of switchers. It works with any switcher frame in the K-Frame family and is available in a 25 crosspoint 2 M/E version and a 35 crosspoint 3 M/E version.



The Karrera Control Panel has the same workflow as the Kayenne Control Panel, in a smaller physical and budgetary footprint. Any panel, any frame means that you choose the control panel and the video processing frames that fit your needs and budget.

The Karrera Control Panel builds on Grass Valley's legendary ease of use, which simplifies the running of the most complex productions. Operators can rapidly build, save, punch and load shows for optimum efficiency.

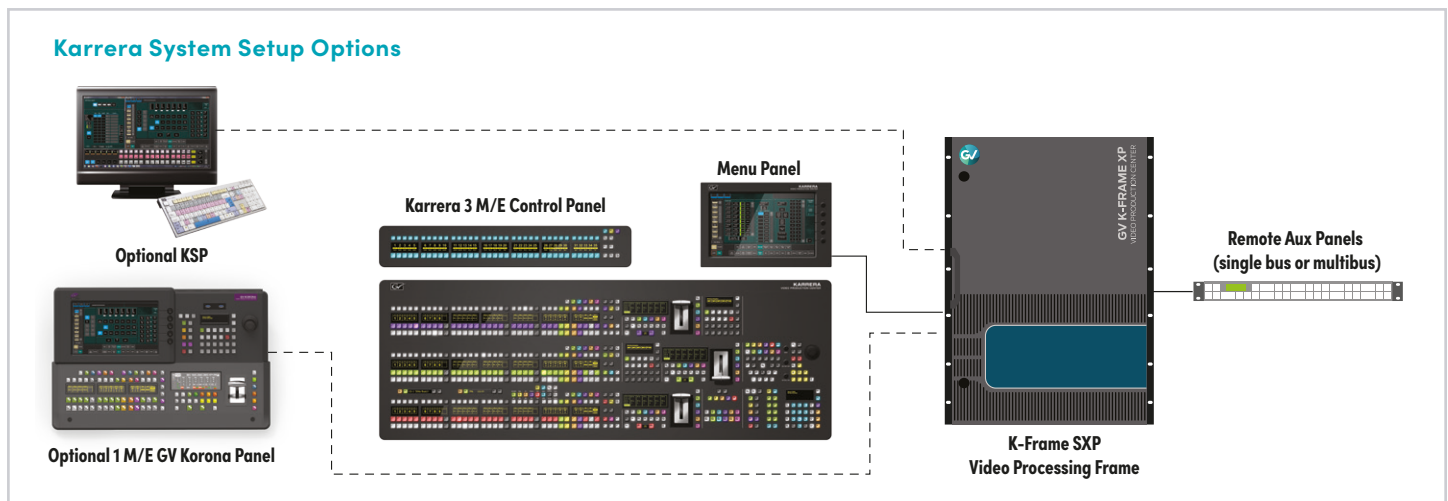
These highly familiar workflows help prevent on-air errors, and simplify the hiring and management of operator teams.

This exceptional breadth of capabilities makes these switchers ideal for a wide range of environments, from mobile trucks to fixed facilities. Typical applications include stadiums, broadcast facilities, production houses, corporate studios, houses of worship and educational media.

Many advanced features — including DoubleTake (split M/E mode) and Source Rules — can be enabled with software licenses to further customize the configuration and minimize up-front costs and they are all accessible from the Karrera Control Panel.

Karrera Control Panel Features In Depth

- Stripes are fully configurable to control any M/E, complete with local E-MEM areas
- Crisp OLED displays and customizable RGB buttons enable perfect visual cues
- External touchscreen menuing system runs the same software as every other panel
- Device control can be performed through the menu, the transition touchscreen or a delegation of the keyer bus
- The same powerful Panel Memory as the Kayenne Control Panel
- Optional local and remote aux bus control panels
- Works with every K-Frame from the K-Frame SXP to the K-Frame CS X



Select a System

Choose a PRO, ELITE or
EXTREME XP Performance
Suite if desired

Customize with
Options as needed

All Karrera Systems (Includes the KRR-PNL-MENU-SET and license to enable all 2D DPMs on licensed M/Es.)

K-Frame CXP systems come with additional licenses which provide tremendous value and can be seen below.

XP Performance Suites

PRO:

Nomenclature: K-FRM-PRO-XP-PS

- ImageStore with license to enable 32 GB of storage
- License to enable two chromakeyers
- FlexiKey license for programmable clean feed
- License to enable two iDPMs (requires purchase of one K-FRM-DPM-XP board)

ELITE:

Nomenclature: K-FRM-ELITE-XP-PS

- ImageStore with license to enable 64 GB of storage
- License to enable all chromakeyers
- FlexiKey license for programmable clean feed
- License to enable eight iDPMs (requires purchase of one K-FRM-DPM-XP board)
- License to enable DoubleTake

XTREME:

Nomenclature: K-FRM-XTREME-XP-PS

- ImageStore with license to enable 128 GB of storage
- License to enable all chromakeyers
- FlexiKey license for programmable clean feed
- License to enable ALL iDPMs (requires purchase of two K-FRM-DPM-XP boards)
- License to enable DoubleTake

Karrera K-Frame CXP 2 M/E Systems

KRR-2-25-C-2M-CXP (-I)

Karrera K-Frame CXP 2 M/E system. Includes control panel, video frame and licenses

2-stripe (2 M/E) Karrera compact panel (KRR-PNL-200-25-C) with touchscreen menu panel set (KRR-PNL-MENU-SET)

GV K-Frame XP – Compact 8 RU (K-FRM-100CXP or K-FRM-100CXP-I) which includes:

- One XP Controller module (K-FRM-CTRL-CXP) with onboard ImageStore
- One Video Processing Engine module (K-FRM-VPE-XP)
- Two power supplies (K-FRM-PSU-XP)
- Two I/O boards (K-FRM-IO-FULL-X-GB) or (K-FRM-IO-FULL-X-I)

Software licenses include:

- Two M/E licenses (K-FRM-LIC-ME)
- 12 2D DPMs with perspective (K-FRM-LIC-2DDPM-XP)

Karrera K-Frame CXP 3 M/E Systems

KRR-3-35-3M-CXP(-I)

Karrera K-Frame CXP 3 M/E system. Includes control panel, video frame and licenses

3-stripe (3 M/E) Karrera compact panel (KRR-PNL-300-35) with touchscreen menu panel set (KRR-PNL-MENU-SET)

GV K-Frame XP – Compact 8 RU (K-FRM-100CXP or K-FRM-100CXP-I) which includes:

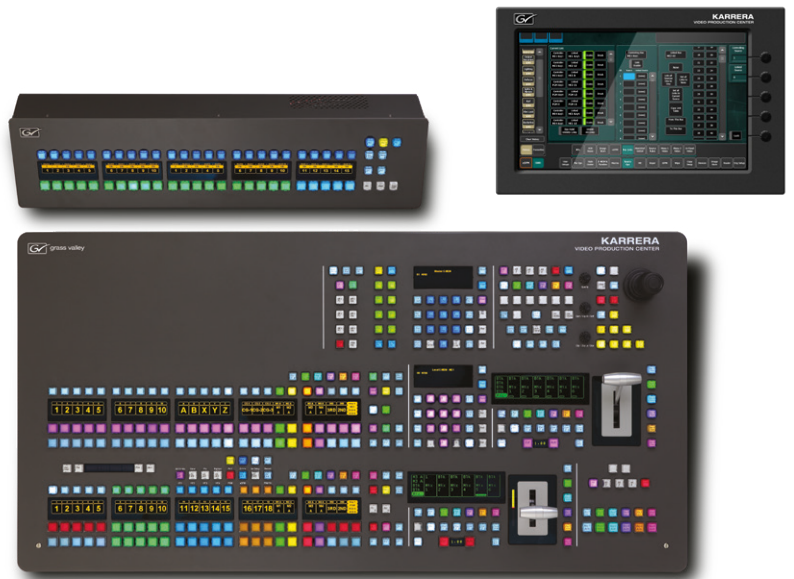
- One XP Controller module (K-FRM-CTRL-CXP) with onboard ImageStore
- One Video Processing Engine module (K-FRM-VPE-XP)
- Two power supplies (K-FRM-PSU-XP)
- Two I/O boards (K-FRM-IO-FULL-X-GB) or (K-FRM-IO-FULL-X-I)

Software licenses include:

- Three M/E licenses (K-FRM-LIC-ME)
- 18 2D DPMs with perspective (K-FRM-LIC-2DDPM-XP)

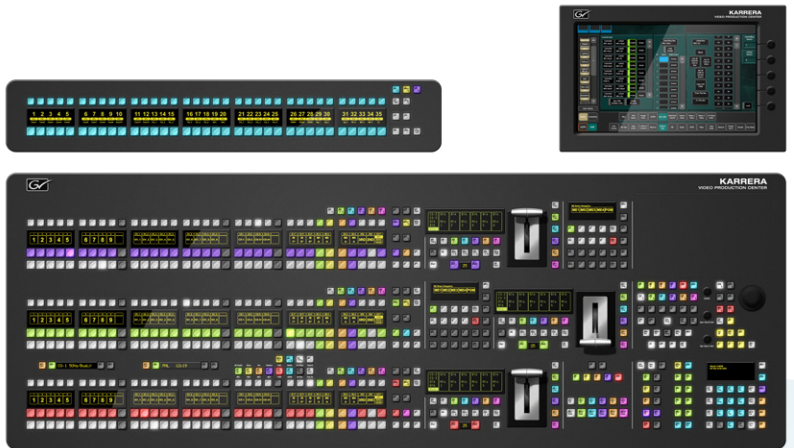
KRR-PNL-200-25-C

2 M/E Karrera compact panel with 25 button source selectors. Includes two 25-button source select stripes, one 20 meter Ethernet cable and a System Control area with one device control sub-section, switched preview, aux bus delegation and macro controls, with controls for background and keyer source selection, master E-MEM, local E-MEM and horizontal keyer cut/mix. Optional Aux Panel and Menu display sold separately.



KRR-PNL-300-35

3 M/E Karrera panel with 35 button source selectors, Includes three 35 button source select stripes, one 20 meter Ethernet cable and a System Control area with two device control sub-sections, switched preview, aux bus delegation and macro controls, with controls for background and keyer source selection, master E-MEM, local E-MEM and horizontal keyer cut/mix. Optional Aux Panel and Menu display sold separately.



GV Korona Control Panels

Our newest control panels, the 1-stripe (1 M/E) 15-button, 2-stripe (2 M/E) 20-button and 3-stripe (3 M/E) 25-button GV Korona bring legendary Grass Valley production power to small and mid-sized studios and trucks. We've addressed space restrictions by innovating, not stripping out functionality.



GV Korona integrates the touchscreen menu into the panel itself, and adds another color touchscreen within the transition area to allow TDs quick access to commonly used functions that used to have dedicated buttons. Being a programmable touchscreen, options are limitless as to what it can do and, of course, we've added a "lock" to the touchscreen for prohibiting any unwanted actions. No other switcher in this space offers such high-end functionality and innovation with the price of a GV Korona.

GV Korona K-Frame Systems

V-series

Out of the box, GV Korona K-Frame V-series provides you with 3G/1080p and 4K UHD (quad-split and 2SI) support capabilities, up to 3 M/Es plus two additional and powerful Video Processing Engines (VPEs) for all the no-compromise mixing and keying power you will ever need. Its native 10-bit 4:2:2 processing even supports High Dynamic Range (HDR).

This is real big switcher performance in a small form factor with a lower CAPEX cost than previously available.

The GV Korona K-Frame V-series processing frame with 16 SDI inputs, 8 SDI outputs and 2x2 Media Ports is capable of expanding to 32x16 SDI and 4x2 Media Ports. Software licenses include 1, 2 or 3 M/Es and two VPEs, each with 4 keys and a mix effects engine, 2D DPMs (resizers) for every keyer, internal 16 GB ImageStore ready to record, store and instantaneously cue and playback over one minute of HD video, two internal multiviewers, two chromakeyers, two analog sync offset reference outputs and FlexiKey for programmable clean feeds.

With the V-series, you can optionally add many additional features including a larger 32 GB ImageStore, Grass Valley's legendary iDPM capability, up/down/crossconverters with frame syncs, DoubleTake to effectively double the number of M/Es and even IP I/O boards in the future to support your migration to IP.

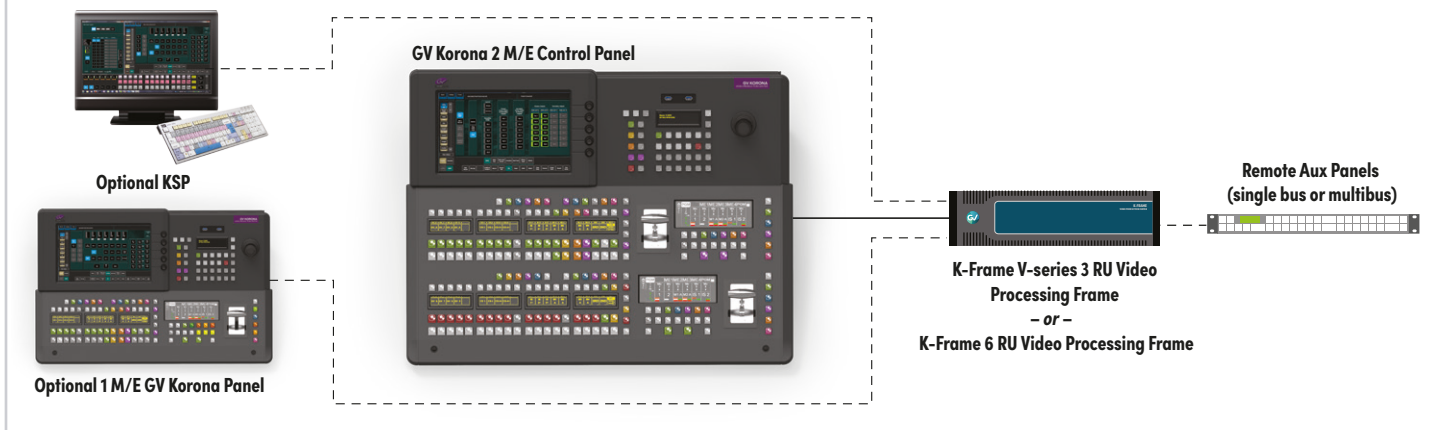
K-Frame XP

Why would you want the smallest K-Frame switcher panel on the largest frame? Many reasons! The suites capabilities of the K-Frame family allows for up to four suites with up to two panels per suite. GV Korona is an ideal panel to use with suites mode, configured with one suite with a Kayenne or Karrera panel for larger productions and a GV Korona panel on another suite for small- to medium-sized productions, back-bench work, home and away production feeds, sub-feeds...producing multiple shows at the same time on the same frame. The Karrera panel's built-in touchscreen menu and transition modules give you flexibility in a compact form factor with proven workflows and simplified control of complex productions. With 1, 2 or 3 stripes, each of which can be assigned to different M/Es or as E-MEM or Macro control, means you have a great deal of power in a small footprint.

GV Korona Control Panel Features In Depth

- Fully integrated multitouch menu system and innovative touchscreen in transition area
- Same familiar user interface and power as Karrera, but in a smaller form factor
- Compatibility with all K-Frame series frames – can be deployed as a second control panel for large events or as the main control panel for GV K-Frame CS X
- Just like any K-Frame switcher, the ability to load shows from Kayenne or Karrera show files

GV Korona System Setup Options



GV Korona Ordering

Select a System

Choose a PRO, ELITE or
EXTREME XP Performance
Suite if desired

Customize with
Options as needed

XP Performance Suites

PRO:

Nomenclature: K-FRM-PRO-XP-PS

- ImageStore with license to enable 32 GB of storage
- License to enable two chromakeyers
- FlexiKey license for programmable clean feed
- License to enable two iDPMs (requires purchase of (1) K-FRM-DPM-XP board)

ELITE:

Nomenclature: K-FRM-ELITE-XP-PS

- ImageStore with license to enable 64 GB of storage
- License to enable all chromakeyers
- FlexiKey license for programmable clean feed
- License to enable eight iDPMs (requires purchase of (1) K-FRM-DPM-XP board)
- License to enable DoubleTake

XTREME:

Nomenclature: K-FRM-XTREME-XP-PS

- ImageStore with license to enable 128 GB of storage
- License to enable all chromakeyers
- FlexiKey license for programmable clean feed
- License to enable ALL iDPMs (requires purchase of (2) K-FRM-DPM-XP boards)
- License to enable DoubleTake

GV Korona Panel Options

KOR-PNL-100-15

1-stripe (1 M/E) GV Korona panel including redundant power supply, with 15-button source selectors.

Includes one 15-button source select stripe, one 20 meter Ethernet cable, and a system control area with device control, switched preview, alternate bus and aux bus delegation, and macro controls, with controls for background and keyer source selection, multi-function and E-MEM area, horizontal keyer cut/mix, multi-function keypad and display. Includes built-in multitouch display and menu system.

KOR-PNL-200-20

2-stripe (2 M/E) GV Korona panel including redundant power supply, with 20-button source selectors.

Includes two 20-button source select stripes, one 20 meter Ethernet cable, and a system control area with device control, switched preview, alternate bus and aux bus delegation, and macro controls, with controls for background and keyer source selection, multi-function and E-MEM area, horizontal keyer cut/mix, multi-function keypad and display. Includes built-in multitouch display and menu system.

KOR-PNL-300-25

3-stripe (3 M/E) GV Korona panel including redundant power supply, with 25-button source selectors.

Includes three 25-button source select stripes, one 20 meter Ethernet cable, and a system control area with device control, switched preview, alternate bus and aux bus delegation, and macro controls, with controls for background and keyer source selection, multi-function and E-MEM area, horizontal keyer cut/mix, multi-function keypad and display. Includes built-in multitouch display and menu system.

KOR-2-20-2M-CXP



GV Korona K-Frame CXP Systems

KOR-2-20-2M-CXP

GV Korona K-Frame CXP SDI 2 M/E system. Includes control panel, video frame and licenses

2-stripe (2 M/E) GV Korona panel (KOR-PNL-200-20) with built-in multitouch touchscreen menu

GV K-Frame XP – Compact 8 RU (K-FRM-100CXP) which includes:

- One XP Controller module (K-FRM-CTRL-CXP) with onboard ImageStore
- One Video Processing Engine module (K-FRM-VPE-XP)
- Two power supplies (K-FRM-PSU-XP)

Software licenses which include:

- Two M/E licenses (K-FRM-LIC-ME)
- 12 2D DPMs with perspective (K-FRM-LIC-2DDPM-XP)

KOR-2-20-2M-CXP includes:

- 32x16 I/O SDI footprint comprised of two I/O modules (K-FRM-IO-FULL-X-GB)

KOR-2-20-2M-CXP-I includes:

- 32x16 I/O IP footprint comprised of two I/O modules (K-FRM-IO-FULL-X-I)

SFP connectors support 25 GbE

SFPs must be ordered separately (K-FRM-IO-SFP10-25G)

KOR-3-25-3M-CXP

GV Korona K-Frame CXP SDI 3 M/E system. Includes control panel, video frame and licenses

3-stripe (2 M/E) GV Korona panel (KOR-PNL-300-25) with built-in multitouch touchscreen menu

GV K-Frame XP – Compact 8 RU (K-FRM-100CXP) which includes:

- One XP Controller module (K-FRM-CTRL-CXP) with onboard ImageStore
- One Video Processing Engine module (K-FRM-VPE-XP)
- Two Power supplies (K-FRM-PSU-XP)

Software licenses which include:

- Three M/E licenses (K-FRM-LIC-ME)
- 18 2D DPMs with perspective (K-FRM-LIC-2DDPM-XP)

KOR-3-25-3M-CXP includes:

- 32x16 I/O SDI footprint comprised of two I/O modules (K-FRM-IO-FULL-X-GB)

KOR-2-20-2M-CXP-I includes:

- 32x16 I/O IP footprint comprised of two I/O modules (K-FRM-IO-FULL-X-I)

SFP connectors support 25 GbE

SFPs must be ordered separately (K-FRM-IO-SFP10-25G)



KOR-3-35-3M-CXP



Select a System

Customize with
Options as needed

V-series systems come with additional licenses that provide tremendous value and can be seen below:

System	M/Es	Stripes	Buttons	Frame Type	Inputs	Outputs
KOR-1-15-1M-KV	1 (plus 2 VPEs)*	1	15	V-series	16 (plus 2 Media Ports) ^{*2}	8 (plus 2 Media Ports) ^{*3}
KOR-2-20-2M-KV	2 (plus 2 VPEs)*	2	20	V-series	16 (plus 2 Media Ports) ^{*2}	8 (plus 2 Media Ports) ^{*3}
KOR-3-25-3M-KV	3 (plus 2 VPEs)*	3	25	V-series	16 (plus 2 Media Ports) ^{*2}	8 (plus 2 Media Ports) ^{*3}

* V-series frames support up to 3 M/Es

^{*2} V-series frames support up to 36 inputs

^{*3} V-series frames support up to 18 outputs

GV Korona Panel Options

KOR-PNL-100-15

1-stripe (1 M/E) GV Korona panel including redundant power supply, with 15-button source selectors.

Includes one 15-button source select stripe, one 20 meter Ethernet cable, and a system control area with device control, switched preview, alternate bus and aux bus delegation, and macro controls, with controls for background and keyer source selection, multi-function and E-MEM area, horizontal keyer cut/mix, multifunction keypad and display. Includes built-in multitouch display and menu system.

KOR-PNL-200-20

2-stripe (2 M/E) GV Korona panel including redundant power supply, with 20-button source selectors.

Includes two 20-button source select stripes, one 20 meter Ethernet cable, and a system control area with device control, switched preview, alternate bus and aux bus delegation, and macro controls, with controls for background and keyer source selection, multi-function and E-MEM area, horizontal keyer cut/mix, multifunction keypad and display. Includes built-in multitouch display and menu system.

KOR-PNL-300-25

3-stripe (3 M/E) GV Korona panel including redundant power supply, with 25-button source selectors.

Includes two 25-button source select stripes, one 20 meter Ethernet cable, and a system control area with device control, switched preview, alternate bus and aux bus delegation, and macro controls, with controls for background and keyer source selection, multi-function and E-MEM area, horizontal keyer cut/mix, multifunction keypad and display. Includes built-in multitouch display and menu system.

GV Korona K-Frame V-series Systems

KOR-1-15-1M-KV

GV Korona K-Frame V-series 1 M/E 15-button system includes control panel, video frame and licenses

1-stripe (1 M/E) GV Korona panel KOR-PNL-100-15 with built-in multitouch touchscreen menu

Compact (3 RU) K-Frame V-series video processing frame (K-FRM-100V) which includes:

- V-series Controller module (K-FRM-CTRL-V) with internal ImageStore
- One V-series Mix/Effects module (K-FRM-ME-V) with multiviewers
- Two input/output modules each with 8 inputs and 4 outputs (K-FRM-IO-STND-V)
- One power supply (K-FRM-PSU-V)

Software licenses include:

- One V-series M/E with four keys (K-FRM-LIC-ME-V)
- Two floating Chromakeyers (K-FRM-LIC-CHRO-2)
- 12 2D DPMs (K-FRM-LIC-2DDPM), 4 assigned to 1 M/E-V and 8 assigned to 2 VPEs
- Internal ImageStore with 16 GB storage (K-FRM-LIC-IMG-16GB)
- “Movies” or RAM Record mode with audio for ImageStore (K-FRM-LIC-IMG-RAMR)
- Two internal multiviewers (K-FRM-LIC-MLTVWR)
- FlexiKey functionality (K-FRM-LIC-FLEX)

KOR-2-20-2M-KV

GV Korona K-Frame V-series 2 M/E 20-button system includes control panel, video frame and licenses

2-stripe (2 M/E) GV Korona panel KOR-PNL-200-20 with built-in multitouch touchscreen menu

Compact (3 RU) K-Frame V-series video processing frame (K-FRM-100V) which includes:

- V-series Controller module (K-FRM-CTRL-V) with internal ImageStore
- One V-series Mix/Effects module (K-FRM-ME-V) with multiviewers
- Two input/output modules each with 8 inputs and 4 outputs (K-FRM-IO-STND-V)
- One power supply (K-FRM-PSU-V)

Software licenses, which include:

- Two V-series M/Es each with four keys (K-FRM-LIC-ME-V)
- Two floating Chromakeyers (K-FRM-LIC-CHRO-2)
- 16 2D DPMs (K-FRM-LIC-2DDPM), 8 assigned to 2 M/E-Vs and 8 assigned to 2 VPEs
- Internal ImageStore with 16 GB storage (K-FRM-LIC-IMG-16GB)
- “Movies” or RAM Record mode with audio for ImageStore (K-FRM-LIC-IMG-RAMR)
- Two internal multiviewers (K-FRM-LIC-MLTVWR)
- FlexiKey functionality (K-FRM-LIC-FLEX)



GV Korona Ordering (cont.)



KOR-3-25-3M-KV



KOR-3-25-3M-KV

GV Korona K-Frame V-series 3 M/E 25-button system includes control panel, video frame and licenses 3-stripe (3 M/E) GV Korona panel KOR-PNL-300-25 with built-in multitouch touchscreen menu Compact (3 RU) K-Frame V-series video processing frame (K-FRM-100V) which includes:

- V-series Controller module (K-FRM-CTRL-V) with internal ImageStore
- One V-series Mix/Effects module (K-FRM-ME-V) with multiviewers
- Two input/output modules each with 8 inputs and 4 outputs (K-FRM-IO-STND-V)
- One power supply (K-FRM-PSU-V)

Software licenses, which include:

- Three V-series M/Es each with four keys (K-FRM-LIC-ME-V)
- Three floating Chromakeyers (K-FRM-LIC-CHRO-2)
- 20 2D DPMs (K-FRM-LIC-2DDPM), 12 assigned to 2 M/E-Vs and 8 assigned to 2 VPEs
- Internal ImageStore with 16 GB storage (K-FRM-LIC-IMG-16GB)
- “Movies” or RAM Record mode with audio for ImageStore (K-FRM-LIC-IMG-RAMR)
- Two internal multiviewers (K-FRM-LIC-MLTVWR)
- FlexiKey functionality (K-FRM-LIC-FLEX)

Kayenne/Karrera/GV Korona À la carte Ordering

1. Choose the desired K-Frame video processing frame. See description above for what comes with a frame.
 - XP Standard: K-FRM-100SXP
 - XP Compact: K-FRM-100CXP
 - V-series: K-FRM-100V
2. Design a panel from the options available, or order one of the standard configurations
3. Add optional hardware to the frame: inputs; outputs; or smart I/O for up/down/crossconversion; ImageStore, extra M/E cards
4. Add software licenses as needed. Each M/E that is added needs an enabling license; chromakeyers and DPMs can be added as well

K-Frame XP Ordering

K-Frame XP Frames

K-FRM-100SXP

Standard K-Frame video processor frame (16 RU) plus separate power supply chassis (1 RU). 2160p and 1080p ready. Video processor frame (16 RU). Controller module with on-board licensable ImageStore and multiviewers options, 32 SDI inputs, 16 SDI outputs, 8 GPI in, 32 GPI out, one Mix/Effects module licensable for three M/Es and 2D DPM with perspective, AMP, Ethernet tally, 999 macros, 1,000 E-MEMs, Source Rules, Panel Memory, six keys per M/E, hot-swappable modules, and three power supplies.

K-FRM-100SXP-I

Same as the K-FRM-100SXP but with IP I/O instead of SDI. SFPs (10G or 25G) must be ordered separately.

K-FRM-100CXP

Compact K-Frame video processor frame (8 RU) with internal power supply. 2160p and 1080p ready. Controller module with on-board licensable ImageStore and multiviewers options, 32 inputs, 16 outputs, 8 GPI in, 32 GPI out, one Mix/Effects module licensable for three M/Es and 2D DPM with perspective, AMP, Ethernet tally, 999 macros, 1,000 E-MEMs, Source Rules, Panel Memory, six keys per M/E, hot-swappable modules, and two power supplies.

K-FRM-100CXP-I

Same as the K-FRM-100CXP but with IP I/O. SFPs (10G or 25G) must be ordered separately.

K-Frame XP Hardware Options

K-FRM-100SXP

GV K-Frame XP – Standard (15 RU) SDI-based Video Production Center with (1 RU) external power supply frame is capable of processing in HD, 1080p 3G, and full-raster 4K UHD 2160p with the appropriate license. Maximum I/O footprint 192x96 in HD or 4K UHD 2160p. The frame has a maximum of 9 M/Es with maximum 54 full-function keys.

Includes:

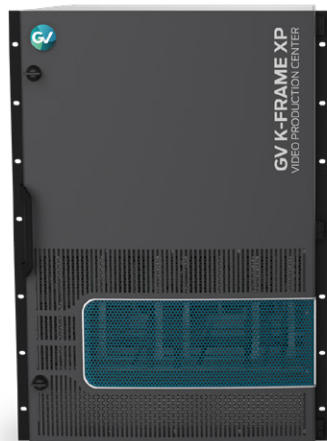
- Three power supplies (K-FRM-PSU-XP)
- One XP Standard Controller Processor module (K-FRM-CTRL-SXP) with on-board ImageStore, requires a license
- 32 SDI inputs / 16 SDI dual outputs spanning two K-FRM-IO-FULL-X-GB. I/O capable of 4K UHD 2160p, 3G, and/or 12 GB w/ “gearbox” functionality
- One Video Processing Engine module (K-FRM-VPE-XP) capable of licensing three on-board processors as either M/E, eDPM or multiviewer

M/E includes:

- 18 inputs – A/B/C/D backgrounds, 1/2 Utility, 6 Video/Key Pairs
- 7 outputs – Program A, B, C, D; Preview A, C; Optional M/E view
- 6 full-function keys with two pages of V/K store
- Licensable 2D DPMs with perspective on each Keyer (K-FRM-LIC-2DDPM-XP)
- Cut, Mix, and Wipe transitions
- 8 GPI inputs and 8 GPI outputs (max. 16 GPI inputs and 8 GPI outputs), 32 tally outputs (max. 64 Tally outputs)
- 999 Macros, 1000 E-MEMs, Machine Control (Serial and Ethernet)

Software licenses include:

- One Mix/Effect license (K-FRM-LIC-ME) enables one M/E on the VPE module



K-Frame XP Ordering (cont.)

K-FRM-100SXP-I

32x16 I/O IP footprint comprised of two I/O modules (K-FRM-IO-FULL-X-I)

- SFP connectors support 25 GbE
- SFPs must be ordered separately (K-FRM-IO-SFP10-25G)

K-FRM-100CXP

GV K-Frame XP – Compact (8 RU) SDI-based Video Production Center with internal power supplies is capable of processing in HD, 1080p 3G, and full-raster 4K UHD 2160p with the appropriate license.

The frame has a maximum of six (6) M/Es with maximum thirty-six (36) full-function keyers.

Maximum I/O footprint 80x40 in HD or 4K UHD 2160p. Includes:

- Two Power supplies (K-FRM-PSU-XP)
- One XP Compact Controller Processor module (K-FRM-CTRL-CXP) with on-board ImageStore, requires a license
- 32 SDI inputs / 16 SDI dual outputs spanning two K-FRM-IO-FULL-X-GB. I/O capable of 4K UHD 2160p, 3G, and/or 12 GB w/ "gearbox" functionality
- One Video Processing Engine module (K-FRM-VPE-XP) capable of licensing three on-board processors as either M/E, eDPM or multiviewer

M/E includes:

- 18 inputs – A/B/C/D backgrounds, 1/2 Utility, Six Video/Key Pair
- 7 outputs – Program A, B, C, D; Preview A, C; optional M/E view
- 6 full-function keyers with two pages of V/K store
- One Mix/Effect license (K-FRM-LIC-ME) enables one M/E on the VPE module
- 8 GPI inputs and 8 GPI outputs (max. 16 GPI inputs and 8 GPI outputs), 32 tally outputs (max. 64 Tally outputs) 999 Macros, 1000 E-MEMs, Machine Control (Serial and Ethernet)
- Cut, Mix, and Wipe transitions. Licensable option available for 2D DPMs with perspective on each Keyer (K-FRM-LIC-2DDPM-XP).

Software licenses include:

- One Mix/Effect license (K-FRM-LIC-ME) enables one M/E on the VPE module

K-FRM-100CXP-I

Same as the K-FRM-100CXP but with IP I/O (K-FRM-IO-FULL-X-I) instead of SDI. SFPs (10 GbE or 25 GbE) must be ordered separately.

K-FRM-CTRL-CXP

GV K-Frame XP – Compact Controller Processor module for K-FRM-100CXP (-I) enabling processing in full-raster 4K UHD 2160p, 1080p 3G and HD. The internal ImageStore functionality resides on-board with eight channel pairs of V&K for stills and movies with audio. ImageStore storage capacity up to 128 GB and movies requires licenses.

K-FRM-CTRL-SXP

GV K-Frame XP – Standard Controller Processor module for K-FRM-100SXP (-I) enabling processing in full-raster 4K UHD 2160p, 1080p 3G and HD. The internal ImageStore functionality resides on-board with eight channel pairs of V&K for stills and movies with audio. ImageStore storage capacity up to 128 GB and movies requires licenses.

K-FRM-100CXP-KIT

GV K-Frame XP – Compact (8 RU) Video Production Center Spares Kit includes: Control Processor module (K-FRM-CTRL-CXP) and fan module.

K-FRM-100SXP-KIT

GV K-Frame XP – Standard (15 RU) Video Production Center Spares Kit includes: Control Processor module (K-FRM-CTRL-SXP) and fan module.

K-FRM-PSU-XP

K-Frame XP power supply for redundancy, replacement or spares on K-FRM-100CXP.

K-FRM-PSU-FRAME

Power supply frame, holds up to three power supply modules. Includes two power supply unit modules

K-FRM-PSU

K-Frame Power Supply for the K-FRM-PSU-FRAME

KAL-32AUXx

Single and multibus remote aux panels

K-Frame XP Software Options

K-FRM-LIC-12G-SXP

K-Frame software license enabling 12G (full-raster 4K UHD 2160p) and 3G 1080p formats in the GV K-Frame XP – Standard (K-FRM-100SXP or K-FRM-100SXP-I). Order under switcher configuration or under K-FRM-SW-OPT, include frame serial number.

K-FRM-LIC-12G-CXP

K-Frame software license enabling 12G (full-raster 4K UHD 2160p) and 3G 1080p formats in the GV K-Frame XP – Compact (K-FRM-100CXP or K-FRM-100CXP-I). Order under switcher configuration or under K-FRM-SW-OPT, include frame serial number.

K-FRM-LIC-ME

Software license enabling mix/effects functionality on the K-FRM-ME/DPM Module. Six keyers per M/E. One license required for every M/E.

K-FRM-LIC-ME-VIEW

Software license enabling the capability to view an additional preview output from the M/E that displays the input videos for that M/E. Six pre-configured layouts that are separately selectable for each M/E.

K-FRM-LIC-EDPM

Software license enabling M/E hardware to act as either an M/E or an expansion Digital Picture Manipulator (eDPM) for grouping up to six licensed DPMs video and key channels. Includes Kurl with nonlinear transforms including page-turn, page-roll, spheres, ripple, slits, mirrors, splits, size modulation and position modulation, plus Spektra with lighting, wide-range defocus, glow and output recursives.

K-FRM-LIC-IDPM-2

Software license enabling two of the available floating iDPM Digital Picture Manipulator video and key channels. Includes Kurl with nonlinear transforms including page-turn, page-roll, spheres, ripple, slits, mirrors, splits, size modulation and position modulation, plus Spektra with lighting, wide-range defocus, glow and output recursives.

K-FRM-LIC-IDPM-ALL

Software license enabling all of the available floating iDPM video and key channels. Includes Kurl with nonlinear transforms including page-turn, page-roll, spheres, ripple, slits, mirrors, splits, size modulation and position modulation, plus Spektra with lighting, wide-range defocus, glow and output recursives.

K-FRM-LIC-2DDPM-XP

Software license for the K-Frame SXP and CXP, enabling ALL 2D DPMs with perspective available on licensed M/Es. Can only be licensed on GV K-Frame XP systems. Order under switcher configuration or under K-FRM-SW-OPT.

K-FRM-LIC-CHRO-2

Software license enabling two floating chromakeyers to use on any of the six keyers on every M/E.

K-FRM-LIC-CHRO-ALL

Software license enabling all chromakeyers on all keyers. Possible 36 chromakeyers in a fully loaded CXP frame and 54 in a fully loaded SXP frame.

K-FRM-LIC-FLEX

Software license enabling FlexiKey programmable clean feed.

K-FRM-LIC-RGB

Software license for RGB color correctors on every M/E bus, with color correction per input and on all outputs.

K-FRM-LIC-DBL

Software license enabling DoubleTake (aux bus transitions, etc.) split M/E.

K-FRM-LIC-MLTVWR

Software license enabling multiviewer functionality on the K-FRM-ME-DPM module. One license required for every multiviewer. Maximum licenses dependent on hardware availability. Five pre-configured layouts, max. 16 panes per layout with On-Air and Preview tally.

K-FRM-LIC-IMG-RAMR

Software license enabling the ImageStore board to operate in "Movies" RAM Record mode. Requires a K-FRM-IMG and a K-FRM-LIC-IMG-xx.

K-FRM-LIC-SNMP

Software license enabling the SNMP MIB functions to be used by various SNMP health monitoring systems.

K-Frame XP Ordering (cont.)

XP Performance Suites

K-FRM-PRO-XP-PS

GV K-Frame XP PRO Performance Suite software includes:

- One K-FRM-LIC-IMG-32GB
- One K-FRM-LIC-IDPM-2, requires purchase of K-FRM-DPM-XP module
- One K-FRM-LIC-CHRO-2
- One K-FRM-LIC-FLEX

Only available for GV K-Frame XP systems. Order under switcher configuration or under K-FRM-SW-OPT.

K-FRM-ELITE-XP-PS

GV K-Frame XP ELITE Performance Suite software includes:

- One K-FRM-LIC-IMG-64GB
- One K-FRM-LIC-IDPM-8, requires purchase of K-FRM-DPM-XP module
- One K-FRM-LIC-CHRO-ALL
- One K-FRM-LIC-FLEX
- One K-FRM-LIC-DBL

Only available for GV K-Frame XP systems. Order under switcher configuration or under K-FRM-SW-OPT.

K-FRM-XTREME-XP-PS

GV K-Frame XP XTREME Performance Suite software includes:

- One K-FRM-LIC-IMG-128GB
- One K-FRM-LIC-IDPM-ALL, requires purchase of K-FRM-DPM-XP module
- One K-FRM-LIC-CHRO-ALL
- One K-FRM-LIC-FLEX
- One K-FRM-LIC-DBL

Only available for GV K-Frame XP systems. Order under switcher configuration or under K-FRM-SW-OPT.

K-Frame V-series Ordering

K-Frame V-series Frames

K-FRM-100V

K-Frame 3G-ready video processor frame with Controller module with on-board licensable ImageStore options, 16 SDI and 2 Media Port inputs, 8 SDI and 2 Media Port outputs, 8 GPI in, 32 GPI out, one Mix/Effects module licensable for five M/Es and multiviewer options, AMP, Ethernet tally, 999 macros, 1,000 E-MEMs, Source Rules, Panel Memory, four keyers per M/E, hot-swappable modules, and internal power supplies.

K-Frame V-series Hardware Options

K-FRM-100V

K-Frame V-series (3 RU) video processing frame with internal power supply includes:

- V-series Controller module (K-FRM-CTRL-V)
- One V-series Mix/Effects module (K-FRM-ME-V)
- Two Input/Output modules (K-FRM-IO-STND-V)
- Two additional Media Port outputs
- One Power supply (K-FRM-PSU-V)
- 8 GPI inputs, 8 GPI outputs, and 24 tally connections
- AMP protocol
- Ethernet tally
- 999 Macros and 1000 E-MEMs

Video frame has six VPEs each with fourkeyer capability and a slot for optional DPM module; 36 inputs/18 outputs maximum.

K-FRM-CTRL-V

K-Frame V-series Controller Processor module. The internal ImageStore functionality resides on this module, which is licensable

K-FRM-100V-KIT

K-Frame V-series Spares Kit includes:

- V-series Control Processor (K-FRM-CTRL-V)
- V-series Fan Assembly

K-FRM-DPM-V

K-Frame V-series DPM Module adds iDPM capability to V-series that supports:

- Four (4) licensed V/K channels of iDPM available as floating iDPMs or assignable to eDPM
- Includes the enabling DPM software license (K-FRM-LIC-IDPM-ALL)

K-FRM-ME-V

K-Frame V-series Mix/Effects Module with five (5) Video Processing Engines (VPE) that can be utilized as M/Es or VPEs. One module per frame:

V-series M/Es (K-FRM-LIC-ME-V):

- A/B and Utility 1 and 2 backgrounds
- Four (4) full-function keyers with 2D DPMs
- Cut/Mix/Wipe transitions
- Six (6) program, preview, and clean feed outputs

Two (2) licensable multiviewers (K-FRM-LIC-MLTVWR)

K-FRM-IO-STND-V

K-Frame V-series Input/Output Module, adds 8 SDI inputs (plus 1 Media Port input) and 4 SDI outputs

K-FRM-IO-CONV-V

K-Frame V-series Input/Output with Conversion Module, adds 8 SDI inputs (plus 1 Media Port input) and 4 SDI outputs with 12 licensable video up/down/cross-converters. Requires one K-FRM-LIC-SETM-V license per module. (Supports conversion between SD, HD, 1080p and quad-link 4K UHD 2SI or SDQS.)

K-FRM-PSU-V

K-Frame V-series Power Supply, for replacement or spares

K-Frame V-series Software Options

K-FRM-LIC-3G-V

Software license enabling 3G formats and EZ-4K in the K-FRM100V video processing frame. For previously shipped systems, order under K-FRM-SW-OPT configuration and include frame serial number.

K-FRM-LIC-ME-V

Software license enabling M/E functionality on K-Frame V-series Mix/Effects module.

One license required for every M/E:

- A/B and Utility 1 and 2 backgrounds
- Four full-function keyers with 2D DPMs
- Cut/Mix/Wipe transitions
- Six program, preview, and clean feed outputs

Six M/E licenses maximum on a K-FRM-ME-V module

K-FRM-LIC-SETM-V

Software license enabling all of the SetDef/MatchDef video format converters on the K-FRM-IO-CONV-V cards for up, down, and cross converting inputs and outputs of SD and HD including 1080p. Modular input/output module(s) (K-FRM-IO-CONV-V) are required for SETMATCH software option. For previously shipped systems order under K-FRM-SW-OPT configuration and include frame serial number. (Supports conversion between SD, HD, 1080p and quad-link UHD 2SI or SDQS.)

K-FRM-LIC-2DDPM

Software license for the K-Frame V-series, enabling ALL 2D DPMs available on licensed M/Es in the video processor frame. For previously shipped systems order under K-FRM-SW-OPT configuration and include frame serial number.

K-FRM-LIC-ME-VIEW

Software license enabling the capability to view an additional preview output from the M/E that displays the input videos for that M/E. Six pre-configured layouts that are separately selectable for each M/E.

K-FRM-LIC-CHRO-ALL

Software license enabling all chromakeyers on all keyers. Possible 30 chromakeyers in a fully loaded V-series frame.

K-FRM-LIC-MLTVWR

Software license enabling multiviewer functionality on the K-FRM-ME-DPM module. One license required for every multiviewer. Maximum licenses dependent on hardware availability. Five pre-configured layouts, max. 14 panes per layout with On-Air and Preview tally.

K-FRM-LIC-IMG-RAMR

Software license enabling the ImageStore board to operate in "Movies" RAM Record mode. Requires a K-FRM-IMG and a K-FRM-LIC-IMG-xx.

K-FRM-LIC-SNMP

Software license enabling the SNMP MIB functions to be used by various SNMP health monitoring systems.

Control Panel Options

Kayenne Options

KAYN-PNL-OPT-DCM

Device control module option for an option slot in the main panel or in a satellite panel enclosure. Used for controlling various image record and playback devices with full motion control features and a jog knob.

KAYN-PNL-SAT-x

Satellite panel enclosure for remote mounting panel modules separate from the main panel up to 15 meters from the panel control unit. (x = 1 or 2 for the number of modules the enclosure supports)

KAYN-PNL-MENU

Touchscreen menu panel and cable, as additional menu connected to second CPU (requires KAYN-PNL-CPU2), or standalone connected to customer furnished PC or as a spare.

KAYN-PNL-PSU

Spare power supply for the panel control unit.

KAYN-PNL-SBAR-X

Kayenne control panel System Bar Module(s) with macro and switched preview control buttons, and either two or four device controllers.

KAYN-PNL-CPU2

CPU module for connecting a second menu panel to one panel control unit.

Karrera Options

KRR-PNL-MENU-SET

Touchscreen menu panel set, for a complete menu panel configuration with a Karrera main control panel. Includes menu panel, menu CPU, menu power supply, swing arm mounting hardware for menu panel and menu CPU, 20 meter LAN cable, DVI cable, USB cable and power cables.

KRR-PNL-AUX-25

Optional 25-button local aux bus control panel for the Karrera panel series. Includes the power cable and short LAN cable.

KRR-PNL-AUX-35

Optional 35-button local aux bus control panel for the Karrera panel series. Includes the power cable and short LAN cable.

KRR-PNL-LAN-20

20-meter LAN cable for the Karrera main control panel or menu panel PC to the video processor frame, for replacements or spares.

GV Korona Options

KOR-PNL-KIT

GV Korona critical spares kit for the KOR-PNL-xxx-xx main control panel models, including the controller board.

KOR-PNL-PSU

GV Korona power supply unit, for replacement or spares.

KOR-PNL-LAN-20

20-meter LAN cable for the GV Korona main control panel to the video processor frame, for replacement or spares.

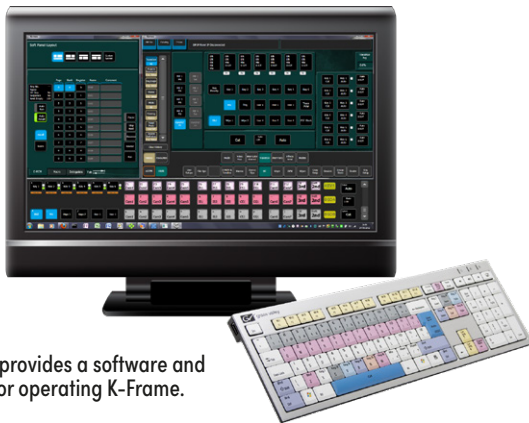
KSP Control Surface

KSP-PNL-1ME-KBD

Soft panel interface keyboard for 1 M/E GUI with special Keypcap labels and colors for switcher control. Requires the KSP-LIC-1ME-SW software option to operate the KSP.

KSP-LIC-1ME-SW

License enabling control of the K-Frame series video processor frames with the 1 M/E soft panel GUI on a customer supplied PC. Suggest the KSP-PNL-1ME-KBD option.



KSP Control Surface provides a software and keyboard option for operating K-Frame.



Panel Control Unit (KAYN-PNL-PCU)



Touchscreen Menu Panel (KAYN-PNL-MENU)

Specifications

Mechanical Specifications

For complete product dimensions and installation instructions, please refer to the documentation library at www.grassvalley.com.

Component	Depth	Width	Height	Weight	Rack Units
Kayenne Control Panels					
Flat Support Structure Orientation					
KAYN-PNL-200-25	488.4 mm (19.23 in.)	1341.7 mm (52.82 in.)	84.3 mm (3.32 in.)	29.9 kg (65.8 lbs.)	n/a
KAYN-PNL-200-35	488.4 mm (19.23 in.)	1533.7 mm (60.38 in.)	84.3 mm (3.32 in.)		n/a
KAYN-PNL-300-25	637.1 mm (25.08 in.)	1341.7 mm (52.82 in.)	84.3 mm (3.32 in.)		n/a
KAYN-PNL-300-35	637.1 mm (25.08 in.)	1533.7 mm (60.38 in.)	84.3 mm (3.32 in.)	44.7 kg (98.4 lbs.)	n/a
KAYN-PNL-400-25	746.3 mm (29.38 in.)	1341.7 mm (52.82 in.)	84.3 mm (3.32 in.)		n/a
KAYN-PNL-400-35	746.3 mm (29.38 in.)	1533.7 mm (60.38 in.)	84.3 mm (3.32 in.)	57.3 kg (126.2 lbs.)	n/a
KAYN-PNL-AUX-25	185.7 mm (7.31 in.)	621.7 mm (24.48 in.)	84.3 mm (3.32 in.)	6.1 kg (13.4 lbs.)	n/a
KAYN-PNL-AUX-35	185.7 mm (7.31 in.)	813.7 mm (32.04 in.)	84.3 mm (3.32 in.)	6.3 kg (13.8 lbs.)	n/a
KAYN-PNL-MENU	91.7 mm (3.61 in.)	417.85 mm (16.45 in.)	270.10 mm (10.63 in.)	6.2 kg (13.5 lbs)	n/a
Kayenne PCU					
KAYN-PNL-PCU	588.52 mm (23.17 in.)	482.60 mm (19 in.)	133.35 mm (5.25 in.)	16.06 kg (35.4 lbs.)	3
Karrera Control Panels					
KRR-PNL-200-25-C	510 mm (20.08 in.)	1010 mm (39.77 in.)	178 mm (7.01 in.)	18.71 kg (41.25 lbs.)	n/a
KRR-PNL-300-35	510 mm (20.08 in.)	1440.6 mm (56.72 in.)	178 mm (7.01 in.)	28.28 kg (62.4 lbs.)	n/a
KRR-PNL-AUX-25	162 mm (6.38 in.)	610 mm (24.02 in.)	76 mm (3.00 in.)	3.07 kg (6.75 lbs.)	n/a
KRR-PNL-AUX-35	162 mm (6.38 in.)	800 mm (31.50 in.)	76 mm (3.00 in.)	4.08 kg (9.0 lbs.)	n/a
GV Korona Control Panels					
KOR-PNL-100-15	419.8 mm (16.5 in.)	668.5 mm (26.3 in.)	236.2 mm (9.3 in.) ^{*1}	12.3 kg (27.1 lbs.)	n/a
KOR-PNL-200-20	576.5 mm (22.7 in.)	764.5 mm (30.1 in.)	261.6 mm (10.3 in.) ^{*1}	17.6 kg (38.7 lbs.)	n/a
KOR-PNL-300-25	736.6 mm (29.0 in.)	861 mm (33.9 in.)	287 mm (11.3 in.) ^{*1}	27.9 kg (61.4 lbs.)	n/a
Frames					
K-FRM-SXP	604 mm (23.76 in.)	483 mm (19.00 in.)	662 mm (26.22 in.)	58.3 kg (128.6 lbs.)	15
K-FRM-SXP-I	604 mm (23.76 in.)	483 mm (19.00 in.)	662 mm (26.22 in.)	57.7 kg (127.3 lbs)	15
K-FRM-PSU	584 mm (23.0 in.)	483 mm (19.0 in.)	440 mm (1.75 in.)	7.3 kg (16.0 lbs.) (empty) 16.0 kg (35.4 lbs.) (with 4 power supplies)	1
K-FRM-CXP	632 mm (25.90 in.)	483 mm (19.0 in.)	345 mm (13.97 in.)	59.7 kg ^{*2} (125 lbs.)	8
K-FRM-100V	563.5 mm (21.2 in.)	482.6 mm (19.0 in.)	132.6 mm (5.2 in.)	28 kg (62 lbs.) (with one power supply)	3

Weights for K-FRM-100V is with fully populated unit.

^{*1} Heights for GV Korona panels include tub rubber feet.

^{*2} Compact frame weight with three power supplies. Each power supply weighs 2.5 kg (5.4 lbs.)

Specifications (cont.)

Frame	M/Es	Inputs	Outputs	GPI Inputs	GPI/Tally Outputs	Mod I/O (MatchDef/SetDef)
K-Frame SXP	1 to 9	192	96	Up to 40 (4 per 16x8 I/O board)	Up to to 40 GPI and 160 Tally (4 GPI Outputs and 16 Tally per 16x8 I/O board)	Up to 4 CONV I/O boards per frame. Each CONV I/O card provides 8 SDI and 1 Media Port input and 4 SDI outputs, all with MatchDef/SetDef capability
K-Frame CXP	1 to 6	80	40	Up to 16 (4 per 16x8 I/O board)	Up to to 16 GPI and 64 Tally (4 GPI Outputs and 16 Tally per 16x8 I/O board)	Up to 2 CONV I/O boards per frame. Each CONV I/O card provides 8 SDI and 1 Media Port input and 4 SDI outputs, all with MatchDef/SetDef capability
V-series 3 RU	1 to 3 plus 2 VPEs	8-32 SDI or IP plus up to 4 Media Ports	4-16 SDI or IP plus 2 Media Ports	8 per frame	32 per frame	Up to 4 CONV I/O boards per frame. Each CONV I/O card provides 8 SDI and 1 Media Port input and 4 SDI outputs, all with MatchDef/SetDef capability

Board Count

K-Frame SXP	Up to 3 M/E boards	Up to ten 16 input x 8 output boards per frame. Plus the Mod I/O boards. Can be mix of SDI GearBox and IP I/O				Up to four 8 input x 4 output modules. Can be mix of SDI Conversion or IP I/O boards
K-Frame CXP	Up to 2 M/E boards	Up to four 16 input x 8 output boards per frame. Plus the Mod I/O boards. Can be mix of SDI GearBox and IP I/O				Up to two 8 input x 4 output modules. Can be mix of SDI Conversion or IP I/O boards
V-series 3 RU	Up to 1 M/E board (5 M/Es per board)	See Mod I/O				Up to four input/output boards (SDI Converter I/O board 8 SDI and 1 Media Port inputs and 4 SDI outputs per board) (IP I/O board 8 inputs and 4 outputs per board)

Video Standards

4K UHD Mode:

- 2160p Full Raster (K-Frame XP only)
- 2-Sample-Interleave (2SI) Quad Link
- Square Division Quad Split (SDQS) Quad Link

3G Mode:

- 1080p 50 Hz SMPTE ST 425-1 section 4 - Level A
- 1080p 59.94 Hz SMPTE ST 425-1 section 4 - Level A
- 1080p 60 Hz SMPTE ST 425-1 section 4 - Level A
- 1080p 50 Hz SMPTE ST 425-1 section 5 - Level B (V-series only)
- 1080p 59.94 Hz SMPTE ST 425-1 section 5 - Level B (V-series only)
- 1080p 60 Hz SMPTE ST 425-1 section 5 - Level B (V-series only)

HD Mode:

- 1080i25/29.97/30
- 1080PsF23.976/24/25/29.97/30
- 720p50/59.94/60

SD Mode:

- 525i29.97
- 625i25

Media Port Inputs & Outputs (V-series only)

SD:

- 720p (1440) x 480i 29.97 Hz
- 720p (1440) x 576i 25 Hz

HD:

- 1280x720p 50/59.94/60 Hz
- 1920x1080i 25/29.97/30 Hz
- 1920x1080p 50/59.94/60 Hz

Serial Digital Video Inputs

Interface:

- 4K 2160p SMPTE 2082-10
- 3G video formats SMPTE ST 424-2006
- HD video formats SMPTE ST 292-1998
- SD video formats SMPTE ST 259-1997 ITU-R BT.656

Return loss:

- >15 dB, 5 MHz to 1.5 GHz
- >10 dB, 1.5 GHz to 3.0 GHz

Type of connector: 75Ω BNC (SMPTE ST 259)

Nominal amplitude: 800 mVp-p terminated

Input impedance: 75Ω

Max. cable length: using Belden 1694A type cable

- 3G video 140m (459 ft.) typical
- HD video 200m (656 ft.) typical
- SD video 350m (1,148 ft.) typical

Serial Digital Video Outputs

Interface:

- 3G video formats SMPTE ST 424-2006
- HD video formats SMPTE ST 292-1998
- SD video formats SMPTE ST 259-1997 ITU-R BT.656

Return loss:

- >15 dB, 5 MHz to 1.5 GHz
- >10 dB, 1.5 GHz to 3.0 GHz

Type of connector: 75Ω BNC (SMPTE ST 259)

Nominal amplitude: 800 mVp-p across 75Ω

Rise and fall times:

- 3G & HD video formats ≤ 135 ps between 20% and 80% amplitude
- SD video formats, 400 to 1400 ps between 20% and 80% amplitude

Timing jitter:

- 3G video formats ≤ 2.0 UI
- HD video formats ≤ 1.0 UI
- SD video formats ≤ 0.2 UI

Alignment jitter:

- 3G video formats ≤ 0.3 UI
- HD video formats ≤ 0.2 UI
- SD video formats ≤ 0.2 UI

Output impedance: 75Ω

DC offset: <500 mV with 75Ω termination

Ancillary and embedded data: blanked or passed (user selectable)

EDH: blanked

Specifications (cont.)

Analog Reference Input

Video standard: Analog Black or Tri-level sync

Return loss: >40 dB, up to 5 MHz

Connectors: 2 BNC loop-through

Impedance: 75Ω external termination

Reference Output (V-series only)

Return loss: >40 dB, 0 to 5 MHz

Nominal amplitude: 1 Vp-p into a 75Ω load

Communications

Connections:

- PCU to video frame: LAN cable 100m (328 ft.) max. length
- Control panel to PCU: dedicated cables, choice of 7.5m or 15m
- Menu panel to PCU: dedicated cables, choice of 7.5m or 15m

Interoperability: The Video Production Centers are interoperable with the Encore, Jupiter, SMS-7000 and NV9000 routing control systems; LDK Series and LDX Series cameras using Connect Gateway; and with the K2 media server family (including the K2 Summit and K2 Solo), legacy Profile servers, M-Series iVDRs, Turbo iDDR and T2 iDDR.

Supported Control Protocols

The Video Production Centers support Ethernet and serial AMP protocol (standard in all systems), serial BVW and Odetics protocols, as well as controlling devices using PBus II and GPIs

- Serial BVW-75 for VTR control
- AMP (advanced media protocol) for Profile PVS, Profile XP Media Platform, K2, M-Series, Turbo iDDR and T2 iDDR systems over Ethernet and serial
- Grass Valley native protocol for routers/routing control systems (Trinix/Trinix NXT, Venus, Triton, NVISION and third-party routers; Jupiter, Encore and NV9000 router control systems)
- Ethernet tally
- Grass Valley remote Aux Panels via Ethernet
- Grass Valley editor protocol for edit controllers and external control
- VDCP Serial and Ethernet
- RossTalk protocol support for direct control of XPression graphics engine
- Direct Control of Chyron Lyric and CrossTalk graphics engines

Power

Video Processing Frame 3 RU:

- Line voltage: 100-240 VAC ±10% power factor corrected with automatic line-voltage sensing for 120V and 240V sources
- Line frequency: 50/60 Hz ±5%
- Power consumption: max. 500W
- Leakage current: <2.5 mA

Video Processing Frame 6 RU:

- Line voltage: 100V-240 VAC ±10% power factor corrected
- Automatic line-voltage sensing for 120V and 240V sources
- Line frequency: 50/60 Hz ±5%
- Power consumption: max. 900W (750W for “S-series” board set)
- Leakage current: <2.5 mA

Video Processing Frame 13 RU:

- Line voltage: 100V-240 VAC ±10% power factor corrected
- Automatic line-voltage sensing for 120V and 240V sources
- Line frequency: 50/60 Hz ±5%
- Power consumption: max. 1400W
- Leakage current: <2.5 mA

Kayenne Control Panel:

- Line voltage: 100V-240 VAC ±10% power factor corrected
- Automatic line-voltage sensing for 120V and 240V sources
- Line frequency: 50/60 Hz ±5%
- Power consumption: max. panel configuration 600W
- Leakage current: <2.5 mA

Karrera Control Panel:

- Line voltage: 100V-240 VAC ±10% power factor corrected
- Automatic line-voltage sensing for 120V and 240V sources
- Line frequency: 50/60 Hz ±5%
- Power consumption: max. 200W
- Leakage current: <2.5 mA

GV Korona Control Panel:

- Line voltage: 100-240 VAC ±10% power factor corrected with automatic line-voltage sensing for 120V and 240V sources
- Line frequency: 50/60 Hz ±5%
- Power consumption: max. 50W
- Leakage current: <2.5 mA

Environmental Conditions

Storage temperature: -20 to 70°C (-4 to 158°F)

Operating temperature: 0 to 40°C (32 to 104°F)

Relative humidity: 0-95% (non-condensing)

Electromagnetic environment: E2 (according to EN55103-1, -2)

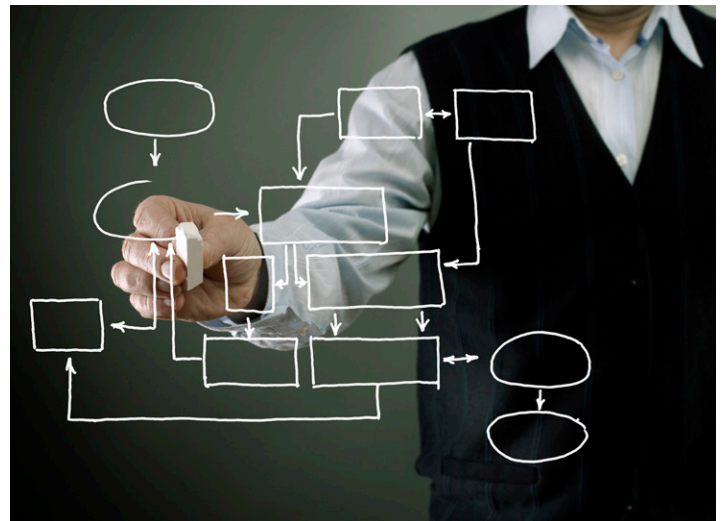


In a world of ever-increasing complexity and system distribution, broadcast producers inside a studio or outside in a vehicle need production control equipment suppliers who can provide industry-leading technical support. Personnel is but one part of the support equation. The other is a business infrastructure capable of deploying and cost-effectively supporting reliable solutions. Grass Valley Global Services has the depth of knowledge, industry experience and technical expertise to achieve this objective. The Global Services portfolio provides everything necessary insure maximum uptime and high velocity problem resolution.

Grass Valley Global Services delivers a comprehensive array of tangible value:

- A global network of field engineers with the experience, knowledge and skill to keep production switchers/ vision mixers and associated equipment up to date, operational and optimized
- A worldwide parts distribution system that ensures rapid access to replacement parts
- A team of educators skilled in the nuances of production control and switcher operations
- Technical and operational training, provided on-site at Grass Valley facilities worldwide and online, that maximizes productivity through tailored learning paths
- Comprehensive support agreements that ensure every Grass Valley system remains in peak condition – all while supporting the enterprise’s need for financial predictability

Grass Valley Global Services offerings deliver tangible value. The Global Services organization does this by providing the resources to ensure that users get the maximum value from an investment in Grass Valley production switchers – from initial startup through the entire in-service lifespan. Global Services empowers users to meet tactical day-to-day objectives while giving staff more time to focus on strategic business initiatives. A global presence, logistics expertise and world-renowned team of media professionals are here to help the achievement of financial performance objectives by reducing risk while boosting operational efficiencies.



Global Services Provides:

- Unequaled depth of industry knowledge and technical expertise
- Over 50 years of worldwide experience
- Complete set of services:
 - Strategic advice
 - System architecture
 - Workflow analysis and design
 - Project management
 - Integration and implementation
 - Performance optimization
 - Technical and operational training
 - Educational services
- Address today’s challenges and prepare for tomorrow’s opportunities

This product may be protected by one or more patents. For further information, please visit: www.grassvalley.com/patents

DS-PUB-3-0572C-EN

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